BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

THE PREMCOR REFINING GROUP, INC.)		
	)	
Petitioner,	)	
	)	PCB 2026-050
v.	)	(Permit Appeal – RCRA)
	)	
ILLINOIS ENVIRONMENTAL	)	
PROTECTION AGENCY,	)	
	)	
Respondent.	)	

NOTICE OF FILING

TO: Mr. Don A. Brown**,**
Clerk of the Board
Illinois Pollution Control Board
60 E Van Buren Street, Suite 630
Chicago, Illinois 60605

VIA ELECTRONIC MAIL)

(SEE PERSONS ON ATTACHED SERVICE LIST)

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Illinois Pollution Control Board, **ENTRY OF APPEARANCE OF MELISSA S. BROWN and PETITION FOR REVIEW OF FINAL DECISION** on behalf of The Premcor Refining Group Inc., copies of which are hereby served upon you.

Respectfully submitted,

The Premcor Refining Group, Inc.

Dated: July 6, 2026

By: /s/ *Melissa S. Brown*
One of its Attorneys

Melissa S. Brown
HEPLERBROOM, LLC
4340 Acer Grove Drive
Springfield, Illinois 62711
Phone: 217-528-3674
Melissa.Brown@heplerbroom.com

CERTIFICATE OF SERVICE

I, the undersigned, on oath state the following: That I have caused to be served the attached: **Entry of Appearance of Melissa S. Brown and Petition for Review of Final Decision,** on July 6, 2026 to the following:

Don Brown
Clerk of the Board
Illinois Pollution Board
60 E Van Buren Street, Suite 630
Chicago, Illinois 60605
don.brown@illinois.gov

Melanie Jarvis
Deputy Chief Counsel
Illinois Environmental Protection Agency
2520 W. Iles Avenue
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Thomas Mroz
Kathryn Hussong
Premcor Refining Group, Inc.
One Valero Way
San Antonio, Texas 78249
Kathryn.Hussong@valero.com

That my email address is Melissa.Brown@heplerbroom.com

That the number of pages in the email transmission is 845.

That this email transmission took place before 4:30 p.m. on July 6, 2026.

Date: July 6, 2026

/s/ Melissa S. Brown
Melissa S. Brown

Electronic Filing: Received, Clerk's Office 07/06/2026

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

THE PREMCOR REFINING GROUP, INC.)		
)		
Petitioner,)		
)		PCB 2026-050
v.)		(Permit Appeal – RCRA)
)		
ILLINOIS ENVIRONMENTAL)		
PROTECTION AGENCY,)		
)		
Respondent.)		

ENTRY OF APPEARANCE OF MELISSA S. BROWN

NOW COMES Melissa S. Brown, of the law firm HEPLERBROOM, LLC, hereby enters her appearance in this matter on behalf of The Premcor Refining Group, Inc.

Respectfully submitted,

By: /s/ *Melissa S. Brown*

Dated: July 6, 2026

Melissa S. Brown, #6317838
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BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

THE PREMCOR REFINING GROUP INC.	)	
	)	
Petitioner,	)	
	)	PCB 26-50
v.	)	(Permit Appeal – RCRA)
	)	
ILLINOIS ENVIRONMENTAL PROTECTION AGENCY,	)	
	)	
Respondent.	)	

PETITION FOR REVIEW OF FINAL DECISION

Petitioner, The PREMCOR REFINING GROUP INC. ("Premcor"), by and through its undersigned counsel, pursuant to Section 40 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/40, and 35 Ill. Adm. Code Part 105, petitions the Illinois Pollution Control Board ("Board") for review of the final decision of the Illinois Environmental Protection Agency ("Agency" or "Illinois EPA") to disapprove Premcor's Corrective Measures Completion Report for the Soil Vapor Extraction System. In support therefore, Petitioner states as follows:

I. BACKGROUND

1. Petitioner currently owns and operates a terminal at 201 E. Hawthorne Street in Hartford, Illinois (Madison County).

2. On May 29, 2003, a Complaint for Injunctive and Other Relief was filed against Premcor and another entity regarding operations at the Hartford site, which at the time, included an oil refinery and associated pipelines operated by Premcor in addition to the storage, distribution, and terminal operations. *People v. The Premcor Refining Group Inc., et al*., 03-CH-459 (3d. Cir Madison County May 29, 2003). SR000001 – SR 000009.

3. A Third Amended Complaint was filed on June 3, 2013, alleging that Premcor, and other entities, violated the Act for contamination at the Hartford site from its operations at the site, among other alleged violations. SR000010 – SR000088.

4. In 2002, Premcor ceased refining operations at the Hartford site, but continued to conduct petroleum storage, distribution, and terminal operations that make up the Hartford Distribution Center. SR000099.

5. Per the direction of Illinois EPA and as part of negotiating a final settlement of the enforcement action, Premcor conducted, and continues to conduct, environmental response measures at the Hartford site. SR000102. Measures include, but are not limited to, hydraulic groundwater migration control through groundwater pumping and vapor-phase migration control through a Soil Vapor Extraction ("SVE") System. SR000565 – SR000660.

6. The SVE System was implemented as an interim remedial measure to limit the potential for vapor-phase contaminants of concern from migrating off-site along the Western Property Boundary Line ("WPBL") of the Site. SR000656; SR000736.

7. The SVE System has been operating since September 2006. The SVE System initially consisted of ten extraction wells along and near the WPBL SR000736. The SVE System was expanded in 2007 to include an additional six extraction wells near Monitoring Well RMW-35A. SR000736. The SVE System also includes a Blower Building, System Blower RB-1, Thermal Oxidizer RTO-1, the Control Building, and the Condensate Collection System.

8. As part of the Consent Order a Project Background Information, Technical Activities and Conceptual Site Model report (Consent Order Appendix 2) should be reviewed along with the Strategic, Tactical, and Operational Plan for Site-Wide Investigation/Remediation Work (Consent Order Appendix 4) (hereinafter "Strategic Plan"). SR000137 – SR000735.

9. Premcor entered into a Consent Order, entered by the Court on July 26, 2018, with the State of Illinois to resolve the alleged violations without an admission of the alleged violations. SR000089 – SR000136.

10. The Consent Order included dispute resolution provisions, which outline a process allowing for informal negotiation between the State of Illinois and Premcor and, if needed, judicial resolution, for disputes arising under the Consent Order. SR000110 – SR000112.

11. The Strategic Plan is incorporated by reference into the Consent Order. SR000115; *see* SR000636 – SR000735 for Strategic Plan.

12. The Strategic Plan "presents the pathway to site closure" and "defines the final remedial action plan for" the Site. SR000644 – SR000645.

13. The Strategic Plan explains that natural source zone depletion (a natural process that "depletes the source mass of [light non-aqueous phase liquid] over time") and natural attenuation ("natural processes that degrade contaminants in groundwater") have been occurring at the Site since the time the releases occurred. SR000659. The Strategic Plan explains that natural source zone depletion and natural attenuation "are now adopted into the Strategic Plan as a potential final remedy if implemented with the proper monitoring system." SR000659.

14. Monitored Natural Source Zone Depletion ("MNSZD") and Monitored Natural Attenuation ("MNA") along the WPBL has been occurring at the Site.

15. The Strategic Plan provides a process for transition from the SVE System to MNSZD and MNA. Under the Strategic Plan:

> Some form of active corrective action will be maintained along the WPBL in conjunction with MNA and MNSZD until such time that Illinois EPA approves the transition to MNA and MNSZD only. At a minimum, this corrective action will include bioventing, SVE, and/or [inward gradient control ("IGC")] with [groundwater extraction ("GWE")] as needed (GWE needs to be based on an analysis of historic data or demonstration

> via pilot testing in a preapproval report for Illinois EPA review and approval prior to cessation of GWE). IGC with GWE as needed along the WPBL will be implemented as required to meet plume migration metrics across the WPBL (Table 3) until such time as bioventing and/or SVE alone are appropriate to meet the metrics in Table 3. Bioventing and/or SVE will be implemented in a 50-foot wide section along the WPBL, shown in Figure 21, as required to meet plume migration metrics across the WPBL (Table 3). At the time that bioventing and/or SVE alone are appropriate to meet the metrics in Table 3, the IGC will cease operation and a corrective measures completion report (CMCR), demonstrating that off-site migration metrics in Section 4.3 are met, will be submitted for Illinois EPA review and approval.

SR000686.

16. "The effectiveness of MNA and MNSZD versus bioventing and/or SVE will be reviewed every 5 years and documented in a five-year evaluation report… and if MNA and MNSZD are more effective than bioventing and/or SVE, a request to cease operation of the bioventing and/or SVE will be submitted in a [Corrective Measures Completion Report] for Illinois EPA review and approval prior to shutdown of bioventing and/or SVE, with the understanding that Illinois EPA will approve the request if MNA and MNSZD combined exceed the rate of bioventing and/or SVE combined." SR000687.

17. Per the Strategic Plan, "[a] preapproval workplan will be submitted for Illinois EPA review and approval prior to full-scale implementation of MNSZD and MNA, monitoring and implementation of bioventing along the WPBL, or controls proposed in [corrective action objectives reports]." SR000686.

18. The Strategic Plan provides that a Corrective Measures Completion Report will be prepared when the following items have been achieved:

- Shut down of IGC along the WPBL;
- Transition from bioventing and/or SVE to MNA and MNSZD along the WPBL;
- Achievement of hydraulic recovery metrics (Table 6) sitewide;
- Achievement of LNAPL MEP (Table 7) sitewide; and

- Completion of a non-presumptive remedy as specified in a design plan and/or modification report.

SR000715.

II. CORRECTIVE MEASURES COMPLETION REPORT

19. On April 10, 2025, GEI Consultants, Inc. and St. John – Mittelhauser & Associates, Inc, A Terracon Company, on behalf of Premcor, submitted a Corrective Measures Completion Report for the SVE System (hereinafter "CMCR"). SR000736 – SR000821.

20. In the CMCR, Premcor requested that Illinois EPA approve the transition from operating the SVE System to MNSZD and MNA along the WPBL in accordance with the Strategic Plan. SR000736.

21. Premcor provided in the CMCR data to demonstrate that the remaining monitoring wells have achieved the site-specific decision point metric for soil gas recovery outlined in the Strategic Plan in the WPBL. SR000736 – SR000821.

22. The site-specific decision points for soil gas recovery include:

- When MNSZD and MNA are more effective than SVE;
- Lack of soil gas migration to off-site from contaminated groundwater from the WPBL;
- Soil gas recovery.

SR000737 (internal citations omitted).

23. To evaluate the overall effectiveness of the SVE System as compared to MNSZD and MNA, the relative volume recovered by each SVE System monitoring well was identified based on flame ionization detector ("FID") data at each wellhead. SR000737. The effectiveness of the SVE System was evaluated via monitoring events performed from September 2006 through October 2017. SR000738. The average recovery rate from the SVE System was approximately 700 gallons/acre/year. SR000738.

24. Annual MNSZD events were assessed in 2022 and 2023 and a one-time monitoring event was conducted to evaluate the MNSZD rates along the WPBL in 2023. SR000738. The MNSZD rate for the WPBL averaged 2,000 gallons/acre/year. SR000739.

25. Because the recovery rate of MNSZD exceeded the performance rate of the SVE System, the site-specific decision point for soil gas recovery in the WPBL has been achieved and the SVE System meets the metrics to transition to MNSZD and MNA.

III. AGENCY'S FINAL DECISION

26. On February 23, 2026, Illinois EPA issued a final decision letter ("Final Decision") disapproving the CMCR. A copy of the Final Decision is attached hereto as SR000822 – SR000829. The Final Decision Letter was received by Premcor on February 28, 2026.

27. In the Final Decision letter, Illinois EPA outlined the following reasons for disapproval:

1. The Strategic Plan requires that the effectiveness of MNA and MNSZD versus bioventing and/or SVE will be reviewed every five (5) years and documented in a 5-year evaluation report. It further states if MNA and MNSZD are more effective than bioventing and/or SVE, a request to cease operation of the bioventing and/or SVE will be submitted in a Corrective Measures Completion Report (CMCR) for Illinois EPA review and approval. Due to the large data gap (time reviewed is only one year within the WPBL and only two years site wide instead of a full five years) between the requirements of the Strategic Plan and the data presented to evaluate the effectiveness of the MNSZD in the subject submittal, the Illinois EPA has determined that submission of the CMCR is premature and cannot be approved at this time.

2. The presentation of data included in the subject submittal and the referenced Annual Progress Report is not technically adequate to support an evaluation of the effectiveness of MNSZD. All data and calculations used in the evaluation of the effectiveness of MNSZD should be included in the CMCR. Sufficient calculations to demonstrate achievement of the conclusions proposed by the

facility must be included in the CMCR. A complete narrative description of the process employed to produce conclusions must also be included in the CMCR.

3. The information provided in support of the Degassing Method is insufficient for the Illinois EPA to determine if this method was applied appropriately at the facility. An adequate description of the method is provided in the MNSZD Work Plan, but a proposal to use the Degassing Method should include a narrative description of how the method is applied, input values and how they were determined, calculations demonstrating how conclusions are reached, and relevant data.

4. It appears the single estimated MNSZD rate for the WPBL was not determined appropriately. In accordance with ASTM E3361-22, if there are measured natural attenuation rates from application of other methods besides the Degassing Method in the vadose zone, these rates cannot be combined.

5. The subject submittal does not provide a direct comparison of the effectiveness of SVE versus MNSZD in the WPBL, as the effectiveness of SVE was evaluated in wells screened in the North Olive and the Main Silt while the effectiveness of MNSZD was evaluated in wells screened in the North Olive, EPA Stratum/Main Sand, and the Main Sand Below the D Clay.

6. As stated in the previous letter (Log No. B-215-CA-9), the following conditions still need to be addressed:

   a) For any soil contamination above the groundwater saturated zone, the applicable chemical saturation levels (C_{sat}), soil attenuation limits, or total petroleum hydrocarbon (TPH) above the soil attenuation limits as set forth in 25 IAC Part 742 (Tiered Approaches to Corrective Action – TACO) are considered the source materials and will need to be remediated below the afore-mentioned levels prior to applying TACO remedial objectives.

      As noted in the Strategic Plan, the proposed MNSZD may be used where it is applicable for soil. As required in 35 IAC 742.120 and 300(b), characterization of any soil contamination that would be considered source materials must be clearly identified in any of the areas considered to have the proposed MNSZD monitoring areas and ensure that the soil source materials are not contributing to groundwater contamination as well as all other ingestion

and inhalation (outdoor and indoor) exposure routes to meet TACO remedial objectives.

b) When the proposed MNSZD is to be applied to the contaminated soils above the saturated zone for each specific area, the facility must provide a soil specific workplan to the Illinois EPA to implement the proposed MNSZD. Such workplan must include additional background conditions and proposed soil-specific plans for sampling, monitoring, and reporting. Such plan must also include the estimated: (1) amount of hydrocarbons to be remediated to reach the remedial goa; and (2) timeframe for no further action levels at each remediation area. Such plan should also include estimated degradation rates in soil when it is considered for soil contamination (i.e. differentiation from groundwater degradation). Furthermore, the workplace for media above the groundwater saturated zone must specifically address how the natural degradation in soil is monitored periodically by actual contaminated soil/soil gas sampling to eventually meet remedial objectives for the site developed in accordance with TACO.

7. It appears that the temperature versus elevation graphs (Figures 3A, 3B, etc.) for wells RSVE-01, RSVE-04, RSVE-45A, RSVE-07, RSVE-08, RSVE-09, and RSVE-10 in the 2023 Annual Progress Report, including the Fourth Quarter 2023 Quarterly Status Report, Premcor Facility Errata, (Attachment A), do not include the linear equations used to calculate the temperature gradients (dT/dz, both upward and downward). Without these equations, it is difficult to verify accurately the calculated MNSD rates.

SR000822 – SR000829.

IV. STANDARD OF REVIEW

28. Section 40(a)(1) of the Act provides an applicant the opportunity to petition for a hearing before the Board to contest the decision of the Agency to refuse to grant a permit. 415 ILCS 5/40(a)(1).

29. Part 105 of the Board's regulations governs appeals of final decisions of state agencies. 35 Ill. Adm. Code Part 105. Subpart B of Part 105 governs appeals of Illinois EPA

permit decisions and other final decisions. 35 Ill. Adm. Code 105, Subpart B. Section 105.204(f) authorizes a person who applied for or otherwise requested an Agency decision, or the person to whom the Agency directed its final decision, to petition the Board for review of the Agency's final decision to deny. 35 Ill. Adm. Code 105.204(f).

30. The burden of proof is on Petitioner. 415 ILCS 5/40(a)(1); 35 Ill. Adm. Code 105.112. "It is well settled that the Agency's denial letter frames the issues in a permit appeal before the Board." KCBX Terminals Co. v. IEPA, PCB 14-110 (June 19, 2024), 2014 WL 2871721, at *45.

V. GROUNDS FOR APPEAL AND ISSUES PROPOSED FOR REVIEW

31. Premcor petitions for review each of the reasons contained in Illinois EPA's Final Decision letter. SR000822 – SR000829; *see also* Paragraph 27 above.

32. The Agency's Final Decision was arbitrary and capricious, against the manifest weight of the evidence, clearly erroneous, and not supported by the record.

33. The WPBL SVE System has operated for approximately nineteen years.

34. The CMCR and documentation supporting it provide that the average MNSZD rate within the area of influence of the SVE System is approximately 2,000 galls/acre/year compared to the average SVE recovery rate of approximately 700 gallons/acre/year. SR000737 - SR000738.

35. Through testing several different wells in the WPBL area, Premcor has shown that MNSZD is more effective than the SVE System and the metrics to transition from the SVE System to MNSZD and MNA outlined in the Strategic Plan have been met. SR000736 – SR000821.

36. The information submitted to Illinois EPA in the CMCR and leading up to the CMCR was sufficient to evaluate whether the performance criterion established by the Strategic Plan for the transition from SVE to MNSZD had been achieved, which included sufficient detail on the Degassing Method for Illinois EPA to determine that the method was applied appropriately at the facility. SR000736 – SR000821.

37. Premcor disagrees with Illinois EPA's interpretation that the single estimated MNSZD rate for the WPBL was not determined appropriately. In its reasoning, Illinois EPA references the degassing method result for MNSZD from a lower stratigraphic horizon that was not part of the CMCR. SR000822 – SR000829; SR000736 – SR000821. Additionally, degassing MNSZD values were not used in the evaluation contained in the CMCR and were not added to the biogenic heat method MNSZD rates utilized in the CMCR. SR000736 – SR000821. As such, Illinois EPA's reasoning should not be a basis for a denial of the CMCR.

38. The evaluation that formed the basis of the CMCR directly measured MNSZD rates in the same stratigraphic horizon in which the SVE System has always operated, which constitutes a direct comparison of effectiveness. SR000736 – SR000821.

39. In its Final Decision Letter, Illinois EPA references various Tiered Approaches to Corrective Action ("TACO") requirements in relation to applying TACO remedial objectives. SR000822 – SR000829. However, the process for Illinois EPA to approve transition from SVE to MNSZD along the WPBL is limited in scope and time by the Strategic Plan. SR000736 – SR000821. In the CMCR, Premcor's request is limited to requesting approval of transition from operating the SVE System to MNSZD and MNA along the WPBL, and as such the various TACO objectives cited by Illinois EPA in its Final Decision Letter are inapplicable. *See* SR000736 – SR000821.

40. The temperature versus elevation graphs in the CMCR are sufficient to support its conclusion. Illinois EPA has not identified any error in the temperature data, temperature gradients, or resulting MNSZD calculations. SR000736 – SR000821.

41. As such, Illinois EPA's Final Decision to disapprove the CMCR was arbitrary and capricious, against the manifest weight of the evidence, and clearly erroneous.

VI. CONCLUSION

42. After receipt of the Final Decision letter, Premcor invoked the dispute resolution process under Section X.B. of the Consent Order and requested initiation of informal negotiations between the State and Premcor to address the Illinois EPA's reasons for disapproval of the CMCR.

43. However, in order to reserve its appeal rights under the Act, Petitioner respectfully requests that the Board grant review of the Agency's Final Decision to disapprove the CMCR and schedule a hearing in this matter to review such Final Decision.

44. Petitioner requests that the Board enter an order finding that the Agency's Final Decision was arbitrary and capricious, against the manifest weight of the evidence, clearly erroneous, and not supported by the record.

WHEREFORE, for the reasons set forth above, Petitioner, THE PREMCOR REFINING GROUP INC., petitions the Illinois Pollution Control Board for a hearing on the Illinois EPA's Final Decision, and requests that the Illinois Pollution Control Board find that Illinois EPA's Final Decision was improper, remand the matter to the Agency, and instruct the Agency to approve of the Corrective Measures Completion Report.

Respectfully submitted,

Dated: July 6, 2026

The Premcor Refining Group Inc.

By: /s/ *Melissa S. Brown*
One of Its Attorneys

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Respondent.	)	

EXHIBITS

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SR000736 – SR000821	Corrective Measures Completion Report (April 10, 2025)
SR000822 – SR000829	Illinois EPA Final Decision Letter (February 23, 2026)

IN THE CIRCUIT COURT FOR THE THIRD JUDICIAL CIRCUIT

MADISON COUNTY, ILLINOIS

FILED
MAY 29 2003
CLERK OF CIRCUIT COURT #8
THIRD JUDICIAL CIRCUIT
MADISON COUNTY, ILLINOIS

PEOPLE OF THE STATE OF ILLINOIS, ex rel. LISA MADIGAN, Attorney General of the State of Illinois, and WILLIAM A. MUDGE, Madison County State's Attorney	)	
Plaintiff,	)	
v.	)	**NO.** 03CH 459
THE PREMCOR REFINING GROUP, INC., a foreign corporation, and APEX OIL COMPANY, INC., a foreign corporation,	)	
Defendants.	)	

Original

COMPLAINT FOR INJUNCTIVE AND OTHER RELIEF

The PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois, on her own motion, and WILLIAM A. MUDGE, Madison County State's Attorney, on his own motion, complains of the Defendants, THE PREMCOR REFINING GROUP, INC., and APEX OIL COMPANY, INC., as follows:

COUNT I

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Sections 42(d) and (e) of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2000).

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the

public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery(the "Refinery") and associated pipelines located in Hartford, Madison County, Illinois.

4. Defendant Apex Oil Company, Inc., ("Apex"), is a corporation organized under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the former owner of the Refinery and associated pipelines. Apex acquired the Refinery and associated pipelines in 1981 when it acquired Clark Oil and Refining Corporation, a Wisconsin corporation (hereafter "Clark Wisconsin"). In 1988, Apex sold the Refinery and associated pipelines to Premcor as part of its reorganization in bankruptcy. At the time of the sale, Premcor was known as AOC Acquisition Company and thereafter changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name. Two of the principals in Apex were significant shareholders of AOC Acquisition Company.

5. Section 21 of the Act, 415 ILCS 5/21 (2000), provides that:

No person shall:

* * *

m. Transfer interest in any land which has been used as a hazardous waste disposal site without written notification to the Agency of the transfer and to the transferee of the conditions imposed by the Agency upon its use under subsection (g) of Section 39.

n. Use any land which has been used as a hazardous waste disposal site except in compliance with conditions imposed by the Agency under subsection (g) of Section 39.

* * *

6. Section 39(g) of the Environmental Protection Act, 415 ILCS 5/39(g), provides that:

> The Agency shall include as conditions upon all permits issued for hazardous waste disposal sites such restrictions upon the future use of such sites as are reasonably necessary to protect public health and the environment, including permanent prohibition of the use of such sites for purposes which may create an unreasonable risk of injury to human health or to the environment. After administrative and judicial challenges to such restrictions have been exhausted, the Agency shall file such restrictions of record in the Office of the Recorder of the county in which the hazardous waste disposal site is located.

7. Section 3.15 of the Act, 415 ILCS 5/3.15 (2000), provides that:

> "Hazardous Waste" means a waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; * * *

8. Section 3.53 of the Act, 415 ILCS 5/3.53 (2000), provides that:

> "Waste" means any garbage, sludge from a waste treatment, water supply treatment plant, or air pollution control facility or other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations; * * *

9. Sections 21(m) and (n) and 39(g) were added by Public Act 81-1484 and became effective July 1, 1980.

10. The pipelines associated with the Refinery include a group of three pipelines that extend from the Refinery west to Olive Street and then north to Elm Street and from there west to the Mississippi River. These pipelines were first installed in the early 1950's. A

second set of two pipelines extends west from the Refinery to Olive Street and then north to the Hartford/Wood River Terminal. When Clark Wisconsin acquired the Refinery from Sinclair Oil Corporation, it acquired one of these pipelines and Sinclair Oil Corporation retained the other. During the course of operation of these pipelines, thousands of gallons of leaded gasoline leaked from the pipelines and percolated into the ground underneath a substantial area of the northern third of Hartford.

11. The leaded gasoline contains benzene, xylene, and other compounds that because of their chemical characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness.

12. Periodically, from the 1960's to the present, vapors from the leaked gasoline have infiltrated into basements, crawl spaces and living spaces in homes in the northern third of Hartford. There have been fires, explosions and evacuations as a result of these vapors.

13. In 1978, Clark Wisconsin installed a limited capacity liquid recovery system to recover some of the leaked gasoline and operated it until the transfer of the Refinery and associated pipelines to Apex in 1981. Apex continued to operate the liquid recovery system periodically thereafter.

14. In 1982, Apex installed new pipelines through the Elm Street easement and abandoned the former pipelines in place. On information and belief, Apex did not address the existing soil contamination present under and near the abandoned pipelines.

15. Neither Clark Wisconsin nor Apex notified the Illinois EPA of the transfer of the interest in the land underlying the associated pipelines or obtained a permit with conditions to address the released gasoline prior to the transfer of the refinery and associated pipelines

from Clark Wisconsin to Apex in 1981. Apex has, therefore, violated and continues to violate Section 21(n) of the Act, 415 ILCS 5/21(n).

16. Apex did not notify the Illinois EPA of the transfer of the interest in the land underlying the associated pipelines or obtain a permit with conditions to address the released gasoline prior to the transfer of the refinery and associated pipelines to Premcor in 1988. Apex has, therefore, violated and continues to violate Section 21(m) of the Act, 415 ILCS 5/21(m).

17. After its acquisition of the Refinery and associated pipelines, Premcor installed a vapor recovery system in and near Elm Street in response to the continued presence of the released gasoline in 1991. Premcor has operated that system since then.

18. Premcor has not applied for or obtained a permit with conditions to address the released gasoline. Premcor has violated and continues to violate Section 21(n) of the Act, 415 ILCS 5/21(n).

19. During the late spring and early summer of 2002, several homes on Watkins Street were again affected by gasoline vapors infiltrating up from the ground and had to be evacuated.

20. These conditions and violations will continue unabated unless enjoined by this Court.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that the Defendant, Apex Oil Company, Inc., has violated Sections 21(m) and (n) of the Act, 415 ILCS 5/21(m) and (n) (2000);

B. Find that the Defendant, The Premcor Refining Group, Inc., has violated Section 21(n) of the Act, 415 ILCS 5/21(n) (2000);

C. Permanently enjoin the Defendants from further violations of the Act and associated regulations;

D. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42a) (2000), impose upon the Defendant a monetary penalty of not more than the statutory maximum;

E. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2000), award the Plaintiff its costs in this matter, including reasonable attorney's fees and expert witness costs; and

F. Grant such other and further relief as this Court deems appropriate.

COUNT II

1-20. Plaintiff realleges and incorporates herein by reference paragraphs 1 through 20 of Count I as paragraphs 1 through 20 of this Count II.

21. Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d) (which became effective November 29, 1993), provides that:

> A responsible party is liable for any damage or removal costs, whether present or future, resulting from or arising out of any discharge, as defined in Section 5.

22. Section 5 of the Oil Spill Responders Liability Act, 740 ILCS 113/5 (which became effective November 29, 1993), provides the following definitions:

> "Damages" means damages of any kind for which liability may exist under the laws of this State resulting from, arising out of, or related to the discharge or threatened discharge of oil.
>
> "Discharge" means an emission, other than natural seepage, intentional or

unintentional, and includes, but is not limited to, spilling, leaking, pumping, pouring, emitting, emptying, or dumping.

* * *

"Oil" means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil, sludge, oil refuse, and oil mixed with waste other than dredged spoil, but does not include petroleum, including crude oil or any fraction of crude oil, that is specifically listed or designated as a hazardous substance under subparagraphs (A) through (F) of Section 101(14) of the federal Comprehensive Environmental response Compensation and Liability Act (42 U.S.C. 9601) and that is subject to the provision of that Act.

"Person" means an individual, a corporation, a partnership, an association, the State, a municipality, a commission, or a political subdivision of the State, or an interstate body.

"Removal costs" means the costs of removal incurred after a discharge of oil or, when there is a substantial threat of a discharge of oil, the costs to prevent, minimize, or mitigate oil pollution from an incident.

"Responsible party" means a responsible party as defined under Section 1001 of the Oil Pollution Act of 1990, Public Law No. 101-380 (33 U.S.C. 1001).

23. Section 1001(32) of the Oil Pollution Act of 1990, 33 U.S.C. 1001(32), defines "responsible party" as:

* * *

(B) Onshore facilities

In the case of an onshore facility (other than a pipeline), any person owning or operating the facility, except a Federal agency, State, municipality, commission, or political subdivision of a State, or any interstate body, that as the owner transfers possession and right to use the property to another person by lease, assignment or permit.

* * *

(E) Pipelines

In the case of a pipeline, any person owning or operating the pipeline.

(F) Abandonment

In the case of an abandoned vessel, onshore facility, deepwater port, pipeline, or offshore facility, the persons who would have been responsible immediately prior to the abandonment of the vessel or facility.

24. The State of Illinois has incurred and will continue to incur removal costs as a result of the leaking of gasoline from the Elm Street pipelines abandoned by Apex.

25. Since Premcor's acquisition of the Refinery and pipelines, there have been additional leaks and spills from the pipelines within the Village of Hartford. The State of Illinois has incurred removal costs as a result of those spills and leaks.

26. Apex and Premcor are liable for the State's removal costs.

PRAYER FOR RELIEF

WHEREFORE the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find the Defendant Apex Oil Company, Inc., to be liable for the removal costs incurred by the State of Illinois as a result of the leaks of petroleum from the pipelines abandoned by Apex pursuant to Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d);

B. Find the Defendant, The Premcor Refining Group, Inc., to be liable for the removal costs incurred by the State of Illinois as a result of the leaks of petroleum from the pipelines owned by Premcor pursuant to Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d); and

C. Grant such other and further relief as this Court deems appropriate.

Respectfully submitted,

PEOPLE OF THE STATE OF ILLINOIS,
ex rel. Lisa MADIGAN,
Attorney General
of the State of Illinois,

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

BY:_____
THOMAS DAVIS, Chief
Assistant Attorney General
Environmental Bureau

WILLIAM A. MUDGE
MADISON COUNTY
STATE'S ATTORNEY

BY:_____
Phillip B. Alfeld
Assistant State's Attorney
Madison County Courthouse
157 North Main Street, Suite 402
Edwardsville, IL 62025
618-692-6280
Reg. No. 3128611

ADDITIONAL ATTORNEY OF RECORD:
JAMES L. MORGAN
Senior Assistant Attorney General
Environmental Bureau
500 South Second Street
Springfield, Illinois 62706
217/524-7506
Reg. No.: 6183865

Dated:_____

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IN THE CIRCUIT COURT FOR THE THIRD JUDICIAL CIRCUIT
MADISON COUNTY, ILLINOIS

PEOPLE OF THE STATE OF ILLINOIS, ex rel. LISA MADIGAN, Attorney General of the State of Illinois, and Thomas D. Gibbons, Madison County State's Attorney	)	
Plaintiff,	)	
v.	)	**NO. 03-CH-459**
THE PREMCOR REFINING GROUP, INC., a foreign corporation, and APEX OIL COMPANY, INC., a foreign corporation,	)	
Defendants.	)	

THIRD AMENDED COMPLAINT FOR INJUNCTIVE AND OTHER RELIEF

The PEOPLE OF THE STATE OF ILLINOIS, *ex rel.* LISA MADIGAN, Attorney General of the State of Illinois, on her own motion, and THOMAS D. GIBBONS, Madison County State's Attorney, on his own motion, complains of the Defendants, THE PREMCOR REFINING GROUP, INC., and APEX OIL COMPANY, INC., as follows:

COUNT I: COMMON LAW PUBLIC NUISANCE[1]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), and by Thomas D. Gibbons, Madison County State's Attorney on his own motion..

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the

[1] New Count.

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public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of

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Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC Oil & Refining Corporation) was merged into Apex.

5. During the period after its acquisition of the Refinery through its merger into Clark Oil, Clark Wisconsin discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on any land or water at various sites within the Refinery so that such materials and constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area, including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the "Triangle Area", the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

6. During the period after its acquisition of the Refinery from Clark Wisconsin, Clark Oil discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted

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into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area. In 1983, Clark Oil was informed by a consultant it hired that a pool of gasoline and other petroleum totaling 9,000,000 gallons was present underneath the Refinery but Clark Oil took no action to reduce or control that contamination.

7. The gasoline, wastes, and other materials contain benzene, xylene, lead, and other compounds that, because of their chemical characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. These materials include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant to Board regulations because of the threat they pose to human health and the environment, including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge – F038. These contaminants render groundwater and surface water impure and prejudice others. These contaminants also generate vapors which travel through the soil and into structures and the atmosphere to the prejudice of others.

8. Clark Wisconsin allowed these contaminants to remain in place.

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9. Clark Oil allowed and continues to allow these contaminants to remain in place. The sale of the Refinery did not relieve it of this liability.

10. Since Premcor's acquisition of the Refinery and pipelines, Premcor allowed and continues to allow these contaminants to remain in place. There have also been additional leaks and spills of contaminants within the Refinery which Premcor allowed and continues to allow these contaminants to remain in place.

11. These conditions will remain, harming and threatening to harm the public health and the environment, unless Apex and Premcor are permanently enjoined to abate them.

12. There is no adequate remedy at law for these conditions. The balance of the equities favor injunctive relief.

13. The State of Illinois has incurred and continues to incur costs to abate the nuisance resulting from the continued presence of these contaminants.

14. Apex, as successor by merger to Clark Wisconsin and Clark Oil, and Premcor are liable for the State's costs.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that the Defendant, Apex Oil Company, Inc., as successor to Clark Wisconsin and Clark Oil, to be liable for the public nuisance at the Refinery;

B. Pursuant to its common law equitable powers, permanently enjoin the Apex Oil Company to abate the public nuisance;

C. Require Apex Oil Company, Inc., to reimburse the State of Illinois for the costs

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incurred in abating the public nuisance;

D. Find that the Defendant, The Premcor Refining Group, Inc., to be liable for the public nuisance at the Refinery;

E. Pursuant to its common law equitable powers, permanently enjoin The Premcor Refining Group, Inc.,to abate the public nuisance;

F. Require The Premcor Refining Group, Inc., to reimburse the State of Illinois for the costs incurred in abating the public nuisance; and

G. Grant such other and further relief as this Court deems appropriate.

COUNT II: STATUTORY PUBLIC NUISANCE[2]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), and by Thomas D. Gibbons, Madison County State's Attorney on his own motion..

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former

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[2] New Count.

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owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC

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Oil & Refining Corporation) was merged into Apex.

5. Section 47-5 of the Criminal Code of 1961, 720 ILCS 5/47-5, previously enacted as 740 ILCS 55/221, provides that:

> Public Nuisance. It is a public nuisance:
>
> (1) To cause or allow the carcass of an animal or offal, filth or a noisome substance to be collected, deposited, or to remain in any place to the prejudice of others.
>
> * * *
>
> (3) To corrupt or render unwholesome or impure the water of a spring, river, stream, pond or lake to the injury or prejudice of others.
>
> * * *

6. Section 47-25 of the Criminal Code of 1961, 720 ILCS 5/47-25, previously enacted as 740 ILCS 55/222, provides that:

> Penalties. Whoever causes, erects, or continues a nuisance described in this Article, for the first offense is guilty of a petty offense and shall be fined not exceeding $100, and for a subsequent offense is guilty of a Class B misdemeanor. Every nuisance described in this Article, when a conviction for that nuisance is had, may, by order of the court before which the conviction is had, be abated by the sheriff or other proper officer, at the expense of the defendant. It is not a defense to a proceeding under this Section that the nuisance is erected or continued by permission of a law of this State.

7. During the period after its acquisition of the Refinery through its merger into Clark Oil, Clark Wisconsin discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on any land or water at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters

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at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the "Triangle Area", the disposal area in the South Property, the storm water sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

8. During the period after its acquisition of the Refinery from Clark Wisconsin, Clark Oil discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the disposal area in the South Property, the storm water sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area. In 1983, Clark Oil was informed by a consultant it hired that a pool of gasoline and other petroleum totaling 9,000,000 gallons was present underneath the Refinery.

9. The gasoline and other materials containing benzene, xylene, lead, and other compounds that, because of their chemical characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. These materials include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant

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to Board regulations because of the threat they pose to human health and the environment, including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge – F038. These contaminants render groundwater and surface water impure and prejudice others. These contaminants also generate vapors which travel through the soil and into structures and the atmosphere to the prejudice of others.

10. Clark Wisconsin allowed these contaminants to remain in place.

11. Clark Oil allowed and continues to allow these contaminants to remain in place.

12. Premcor allowed and continues to allow these contaminants to remain in place. Since Premcor's acquisition of the Refinery and pipelines, there have been additional leaks and spills of gasoline and other contaminants within the Refinery. Premcor allowed and continues to allow much of these additional contaminants to remain in place.

13. These conditions will remain, harming and threatening to harm the public health and the environment, unless Apex and Premcor are permanently enjoined to abate them.

14. There is no adequate remedy at law for these conditions. The balance of the equities favor injunctive relief. An injunction requiring the removal of the contaminants and control of the movement of those contaminants off-site will provide a more complete remedy than that afforded by a criminal prosecution.

15. The State of Illinois has incurred costs to abate the nuisance resulting from the continued presence of these contaminants.

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16. Apex, as successor by merger to Clark Wisconsin and Clark Oil, and Premcor are liable for the State's costs.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that the Defendant, Apex Oil Company, Inc., as successor to Clark Wisconsin and Clark Oil, to be liable for the public nuisance at the Refinery;

B. Pursuant to its common law equitable powers, permanently enjoin the Apex Oil Company to abate the public nuisance;

C. Require Apex Oil Company, Inc., to reimburse the State of Illinois for the costs incurred in abating the public nuisance;

D. Find that the Defendant, The Premcor Refining Group, Inc., to be liable for the public nuisance at the Refinery;

E. Pursuant to its common law equitable powers, permanently enjoin The Premcor Refining Group, Inc.,to abate the public nuisance;

F. Require The Premcor Refining Group, Inc., to reimburse the State of Illinois for the costs incurred in abating the public nuisance; and

G. Grant such other and further relief as this Court deems appropriate.

COUNT III: LIABILITY UNDER SECTION 22.3 OF THE ENVIRONMENTAL PROTECTION ACT[3]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.*

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[3] New Count.

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Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion..

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including

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the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC Oil & Refining Corporation) was merged into Apex.

5. Section 22.3 of the Act, 415 ILCS 5/22.3 (2012), provides that:

> The owner and operator of a hazardous waste disposal site shall, without limitation, be responsible for the site for a period of 20 years after closure of the site, or such longer period of time as required by the federal Resource Conservation and Recovery Act of 1976, P.L. 94-580, or regulations issued thereunder, or by Board regulation issued under Section 22(a) or (f) of this Act. The owner and operator shall monitor such site for gas migration, drainage problems, erosion, settling, ground and surface water pollution and other environmental and safety problems which occur, and shall take whatever remedial action is necessary to solve such problems which occur at the site during the period of responsibility. Notwithstanding the provisions of this Section, nothing contained herein shall be construed to limit any duties or liabilities imposed on an owner or operator of a solid waste disposal site pursuant to this Act or regulations thereunder or ariing by operation of law. [Added by Public Act 81-856, effective January 1, 1980]

6. Section 3.185 of the Environmental Protection Act, 415 ILCS 5/3.185 (2012),

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provides that:

> "Disposal" means the discharge, deposit, injection, dumping, spilling, leaking or placing of any waste or hazardous waste into or on any land or water or into any well so that such waste or hazardous waste or any constituent thereof may enter into the environment or be emitted into the air or discharged into any waters, including ground waters.

7. Section 3.220 of the Act, 415 ILCS 5/3.220 (2012), provides that:

> "Hazardous Waste" means a waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed, and which has been identified, by characteristics or listing, as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant to Board regulations.

8. Section 3.225 of the Act, 415 ILCS 5/3.225 (2012), provides that:

> "Hazardous waste disposal site" is a site at which hazardous waste is disposed.

9. Section 3.535 of the Act, 415 ILCS 5/3.535 (2012), provides that:

> "Waste" means any garbage, sludge from a waste treatment, water supply treatment plant, or air pollution control facility or other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations; * * *

10. During the period of January 1, 1980 through its merger into Clark Oil, Clark Wisconsin discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on any land or water at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1

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and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the "Triangle Area", the disposal area in the South Property, the storm water sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

11. During the period after its merger into Clark Wisconsin, Clark Oil discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the disposal area in the South Property, the storm water sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

12. The gasoline and other materials contain benzene, xylene, lead, and other compounds that, because of their chemical characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. These materials include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant to Board regulations, including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge –

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F038.

13. Clark Wisconsin did not close any of the hazardous waste disposal sites it had used to dispose of hazardous wastes nor did it undertake any monitoring of those sites for gas migration or ground or surface water pollution nor did it take any remedial action to address such conditions.

14. While Clark Oil discontinued its disposal of hazardous wastes at one or more of these sites prior to November 1988, it did not close those sites or any of the other hazardous waste disposal sites where it continued to dispose of hazardous wastes up to the sale of the Refinery to Premcor nor did it undertake any monitoring of those sites for gas migration or ground or surface water pollution nor did it take any remedial action to address such conditions.

15. As the owner and operator of hazardous waste disposal sites, Clark Wisconsin was and remains obligated, without limitation, to close each hazardous waste disposal site and is responsible to manage and monitor each site for a period of 20 years after closure of the site, or such longer period of time as required by the federal Resource Conservation and Recovery Act of 1976, P.L. 94-580, or regulations issued thereunder, or by Board regulation issued under Section 22(a) or (f) of the Environmental Protection Act. By failing to close its hazardous waste disposal sites or to monitor each site for gas migration, ground and surface water pollution and other environmental and safety problems which occur, or to take whatever remedial action is necessary to solve such problems which occur at each site during the period of responsibility, Clark Wisconsin has violated and continues to violate Section 22.3 of the Environmental Protection Act, 415 ILCS 5/22.3. Apex, as successor by merger, is liable for those violations.

16. As the owner and operator of hazardous waste disposal sites, Clark Oil was and

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remains obligated, without limitation, to close each hazardous waste disposal site and is responsible to manage and monitor each site for a period of 30 years after closure of the site as required by regulations issued under the federal Resource Conservation and Recovery Act of 1976, P.L. 94-580 (40 CFR 264.110, 264.117(a), 265.110 and 265.117(a)), and by Board regulation issued under Section 22(a) or (f) of the Environmental Protection Act (35 Ill. Adm. Code 724.210, 724.217(a), 725.210, 725.217(a). By failing to close its hazardous waste disposal sites or to monitor each site for gas migration, ground and surface water pollution and other environmental and safety problems which occur, or to take whatever remedial action is necessary to solve such problems which occur at each site during the period of responsibility, Clark Oil has violated and continues to violate Section 22.3 of the Environmental Protection Act, 415 ILCS 5/22.3. Apex, as successor by merger, is liable for those violations.

17. After its acquisition of the Refinery, Premcor discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations, including primary and secondary wastewater separation sludge (F037 and F038) and slop oil emulsion solids (hazardous waste listed as K049) generated at the Hartford refinery, and ACFM centrifuge sludge (K169), and spent hydrotreating catalyst (hazardous waste listed as K171) into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery.

18. Premcor initiated closure of its primary and secondary wastewater separation sludge (F037 and F038), slop oil emulsion solids (hazardous waste listed as K049), ACFM

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centrifuge sludge (K169), and spent hydrotreating catalyst (hazardous waste listed as K171) hazardous waste disposal sites but has not done so at the other hazardous waste disposal sites it created.

19. As the owner and operator of hazardous waste disposal sites, Premcor was and remains obligated, without limitation, to close each hazardous waste disposal site and is responsible for each site for a period of 30 years after closure of the site as required by regulations issued under the federal Resource Conservation and Recovery Act of 1976, P.L. 94-580 (40 CFR 264.110, 264.117(a), 265.110 and 265.117(a)), and by Board regulation issued under Section 22(a) or (f) of the Environmental Protection Act (35 Ill. Adm. Code 724.210, 724.217(a), 725.210, 725.217(a). By failing to close its hazardous waste disposal sites or to monitor each site for gas migration, ground and surface water pollution and other environmental and safety problems which occur, or to take whatever remedial action is necessary to solve such problems which occur at each site during the period of responsibility, Premcor has violated and continues to violate Section 22.3 of the Environmental Protection Act, 415 ILCS 5/22.3.

20. These conditions will remain, harming and threatening to harm the public health and the environment, unless Apex and Premcor are permanently enjoined to abate them.

21. There is no adequate remedy at law for these conditions. The balance of the equities favor injunctive relief.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that the Defendant, Apex Oil Company, Inc., as successor to Clark

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Wisconsin and Clark Oil, to be liable for the violations of Sections 22.3 of the Act, 415 ILCS 5/22.3 (2012);

B. Pursuant to its common law equitable power and any additional authority provided by Section 42(e) of the Act, permanently enjoin the Apex Oil Company to cease and desist from further violations of Section 22.3 of the Act, 415 ILCS 5/22.3 and to close each of the hazardous waste disposal sites within the Refinery created by Clark Wisconsin and Clark Oil, and therafter to monitor each site for gas migration, ground and surface water pollution and other environmental and safety problems which occur, or to take whatever remedial action is necessary to solve such problems which occur at each site during the period of responsibility;

C. Find that the Defendant, The Premcor Refining Group, Inc., has violated Section 22.3 of the Act, 415 ILCS 5/22.3 (2012);

D. Pursuant to its common law equitable power and any additional authority provided by Section 42(e) of the Act, permanently enjoin The Premcor Refining Group, Inc., to cease and desist from further violations of Section 22.3 of the Act, 415 ILCS 5/22.3, and to close each of the hazardous waste disposal sites within the Refinery created by Clark Wisconsin and Clark Oil, and thereafter to monitor each site for gas migration, ground and surface water pollution and other environmental and safety problems which occur, or to take whatever remedial action is necessary to solve such problems which occur at each site during the period of responsibility;

E. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42a) (2012), impose upon each Defendant a monetary penalty of not more than the statutory maximum;

F. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award the Plaintiff

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its costs in this matter, including reasonable attorney's fees and expert witness costs; and

G. Grant such other and further relief as this Court deems appropriate.

COUNT IV: LIABILITY FOR RELEASES AND THREATENED RELEASES OF HAZARDOUS SUBSTANCES[4]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Sections 22.2 and 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/22.2 and 42 (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion..

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in

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[4] New Count.

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the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC Oil & Refining Corporation) was merged into Apex.

5. During the period after its acquisition of the Refinery through its merger into Clark Oil, Clark Wisconsin discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-

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solid material resulting from its Refinery operations into or on any land or water at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the "Triangle Area", the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

6. During the period after its acquisition of the Refinery from Clark Wisconsin, Clark Oil discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area. In 1983, Clark Oil was informed by a consultant it hired that a pool of gasoline and other petroleum totaling 9,000,000 gallons was present underneath the Refinery.

7. The gasoline and other materials containing benzene, xylene, lead, and other compounds that, because of their chemical characteristics, may cause or significantly contribute

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to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. These materials include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, and pursuant to Board regulations because of the threat they pose to human health and the environment, including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge – F038. These contaminants render groundwater and surface water impure and prejudice others. These contaminants also generate vapors which travel through the soil and into structures and the atmosphere to the prejudice of others. These wastes and other materials include hazardous substances as defined by Section 3.215 of the Act, 415 ILCS 5/3.215 (2002).

8. Section 22.2 of the Act, 415 ILCS 5/22.2 (2002), provides that:

* * *

f. Notwithstanding any other provision or rule of law, and subject only to the defenses set forth in subsection (j) of this Section, the following persons shall be liable for all costs of removal or remedial action incurred by the State of Illinois or any unit of local government as a result of a release or substantial threat of a release of a hazardous substance or pesticide:

1. the owner and operator of a facility or vessel from which there is a release or substantial threat of a release of a hazardous substance or pesticide;

2. any person who at the time of disposal, transport, storage or treatment of a hazardous substance or pesticide owned or operated the facility or vessel used for such disposal, transport, treatment or storage from which there was a release or substantial threat of a release of a hazardous substance or pesticide;

3. any person who by contract, agreement, or otherwise arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment, of such hazardous substances owned or possessed

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> by such person, by any other party or entity, at any facility, * * *, owned or operated by another party or entity and containing such hazardous substances,
>
> * * *

9. The State has incurred and will continue to incur response costs, as defined by the Act, associated with the releases and threatened releases of hazardous substances at the Facility.

10. Clark Wisconsin is a responsible party as described in Section 22.2(f)(1)-(2) of the Act, 415 ILCS 4/22.2(f)(1)-(2), and is liable for past, present, and future response costs, as defined by the Act, incurred by the State resulting or arising out of the releases and threatened releases at the Refinery.

11. Clark Oil is a responsible party as described in Section 22.2(f)(1)-(2) of the Act, 415 ILCS 4/22.2(f)(1)-(2), and is liable for past, present, and future response costs, as defined by the Act, incurred by the State resulting or arising out of the releases and threatened releases at the Refinery.

12. Apex, as successor by merger to Clark Wisconsin and Clark Oil, and Premcor are liable for the State's costs.

13. Premcor is a responsible party as described in Section 22.2(f)(1)-(2) of the Act, 415 ILCS 4/22.2(f)(1)-(2), and is liable for past, present, and future response costs, as defined by the Act, incurred by the State resulting or arising out of the releases and threatened releases at the Refinery.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find the Defendant Apex Oil Company, Inc., to be liable for past, present, and future response costs, as defined by the Act, incurred by the Illinois EPA as a result of the releases and threatened releases of hazardous substances at the Refinery;

B. Find the Defendant, The Premcor Refining Company Inc., to be liable for past, present, and future response costs, as defined by the Act, incurred by the Illinois EPA as a result of the releases

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and threatened releases of hazardous substances at the Refinery;

C. Award Plaintiff its costs; and

D. Grant such other relief as the Court may deem appropriate.

COUNT V: WASTE DISPOSAL VIOLATIONS[5]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in

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[5] New Count against Apex Oil Company and The Premcor Refining Group, Inc.

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the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC Oil & Refining Corporation) was merged into Apex.

5. During the period after its acquisition of the Refinery through its merger into Clark Oil, Clark Wisconsin discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from waste treatment, and other solid, liquid, or semi-solid

material resulting from its Refinery operations into or on any land or water at various sites within the Refinery so that such materials and constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area, including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the "Triangle Area", the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

6. During the period after its acquisition of the Refinery from Clark Wisconsin, Clark Oil discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area. In 1983, Clark Oil was informed by a consultant it hired that a pool of gasoline and other petroleum totaling 9,000,000 gallons was present underneath the Refinery but Clark Oil took no action to reduce or control that contamination.

7. The gasoline, wastes, and other materials contain benzene, xylene, lead, and other compounds that, because of their chemical characteristics, may cause or significantly contribute

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to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. These materials include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant to Board regulations because of the threat they pose to human health and the environment, including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge – F038. These contaminants render groundwater and surface water impure and prejudice others. These contaminants also generate vapors which travel through the soil and into structures and the atmosphere to the prejudice of others.

8. Clark Wisconsin allowed these contaminants to remain in place.

9. Clark Oil allowed and continues to allow these contaminants to remain in place. The sale of the Refinery did not relieve it of this liability.

10. Since Premcor's acquisition of the Refinery and pipelines, Premcor allowed and continues to allow these contaminants to remain in place. There have also been additional leaks and spills of contaminants within the Refinery which Premcor allowed and continues to allow these contaminants to remain in place.

11. Section 21 of the Act, 415 ILCS 5/21 (2012), provides, in pertinent part, as follows:

No person shall:

a. Cause or allow the open dumping of any waste;

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* * *

d. Conduct any waste-storage, waste-treatment, or waste-disposal operation:

* * *

2. In violation of any regulations or standards adopted by the Board under this Act; or

e. Dispose, treat, store or abandon any waste, * * *, except at a site or facility which meets the requirements of this Act and of the regulations and standards thereunder.

f. Conduct any hazardous waste-storage, hazardous waste-treatment, or hazardous waste-disposal operation:

1. Without a RCRA permit for the site issued by the Agency under subsection (d) of Section 39 of this Act or in violation of any conditions imposed by such permit * * *; or

2. In violation of any regulations or standards adopted by the Board under this Act; or

* * *

12. By causing or allowing the disposal of petroleum, oily wastes and other wastes at the Refinery in a manner which did not meet the requirements for a sanitary landfill, Clark Wisconsin and Clark Oil violated and will continue to violate Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e) (2012). Apex, as successor by merger, is liable for those violations.

13 By causing or allowing the disposal of petroleum, oily wastes and other wastes at the Refinery in a manner which did not meet the requirements for a sanitary landfill, Premcor violated and will continue to violate Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e) (2012). By causing or allowing the release of gasoline from Tank 80-11 onto the ground as described above, Premcor violated Sections 12(a) and (d) of the Act, 415 ILCS 5/12(a) and (d) (2012).

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14. These conditions will remain, harming and threatening to harm the public health and the environment, unless Apex and Premcor are permanently enjoined to abate them.

15. There is no adequate remedy at law for these conditions. The balance of the equities favor injunctive relief.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that Defendant, The Premcor Refining Group, Inc., and Apex Oil Company, as successor to Clark Wisconsin and Clark Oil, have violated Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e) (2012);

B. Pursuant to its common law equitable power and any additional authority provided by Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendants to cease and desist from any further violations of the Act and associated regulations and to properly abate all contamination resulting from these violations and ;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon the Defendants a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter, including reasonable attorney fees and expert witness costs; and

E. Grant to Plaintiff such other and further relief as this Court deems appropriate.

COUNT VI: HAZARDOUS WASTE DISPOSAL SITE PERMITS[6]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.*

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[6] Previously Count I of the Second Amended Complaint with revisions.

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Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including

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the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC Oil & Refining Corporation) was merged into Apex.

5. Section 21 of the Act, 415 ILCS 5/21 (2012), provides that:

No person shall:

* * *

m. Transfer interest in any land which has been used as a hazardous waste disposal site without written notification to the Agency of the transfer and to the transferee of the conditions imposed by the Agency upon its use under subsection (g) of Section 39.

n. Use any land which has been used as a hazardous waste disposal site except in compliance with conditions imposed by the Agency under subsection (g) of Section 39.

* * *

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6. Section 39(g) of the Environmental Protection Act, 415 ILCS 5/39(g), provides that:

> The Agency shall include as conditions upon all permits issued for hazardous waste disposal sites such restrictions upon the future use of such sites as are reasonably necessary to protect public health and the environment, including permanent prohibition of the use of such sites for purposes which may create an unreasonable risk of injury to human health or to the environment. After administrative and judicial challenges to such restrictions have been exhausted, the Agency shall file such restrictions of record in the Office of the Recorder of the county in which the hazardous waste disposal site is located.

7. Section 3.220 of the Act, 415 ILCS 5/3.220 (2012), provides that:

> "Hazardous Waste" means a waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness; * * *

8. Section 3.535 of the Act, 415 ILCS 5/3.535 (2012), provides that:

> "Waste" means any garbage, sludge from a waste treatment, water supply treatment plant, or air pollution control facility or other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining and agricultural operations; * * *

9. Sections 21(m) and (n) and 39(g) were added by Public Act 81-1484 and became effective July 1, 1980.

10. Over the history of the operation of the Refinery, contaminants including gasoline and other petroleum products have leaked and percolated from Refinery facilities, including pipelines, waste storage and disposal operations, wastewater collection and treatment units, and refining units into the ground underneath a substantial area of the Refinery. These contaminants include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant to Board regulations,

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including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge – F038. Clark Wisconsin initiated efforts to recover the released contaminants by extracting and treating contaminated groundwater within the residential areas of North Hartford. After the transfer of the Refinery to Clark Oil when Clark Wisconsin was merged into it, Clark Oil continued those efforts. After acquisition of the Refinery, Premcor continued those efforts. These efforts, conducted without supervision or input from Illinois EPA, made little, if any, headway in reducing the amount of contamination.

11. The gasoline and other contaminants contain benzene, xylene, and other compounds that, because of their chemical characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness.

12. Neither Clark Wisconsin, Clark Oil, nor Old Apex notified the Illinois EPA of the merger of Clark Wisconsin into Clark Oil and the accompanying transfer of the interest in the land underlying the Refinery where contaminants constituting hazardous waste had been disposed or obtained a permit with conditions to address the released contaminants prior to the merger and the accompanying transfer of the Refinery from Clark Wisconsin to Clark Oil in 1981 and, therefore, each has violated and continues to violate Section 21(m) and(n) of the Act, 415 ILCS 5/21(m) and (n). Apex, as successor by merger, is liable for those violations.

13. Neither Clark Oil nor Old Apex notified the Illinois EPA of the transfer of its

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interest in the land underlying the Refinery where contaminants constituting hazardous waste had been disposed or obtained a permit with conditions to address the released contaminants prior to the transfer of the Refinery to Premcor in 1988 and have, therefore, violated and continue to violate Section 21(m) of the Act, 415 ILCS 5/21(m). Apex, as successor by merger, is liable for those violations.

14. After its acquisition of the Refinery, Premcor has not applied for or obtained a permit with conditions to address the released contaminants. Premcor has violated and continues to violate Section 21(n) of the Act, 415 ILCS 5/21(n).

15. These conditions will remain, harming and threatening to harm the public health and the environment, unless Apex and Premcor are permanently enjoined to abate them.

16. There is no adequate remedy at law for these conditions. The balance of the equities favor injunctive relief. These conditions and violations will continue unabated unless enjoined by this Court.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that the Defendant, Apex Oil Company, Inc., as successor to Clark Wisconsin and Clark Oil, to be liable for the violations of Sections 21(m) and (n) of the Act, 415 ILCS 5/21(m) and (n) (2012);

B. Find that the Defendant, The Premcor Refining Group, Inc., has violated Section 21(n) of the Act, 415 ILCS 5/21(n) (2012);

C. Pursuant to its common law equitable powers and Section 42(e) of the Act, issue a

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permanent mandatory injunction directing the Defendants to comply with the requirements of Sections 21(m) and (n), respectively, and to cease and desist from further violations of the Act and associated regulations;

D. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42a) (2012), impose upon each Defendant a monetary penalty of not more than the statutory maximum;

E. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award the Plaintiff its costs in this matter, including reasonable attorney's fees and expert witness costs; and

F. Grant such other and further relief as this Court deems appropriate.

COUNT VII: LIABILITY FOR REMOVAL COSTS[7]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former

[7] Previously Count II of the Second Amended Complaint with revisions.

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owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC

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Oil & Refining Corporation) was merged into Apex.

5. Over the history of the operation of the Refinery, gasoline and other petroleum products have leaked and percolated from active Refinery facilities and Refinery facilities which ceased to be operated, including pipelines, waste storage and disposal operations, wastewater collection and treatment units, the lagoons on the River Front property, and refining units into the ground underneath a substantial area of the Refinery. Clark Wisconsin initiated efforts to recover the released contaminants by extracting and treating contaminated groundwater within the residential areas of North Hartford. After the transfer of the Refinery to Clark Oil when Clark Wisconsin was merged into it, Clark Oil continued those efforts. After acquisition of the Refinery, Premcor continued those efforts. These efforts, conducted without supervision or input from Illinois EPA, made little, if any, headway in reducing the amount of contamination.

6. The gasoline and other contaminants contain benzene, xylene, and other compounds that, because of their chemical characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness.

7. During the course of their operation of the Refinery, Clark Wisconsin and Clark Oil ceased operation of one or more pipelines within the Refinery including one set of the River Lines and a pipeline to the Former Piasa terminal. When these pipelines were abandoned, Clark Wisconsin and Clark Oil left petroleum in those lines and did not completely purge those lines or excavate and remove the lines. Over time the petroleum left in those lines leaked or seeped out as the pipelines deteriorated. The discharged petroleum commingled with the contamination present in the soil and groundwater uner the Refinery. Such discharges may have continued past

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the transfer of the Refinery to Premcor and past November 29, 1993 for years or decades.

8. During the course of their operation of the Refinery, Clark Wisconsin and Clark Oil ceased operation of one or more units within the Refinery including the lagoons on the River Front property, the Triangle Area, and the disposal area on the South Property. When these units were abandoned, Clark Wisconsin and Clark Oil left petroleum in place. Over time petroleum left in those units leaked or seeped out and continues to leak and seep out. The discharged petroleum commingled with the contamination present in the soil and groundwater under the Refinery. Such discharges may have continued past the transfer of the Refinery to Premcor and past November 29, 1993.

9. Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d) (which became effective November 29, 1993), provides that:

> A responsible party is liable for any damage or removal costs, whether present or future, resulting from or arising out of any discharge, as defined in Section 5.

10. Section 5 of the Oil Spill Responders Liability Act, 740 ILCS 113/5 (which became effective November 29, 1993), provides the following definitions:

> "Damages" means damages of any kind for which liability may exist under the laws of this State resulting from, arising out of, or related to the discharge or threatened discharge of oil.
>
> "Discharge" means an emission, other than natural seepage, intentional or unintentional, and includes, but is not limited to, spilling, leaking, pumping, pouring, emitting, emptying, or dumping.
>
> * * *
>
> "Oil" means oil of any kind or in any form, including, but not limited to, petroleum, fuel oil; sludge, oil refuse, and oil mixed with waste other than dredged spoil, but does not include petroleum, including crude oil or any fraction of crude oil, that is specifically

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listed or designated as a hazardous substance under subparagraphs (A) through (F) of Section 101(14) of the federal Comprehensive Environmental response Compensation and Liability Act (42 U.S.C. 9601) and that is subject to the provision of that Act.

"Person" means an individual, a corporation, a partnership, an association, the State, a municipality, a commission, or a political subdivision of the State, or an interstate body.

"Removal costs" means the costs of removal incurred after a discharge of oil or, when there is a substantial threat of a discharge of oil, the costs to prevent, minimize, or mitigate oil pollution from an incident.

"Responsible party" means a responsible party as defined under Section 1001 of the Oil Pollution Act of 1990, Public Law No. 101-380 (33 U.S.C. 1001).

11. Section 1001(32) of the Oil Pollution Act of 1990, 33 U.S.C. 1001(32), defines "responsible party" as:

* * *

(B) Onshore facilities

In the case of an onshore facility (other than a pipeline), any person owning or operating the facility, except a Federal agency, State, municipality, commission, or political subdivision of a State, or any interstate body, that as the owner transfers possession and right to use the property to another person by lease, assignment or permit.

* * *

(E) Pipelines

In the case of a pipeline, any person owning or operating the pipeline.

(F) Abandonment

In the case of an abandoned vessel, onshore facility, deepwater port, pipeline, or offshore facility, the persons who would have been responsible immediately prior to the abandonment of the vessel or facility.

12. The State of Illinois has incurred and will continue to incur removal costs as a result of the discharges of petroleum at the Refinery by Clark Wisconsin and Clark Oil from the

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abandoned pipelines and other units. As the owner and operator of those pipelines and other units at the time they were abandoned, Clark Oil and Clark Wisconsin are the responsible parties for the discharges occurring after November 29, 1993. Apex, as successor by merger to Clark Wisconsin and Clark Oil, is liable for the State's removal costs.

13. Since Premcor's acquisition of the Refinery and pipelines, there have been additional leaks and spills of petroleum within the Refinery. On January 12 and 13, 2005, the roof on Tank 80-11 failed resulting in the release of 80,000 gallons of gasoline on to the ground and into the air. The State of Illinois has incurred removal costs as a result of those spills and leaks. Premcor is liable for the State's removal costs.

PRAYER FOR RELIEF

WHEREFORE the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find the Defendant Apex Oil Company, Inc., as successor to Clark Wisconsin and Clark Oil, to be liable for the removal costs incurred by the State of Illinois as a result of the leaks and spills of petroleum at the Refinery pursuant to Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d);

B. Find the Defendant, The Premcor Refining Group, Inc., to be liable for the removal costs incurred by the State of Illinois as a result of the leaks and spills of petroleum at the Refinery pursuant to Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d);

C. Direct the Defendants to reimburse the State of Illinois for its removal costs incurred and to be incurred as a result of the leaks and spills of petroleum at the Refinery

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pursuant to Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d); and

D. Grant such other and further relief as this Court deems appropriate.

COUNT VIII: VIOLATION OF ILLINOIS GROUNDWATER PROTECTION ACT[8]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 2 of the Illinois Groundwater Protection Act, 415 ILCS 55/2 (effective Sept. 24, 1987) and Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on

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[8] Previously part of Count III of the Second Amended Complaint which has been revised to separate prior allegations into two Counts for purposes of clarity.

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November 16, 1989 under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC Oil & Refining Corporation) was merged into Apex.

5. During the period after its acquisition of the Refinery through its merger into Clark Oil, Clark Wisconsin discharged, deposited, dumped, spilled, leaked and placed gasoline

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and other petroleum products, sludge from waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on any land or water at various sites within the Refinery so that such materials and constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area, including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the "Triangle Area", the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

6. During the period after its acquisition of the Refinery from Clark Wisconsin, Clark Oil discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area. In 1983, Clark Oil was informed by a consultant it hired that a pool of gasoline and other petroleum totaling 9,000,000 gallons was present underneath the Refinery but Clark Oil took no action to reduce or control that contamination.

7. The gasoline, wastes, and other materials contain benzene, xylene, lead, and other

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compounds that, because of their chemical characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. These materials include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant to Board regulations because of the threat they pose to human health and the environment, including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge – F038. These contaminants render groundwater and surface water impure and prejudice others. These contaminants also generate vapors which travel through the soil and into structures and the atmosphere to the prejudice of others.

8. Clark Wisconsin allowed these contaminants to remain in place.

9. Clark Oil allowed and continues to allow these contaminants to remain in place. The sale of the Refinery did not relieve it of this liability.

10. Since Premcor's acquisition of the Refinery and pipelines, Premcor allowed and continues to allow these contaminants to remain in place. As part of its cessation of refining operations, Premcor arranged for the dismantling its former asphalt storage tanks in August of 2002. During the course of these activities, significant quantities of asphalt tank bottoms and other oily wastes were spilled onto the ground in and around the storage tank area. Premcor did not immediately clean up the spilled material. The spilled material was then tracked over a more extensive area by equipment involved in the dismantling process. On November 26, 2002,

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Premcor caused or allowed oily wastes to spill from a roll off box onto the ground at the refinery near the area where Premcor stores such wastes. Premcor did not immediately clean up the spill. There have also been additional leaks and spills of contaminants within the Refinery which Premcor allowed and continues to allow these contaminants to remain in place.

11. Section 2 of the Illinois Groundwater Protection Act, 415 ILCS 55/2 (2012), provides that:

(a) The General Assembly finds that:

(i) a large portion of Illinois' citizens rely on groundwater for personal consumption and industries use a significant amount of groundwater;

(ii) contamination of Illinois groundwater will adversely impact the health and welfare of its citizens and adversely impact the economic viability of the State;

(iii)contamination of Illinois' groundwater is occurring;

(iv) protection of groundwater is a necessity for future economic development in this State.

(b) Therefore, it is the policy of the State of Illinois to restore, protect, and enhance the groundwaters of the State as a natural and public resource. The State recognizes the essential and pervasive role of groundwater in the social and economic well-being of the people of Illinois, and its vital importance to the general, health, safety, and welfare. It is further recognized as consistent with this policy that the groundwater resources of the State be utilized for beneficial and legitimate purposes; that waste and degradation of the resources be prevented; and that the underground water resource be managed to allow the maximum benefit of the people of the State of Illinois.

12. Section 8 of the Illinois Groundwater Protection Act, 415 ILCS 55/8(2012), provides that:

(a) The [Environmental Protection] Agency, after consultation with the Committee and Council [both established by the Illinois Groundwater Protection Act, Sections 4 and 5, respectively], shall propose regulations establishing

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comprehensive groundwater quality standards which are specifically for the protection of groundwater. In preparing such regulation, the Agency shall address, to the extent feasible, those contaminants which have been found in the groundwaters of the State and which are known to cause, or are suspected of causing, cancer, birth defects, or any other adverse effect on human health according to nationally accepted guidelines. Such regulations shall be submitted to the [Illinois Pollution Control] Board by July 1, 1989.

(b) Within 2 years after the date upon which the Agency files the proposed regulations, the Board shall promulgate the water quality standards for groundwater. * * *

13. 35 Ill. Adm. Code 620.115 (2012), one of the regulations promulgated by the Board pursuant to Section 8 of the Illinois Groundwater Protection Act, 415 ILCS 55/8 (2012), provides that:

No person shall cause, threaten, or allow a violation of the Act, the IGPA ("Illinois Groundwater Protection Act) or regulations adopted by the Board thereunder, including but not limited to this Part.

14. 35 Ill. Adm. Code 620.301 , one of the regulations promulgated by the Board pursuant to Section 8 of the Illinois Groundwater Protection Act, 415 ILCS 55/8 (2012), provides that:

a) No person shall cause, threaten, or allow the release of any contaminant to a resource groundwater such that:

1) Treatment or additional treatment is necessary to continue an existing use or to assure a potential use of such groundwater; or

2) An existing or potential use of such groundwater is precluded.

* * *

15. 35 Ill. Adm. Code 620.405 (2012), one of the regulations promulgated by the Board pursuant to Section 8 of the Illinois Groundwater Protection Act, 415 ILCS 55/8 (2012),

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provides that:

a) No person shall cause, threaten, or allow the release of any contaminant to groundwater so as to cause a groundwater quality standard set forth in this subpart to be exceeded.

16. 35 Ill. Adm. Code 620.410 (2012), one of the regulations promulgated by the Board pursuant to Section 8 of the Illinois Groundwater Protection Act, 415 ILCS 55/8 (2012), provides that:

a) Inorganic Chemical Constituents

Except due to natural causes or as provided in Section 620.450, concentrations of the following chemical constituents must not be exceeded in Class I groundwater:

CONSTITUENT	UNIT	STANDARD
Antimony	mg/l	0.002
Arsenic	mg/l	0.003
* * *		
Iron	mg/l	5
Lead	mg/l	0.0075
Manganese	mg/l	0.15
* * *		
Nickel	mg/l	0.1
* * *		

b) Organic Chemical Constituents

Except due to natural causes or as provided in Section 620.450, concentrations of the following organic chemical constituents must not be exceeded in Class I groundwater:

CONSTITUENT	UNIT	STANDARD
* * *		
Benzene	mg/l	0.005

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* * *		
Ethylbenzene	mg/l	0.7
* * *		
Toluene	mg/l	1
* * *		
Xylene	mg/l	10

* * *

16. Section 12 of the Act, 415 ILCS 5/12 (2012), provides, in pertinent part, that:

No person shall:

(a) Cause or threaten or allow the discharge of any contaminants into the environment in any State so as to cause or tend to cause water pollution in Illinois, either alone or in combination with matter from other sources, or so as to violate regulations or standards adopted by the Pollution Control Board under this Act;

(b) Construct, install, or operate any equipment, facility, vessel, or aircraft capable of causing or contributing to water pollution, of any type designated by Board regulations, without a permit granted by the Agency, or in violation of any permit granted by such permit.

* * *

(d) Deposit any contaminants upon the land in such place and manner so as to create a water pollution hazard.

* * *

17. For a period of time better known to Clark Wisconsin and Clark Oil, each caused or allowed contaminants to be placed on or in the ground. After September 24, 1987, Clark Oil allowed these contaminants previously placed on or in the ground to enter the groundwater under and in the vicinity of the Hartford Refinery resulting in the presence of concentrations of benzene, ethylbenzene, toluene, and xylene in excess of the standards set forth in 35 Ill. Adm.

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Code 620.410(b), and, by doing so, violated and continues to violate Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(b). Apex, as successor by merger, is liable for those violations.

18. For a period of time better known to Clark Wisconsin and Clark Oil, each has caused or allowed contaminants to be placed on or in the ground. After September 24, 1987, Clark Oil allowed these contaminants previously placed on or in the ground to enter the groundwater under and in the vicinity of the Hartford refinery resulting in the presence of concentrations of antimony, arsenic, iron, lead, manganese, and nickel in excess of the standards set forth in 35 Ill. Adm. Code 620.410(a), and, by doing so, has violated and continues to violate Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(a). Apex, as successor by merger, is liable for those violations.

19. For a period of time better known to Premcor, Premcor has caused or allowed contaminants previously placed on or in the ground to enter the groundwater under and in the vicinity of the Hartford refinery resulting in the presence of concentrations of benzene, ethylbenzene, toluene, and xylene in excess of the standards set forth in 35 Ill. Adm. Code 620.410(b). By doing so, Premcor violated and continues to violate Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(b).

20. For a period of time better known to Premcor, Premcor caused or allowed contaminants to be placed on or in the ground and, thereafter, allowed these contaminants to enter the groundwater under and in the vicinity of the Hartford refinery resulting in the presence of concentrations of benzene, ethylbenzene, toluene, and xylene in excess of the standards set forth in 35 Ill. Adm. Code 620.410(b). By doing so, Premcor violated and continues to violate

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Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(b).

21. For a period of time better known to Premcor, Premcor has caused or allowed contaminants previously placed on or in the ground to enter the groundwater under and in the vicinity of the Hartford refinery resulting in the presence of concentrations of antimony, arsenic, iron, lead, manganese, and nickel in excess of the standards set forth in 35 Ill. Adm. Code 620.410(a). By doing so, Premcor has violated and continues to violate Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(a).

22. For a period of time better known to Premcor, Premcor caused or allowed contaminants to be placed on or in the ground and, thereafter, allowed these contaminants to enter the groundwater under and in the vicinity of the Hartford refinery resulting in the presence of concentrations of antimony, arsenic, iron, lead, manganese, and nickel in excess of the standards set forth in 35 Ill. Adm. Code 620.410(a). By doing so, Premcor has violated and continues to violate Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(a).

23. These conditions will remain, harming and threatening to harm the public health and the environment, unless Apex and Premcor are permanently enjoined to abate them.

24. There is no adequate remedy at law for these conditions. The balance of the equities favor injunctive relief.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully request that this Court grant the following relief:

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A. Find that Defendants, The Premcor Refining Group, Inc., and Apex Oil Company, as successor to Clark Wisconsin and Clark Oil, are liable for the violations of Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(b);

B. Pursuant to Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendants to cease and desist from further violations of the Act and associated regulations and, pursuant to its common law equitable powers issue a mandatory permanent injunction directing the Defendants to properly restore the groundwater;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon the Defendants a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter, including reasonable attorney fees and expert witness costs; and

E. Grant to Plaintiff such other and further relief as this Court deems appropriate.

COUNT IX: WATER POLLUTION HAZARD[9]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the

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[9] Previously part of Count III of the Second Amended Complaint which has been revised to separate prior allegations into two Counts for purposes of clarity and to include allegations from Count VIII of the Second Amended Complaint for purposes of brevity.

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public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Defendant Apex Oil Company, Inc. ("Apex"), is a corporation incorporated on November 16, 1989 under the laws of the State of Missouri which is qualified to do business in the State of Illinois. Apex is the successor by merger to two other entities which were involved in the ownership of the Refinery and associated pipelines. The first entity was Clark Oil & Refining Corporation, a Wisconsin corporation ("Clark Wisconsin"), and the second was Apex Acquisition, Inc., which later changed its name to Clark Oil & Refining Corporation ("Clark Oil"). Clark Wisconsin acquired the Refinery and associated pipelines in 1967 and operated them until 1981. In that year, Clark Wisconsin was merged into and all of its property including the Refinery and associated pipelines were transferred to Clark Oil (then operating under the Apex Acquisition, Inc., name). Clark Oil was a wholly-owned indirect subsidiary of Apex Oil Company, a Missouri general partnership ("Old Apex"). Clark Oil managed operations on its terminal on the South Property separately from its refining operations. In December 1987, Old Apex and most of its subsidiaries, including Clark Oil, filed a bankruptcy petition under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court of the Eastern District of

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Missouri. In November of 1988, as part of the bankruptcy proceedings, Clark Oil transferred assets including the Refinery and associated pipelines to AOC Acquisition Corporation, a Delaware corporation. After the sale, AOC Acquisition Company changed its name to Clark Oil & Refining Corporation, a Delaware corporation, and then to Clark Refining and Marketing, Inc., and then to its present name, as noted above. Two of the principals in Old Apex were significant shareholders of AOC Acquisition Company. On December 12, 1989, Clark Oil (then named "OC Oil & Refining Corporation) was merged into Apex.

5. During the period after its acquisition of the Refinery through its merger into Clark Oil, Clark Wisconsin discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on any land or water at various sites within the Refinery so that such materials and constituents thereof entered into the environment or were emitted into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area, including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the "Triangle Area", the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area.

6. During the period after its acquisition of the Refinery from Clark Wisconsin, Clark Oil discharged, deposited, dumped, spilled, leaked and placed gasoline and other petroleum products, sludge from a waste treatment, and other solid, liquid, or semi-solid material resulting from its Refinery operations into or on the land at various sites within the Refinery so that such materials and many constituents thereof entered into the environment or were emitted

into the air or discharged into any waters, including ground waters at the Refinery. The sites include the piping and pipeline corridors, the slop oil tanks area including tanks 10-1 and 10-6, the wastewater treatment plant area, the areas within the Tank Farm containment berms, the disposal area in the South Property, the stormwater sewers, the Oily Process sewers, the Guard Basin, and the three waste water lagoons in the River Dock Area. In 1983, Clark Oil was informed by a consultant it hired that a pool of gasoline and other petroleum totaling 9,000,000 gallons was present underneath the Refinery but Clark Oil took no action to reduce or control that contamination.

7. The gasoline, wastes, and other materials contain benzene, xylene, lead, and other compounds that, because of their chemical characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible, illness. These materials include materials which have been listed as hazardous wastes pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976, P.L. 94-580, or pursuant to Board regulations because of the threat they pose to human health and the environment, including Dissolved Air Flotation (DAF) – K048, Slop Oil Emulsion Solids – K049, Heat Exchanger Bundle Cleaning Sludge – K050, API Separator Sludge –K051, Tank Bottoms (leaded) – K052, Petroleum Refinery Primary Oil/Water/Solids Separation Sludge – F037, and Petroleum Refinery Secondary (emulsified) Oil/Water/Solids Separation Sludge – F038. These contaminants render groundwater and surface water impure and prejudice others. These contaminants also generate vapors which travel through the soil and into structures and the atmosphere to the prejudice of others.

8. Clark Wisconsin allowed these contaminants to remain in place.

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9. Clark Oil allowed and continues to allow these contaminants to remain in place. The sale of the Refinery did not relieve it of this liability.

10. Since Premcor's acquisition of the Refinery and pipelines, Premcor allowed and continues to allow these contaminants to remain in place. As part of its cessation of refining operations, Premcor arranged for the dismantling its former asphalt storage tanks in August of 2002. During the course of these activities, significant quantities of asphalt tank bottoms and other oily wastes were spilled onto the ground in and around the storage tank area. Premcor did not immediately clean up the spilled material. The spilled material was then tracked over a more extensive area by equipment involved in the dismantling process. On November 26, 2002, Premcor caused or allowed oily wastes to spill from a roll off box onto the ground at the refinery near the area where Premcor stores such wastes. Premcor did not immediately clean up the spill. There have also been additional leaks and spills of contaminants within the Refinery which Premcor allowed and continues to allow these contaminants to remain in place.

11. Section 12 of the Act, 415 ILCS 5/12 (2012), provides, in pertinent part, that:

No person shall:

(a) Cause or threaten or allow the discharge of any contaminants into the environment in any State so as to cause or tend to cause water pollution in Illinois, either alone or in combination with matter from other sources, or so as to violate regulations or standards adopted by the Pollution Control Board under this Act;

(b) Construct, install, or operate any equipment, facility, vessel, or aircraft capable of causing or contributing to water pollution, of any type designated by Board regulations, without a permit granted by the Agency, or in violation of any permit granted by such permit.

* * *

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(d) Deposit any contaminants upon the land in such place and manner so as to create a water pollution hazard.

* * *

12. The Act provides the following definitions:

Section 3.550 of the Act, 415 ILCS 5/3.550 (2012), provides that:

> "WATERS" means all accumulations of water, surface and underground, natural and artificial, public and private, or parts thereof, which are wholly or partially within, flow through, or border upon this State.

Section 3.545 of the Act, 415 ILCS 5/3.545 (2012), provides that:

> "WATER POLLUTION" is such alteration of the physical, thermal, chemical , biological or radioactive properties of any waters of the State, or such discharge of any contaminant into any waters of the State, as will or is likely to create a nuisance or render such waters harmful or detrimental or injurious to public health, safety or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate uses, or the livestock, wild animals, birds, fish, or other aquatic life.

13. For a period of time better known to Clark Wisconsin and Clark Oil, each caused or allowed contaminants to be placed on or in the ground and to enter the groundwater under and in the vicinity of the Hartford Refinery and, by doing so, each has violated and continues to violate Sections 12(a) and (d) of the Act, 415 ILCS 5/12(a) and (d). Apex, as successor by merger, is liable for those violations.

14. For a period of time better known to Premcor, Premcor caused or allowed contaminants to be placed on or in the ground and to enter the groundwater under and in the vicinity of the Hartford refinery. By doing so, Premcor violated and continues to violate Sections 12(a) and (d) of the Act, 415 ILCS 5/12(a) and (d).

15. These conditions will remain, harming and threatening to harm the public health

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and the environment, unless Apex and Premcor are permanently enjoined to abate them.

16. There is no adequate remedy at law for these conditions. The balance of the equities favor injunctive relief.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully request that this Court grant the following relief:

A. Find that Defendants, The Premcor Refining Group, Inc., and Apex Oil Company, as successor to Clark Wisconsin and Clark Oil, are liable for the violations of Sections 12(a) and (d) of the Act, 415 ILCS 5/12(a) and (d);

B. Pursuant to Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendants to cease and desist from further violations of the Act and associated regulations and, pursuant to its common law equitable powers issue a mandatory permanent injunction directing the Defendants to properly abate the water pollution and the water pollution hazard;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon the Defendants a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter, including reasonable attorney fees and expert witness costs; and

E. Grant to Plaintiff such other and further relief as this Court deems appropriate.

COUNT X: HAZARDOUS WASTE DISPOSAL VIOLATIONS[10]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request

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[10] Previously Count IV of the Second Amended Complaint with revisions.

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of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Section 21 of the Act, 415 ILCS 5/21 (2012), provides, in pertinent part, as follows:

> No person shall:
>
> a. Cause or allow the open dumping of any waste;
>
> * * *
>
> d. Conduct any waste-storage, waste-treatment, or waste-disposal operation:
>
> * * *
>
> 2. In violation of any regulations or standards adopted by the Board under this Act; or
>
> e. Dispose, treat, store or abandon any waste, * * *, except at a site or facility

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which meets the requirements of this Act and of the regulations and standards thereunder.

f. Conduct any hazardous waste-storage, hazardous waste-treatment, or hazardous waste-disposal operation:

1. Without a RCRA permit for the site issued by the Agency under subsection (d) of Section 39 of this Act or in violation of any conditions imposed by such permit * * *; or

2. In violation of any regulations or standards adopted by the Board under this Act; or

* * *

5. 35 Ill. Adm. Code 703.121 (2012) provides that:

a. No person shall conduct any hazardous waste storage, hazardous waste treatment, or hazardous waste disposal operation:

1. Without a RCRA permit for the HWM (hazardous waste management) facility; or

2. In violation of any condition imposed by a RCRA permit;

* * *

6. 35 Ill. Adm. Code 722.134 (2012) provides that:

a. Except as provided in subsections (d), (e), 0r (f), below, a generator is exempt from all the requirements in 35 Ill. Adm. Code 725, Subparts G and H, except for 35 Ill. Adm. Code 725.111 and 725.214 and may accumulate hazardous waste on-site for 90 days or less without a permit or without having interim status provided that:

1) The waste is placed:

A) In containers and the generator complies with 35 Ill. Adm. Code 725, Subpart I; * * *

2) The date upon which each period of accumulation begins is clearly marked and visible for inspection on each container;

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3) While being accumulated on-site, each container and tank is labeled or marked clearly with the words "Hazardous Waste"; and

4) The generator complies with the requirements for owners and operators in 35 Ill. Adm. Code 725, Subparts C and D and 35 Ill. Adm. Code 725.116 and 728.107(a)(4).

b. A generator who accumulates hazardous waste for more than 90 days is an operator of a storage facility and is subject to the requirements of 35 Ill. Adm. Code 724 and 725 and the permit requirements of 35 Ill. Adm. Code 702, 703 and 705 unless the generator has been granted an extension of the 90-day period. If hazardous wastes must remain on-site for longer than 90 days due to unforeseen, temporary, and uncontrollable circumstances, the generator may seek an extension of up to 30 days by means of a variance or provisional variance, pursuant to Section 37 of the Environmental Protection Act.

* * *

7. 35 Ill. Adm. Code 725.131 (2012) provides that:

Facilities must be maintained and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to the air, soil, or surface water which could threaten human health or the environment.

8. 35 Ill. Adm. Code 725.151 (2012) provides that:

a) Each owner or operator must have a contingency plan for this facility. The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to air, soil or surface water.

b) The provisions of the plan must be carried out immediately whenever there is a fire, explosion or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

9. 35 Ill. Adm. Code 725.274 (2012) provides that:

The owner or operator must inspect areas where containers are stored at least weekly, looking for leaks and deterioration caused by corrosion or other factors.

10. In its Refinery operations, Premcor generated, handled, and stored large quantities

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of wastes, including wastes listed as hazardous wastes pursuant to 35 Ill. Adm. Code Part 721. The wastes generated include dissolved air float (hazardous waste listed as K048), slop oil emulsion solids (hazardous waste listed as K049), primary and secondary oil/water separation sludge (hazardous waste listed as F037 and F038, respectively), heat exchanger bundle sludge (hazardous waste listed as K050), spent hydrotreating catalyst (hazardous waste listed as K171), and laboratory wastes.

11. On a date prior to March 7, 2001, better known to Premcor, sludge and contaminated water from a line conveying primary and secondary wastewater separation sludge to the dissolved air flotation unit leaked or spilled, resulting in the accumulation of primary and secondary wastewater separation sludge (F037 and F038) and on the ground and contamination of the underlying soil. Premcor did not immediately clean up the release, choosing instead to let it lay there for more than three weeks. By doing so, Premcor has violated Sections 21(a), (e) and (f) of the Act, 415 ILCS 5/21(a), (e), and (f) (2012), and 35 Ill. Adm. Code 703.121(a), 725.131, 725.151(b), and 725.212(a) (2012).

12. On a date prior to February 20, 2001, better known to Premcor, sludge and oily liquid leaked or spilled from a number of roll off boxes containing primary and secondary wastewater separation sludge (F037 and F038) and slop oil emulsion solids (hazardous waste listed as K049) generated at the Hartford refinery, and ACFM centrifuge sludge (K169) generated at the Hartford refinery and at Premcor's Blue Island refinery onto the ground, resulting in the accumulation of sludge and oily liquid on the ground and soil contamination. Premcor did not immediately clean up these releases. Additional releases occurred during the time between February 20 and March 7, 2001. By doing so, Premcor has violated Sections 21(a),

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(e) and (f) of the Act, 415 ILCS 5/21(a), (e), and (f) (2012), and 35 Ill. Adm. Code 703.121(a), 725.131, 725.151(b), and 725.212(a) (2012). Had Premcor properly managed these wastes they could have been recycled in Premcor's coker unit and would not have been subject to regulation.

13. Premcor did not conduct inspections of the wastes accumulated in the roll off boxes in a manner which identified the leakage or the accumulation of sludge on the ground or the contamination of the underlying soil. By doing so, Premcor has violated Section 21(f)(2) of the Act, 415 ILCS 5/21(f)(2) (2012), and 35 Ill. Adm. Code 725.274 (2012).

14. During the period of November 19-26, 2002, Premcor failed to properly manage spent hydrotreating catalyst (K171) being stored in roll off boxes in its hazardous waste storage area resulting in the spillage of several gallons of the waste outside of the roll off box. Premcor also failed to keep a second roll off box covered. By doing so, Premcor has violated Sections 21(a), (e) and (f) of the Act, 415 ILCS 5/21(a), (e), and (f) (2012), and 35 Ill. Adm. Code 703.121(a), 725.131 725.151(b), and 725.212(a) (2012).

15. Premcor did not conduct inspections of the spent hydrotreating catalyst (K171) accumulated in the roll off boxes in a manner which identified the leakage or the accumulation of spent hydrotreating catalyst (K171) on the ground. By doing so, Premcor has violated Section 21(f)(2) of the Act, 415 ILCS 5/21(f)(2) (2012), and 35 Ill. Adm. Code 725.274 (2012).

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, ex rel. Lisa Madigan, Attorney General of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that the Defendant, The Premcor Refining Group, Inc. has violated Section

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21 of the Act, 415 ILCS 5/21 (2012), and 35 Ill. Adm. Code 703.121(a), 725.131, 725.151(b), 725.212(a), and 725.274 (2012);

B. Enjoin Defendant, The Premcor Refining Group, Inc. to cease and desist from further violations of Section 21 of the Act, 415 ILCS 5/21 (2012), and the associated Pollution Control Board regulations, to properly close the areas of concern in accordance with 35 Ill. Adm. Code Part 725 and a RCRA closure/post-closure permit;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon Defendant the maximum statutory penalty authorized;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter including attorneys' fees and expert witness costs; and

E. Grant such other and further relief as the Court deems appropriate.

COUNT XI: THREATENING AIR POLLUTION[11]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

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[11] Previously Count V of the Second Amended Complaint.

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3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Section 9 of the Act, 415 ILCS 5/9 (2012), provides that:

No person shall:

a. Cause or threaten or allow the discharge or emission of any contaminant into the environment in any State so as to cause or tend to cause air pollution in Illinois, either alone or in combination with contaminants from other sources, or so as to violate regulations or standards adopted by the Board under this Act;

b. Construct, install, or operate any equipment, facility, vehicle, vessel, or aircraft capable of causing or contributing to air pollution or designed to prevent air pollution, of any type designated by Board regulations, without a permit granted by the Agency, or in violation of any conditions imposed by such permit;

* * *

5. On November 8, 1995, a sample line nipple located in the Alkylation unit at the Refinery broke when a pipefitter attempted to make a connection to it. The sample line nipple failed because of internal corrosion.

6. When the sample line nipple failed it released a gaseous mixture containing Hydrogen Fluoride. Hydrogen Fluoride is extremely corrosive, even in very small quantities, and potentially deadly. The pipefitter was treated at Alton Memorial Hospital for minor injuries. Hawthorne Street near the Refinery was closed to traffic for approximately fifteen minutes as a

precaution while measures to terminate the release and control the vapor were implemented.

7. By causing or allowing uncontrolled emissions of Hydrogen Fluoride as described above, Premcor violated Section 9(a) of the Act, 415 ILCS 5/9(a) (2012).

8. During the period of January 12-13, 2005, the floating roof on gasoline storage tank (#80-11) failed resulting in the release of more than 80,000 gallons of gasoline onto the ground and into the air. For a period of time, the gasoline vapors reached potentially explosive levels.

9. By causing or allowing uncontrolled emissions of gasoline vapors as described above, Premcor violated Section 9(a) of the Act, 415 ILCS 5/9(a) (2012).

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that the Defendant, The Premcor Refining Group, Inc., has violated Section 9(a) of the Act, 415 ILCS 5/9(a) (2012);

B. Pursuant to Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendant from further violations of the Act and associated regulations;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42a) (2012), impose upon the Defendant a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award the Plaintiff its costs in this matter, including reasonable attorney's fees and expert witness costs; and

E. Grant such other and further relief as this Court deems appropriate.

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COUNT XII: EXCESSIVE EMISSIONS[12]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Section 9 of the Act, 415 ILCS 5/9 (2012), provides that:

No person shall:

a) Cause, threaten or allow the discharge or emission of any contaminant into the environment in any State so as to cause or tend to cause air pollution in Illinois, either alone or in combination with contaminants from other sources, or so as to violate regulations or standards adopted by the Board under this Act;

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[12] Previously Count VI of the Second Amended Complaint with revisions.

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* * *

5. 35 Ill. Adm. Code 212.381 (2012) provides that:

> Sections 212.321 and 212.322 shall not apply to catalyst regenerators of fluidized catalytic converters. No person shall cause or allow the emission rate from new and existing catalyst regenerators of fluidized catalytic converters to exceed in any one hour period the rate determined using the following equations
>
> $E = 4.10(P)^{0.67}$ for P less than or equal to 30 tons per hour,
>
> $E = (55.0(P)^{0.11}) - 40.0$ for P greater than 30 tons per hour,
>
> where E = allowable emission rate in pounds per hour, and P = catalyst recycle rate, including the amount of fresh catalyst added, in tons per hour.

6. Since its acquisition of the Refinery, Premcor operated a catalyst regenerator for its fluidized catalytic converter. The catalyst regenerator was a source of emissions of particulate matter.

7. For a period of time during the spring and summer of 2000, including July 21, 2000, Premcor allowed particulate matter to be emitted from the catalyst regenerator in excess of the emission limits established under 35 Ill. Adm. Code 212.381. By doing so, Premcor violated Section 9(a) of the Act, 415 ILCS 5/9(a), and 35 Ill. Adm. Code 212.381.

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully request that this Court grant the following relief:

A. Find that Defendant, The Premcor Refining Group, Inc., has violated Section 9(a) of the Act, 415 ILCS 5/9(a) (2012), and 35 Ill. Adm. Code 212.381;

B. Pursuant to Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendant from further violations of the Act and associated regulations after any further

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hearing upon and adjudication of violations;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon the Defendant a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter, including reasonable attorney fees and expert witness costs; and

E. Grant to Plaintiff such other and further relief as this Court deems appropriate.

COUNT XIII: MISMANAGEMENT OF WASTES[13]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford,

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[13] Previously Count VII of the Second Amended Complaint with revisions.

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Madison County, Illinois (the "Refinery").

4. Section 21 of the Act, 415 ILCS 5/21 (2012), provides, in pertinent part, as follows:

> No person shall:
>
> a. Cause or allow the open dumping of any waste;
>
> * * *
>
> d. Conduct any waste-storage, waste-treatment, or waste-disposal operation:
>
> * * *
>
> 2. In violation of any regulations or standards adopted by the Board under this Act; or
>
> e. Dispose, treat, store or abandon any waste, * * *, except at a site or facility which meets the requirements of this Act and of the regulations and standards thereunder.
>
> f. Conduct any hazardous waste-storage, hazardous waste-treatment, or hazardous waste-disposal operation:
>
> 1. Without a RCRA permit for the site issued by the Agency under subsection (d) of Section 39 of this Act or in violation of any conditions imposed by such permit * * *; or
>
> 2. In violation of any regulations or standards adopted by the Board under this Act; or
>
> * * *

5. As part of its cessation of refining operations, Premcor arranged for the dismantling its former asphalt storage tanks in August of 2002. During the course of these activities, significant quantities of asphalt tank bottoms and other oily wastes were spilled onto the ground in and around the storage tank area. Premcor did not immediately clean up the spilled material. The spilled material was then tracked over a more extensive area by equipment

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involved in the dismantling process.

6. By causing or allowing the asphalt tank bottoms and other oily wastes to be spilled upon the ground without immediately cleaning it up, Premcor has violated Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e) (2012).

7. On November 26, 2002, Premcor caused or allowed oily wastes to spill from a roll off box onto the ground at the refinery near the area where Premcor stores such wastes. Premcor did not immediately clean up the spill.

8. By causing or allowing the oily wastes to be spilled upon the ground without immediately cleaning it up, Premcor has violated Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e) (2012).

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully request that this Court grant the following relief:

A. Find that Defendant, The Premcor Refining Group, Inc., has violated Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e) (2012);

B. Pursuant to Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendant to cease and desist from further violations of the Act and associated regulations and to properly remediate all contamination resulting from these releases;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon the Defendant a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter, including reasonable attorney fees and expert witness costs; and

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E. Grant to Plaintiff such other and further relief as this Court deems appropriate.

COUNT XIV: FAILURE TO OBTAIN PERMIT[14]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. Section 12 of the Act, 415 ILCS 5/12(a) (2012), provides, in pertinent part, that:

No person shall:

(a) Cause or threaten or allow the discharge of any contaminants into the environment in any State so as to cause or tend to cause water pollution in Illinois, either alone or in combination with matter from other sources, or

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[14] Previously Count IX of the Second Amended Complaint with revisions.

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so as to violate regulations or standards adopted by the Pollution Control Board under this Act;

(b) Construct, install, or operate any equipment, facility, vessel, or aircraft capable of causing or contributing to water pollution, of any type designated by Board regulations, without a permit granted by the Agency, or in violation of any permit granted by such permit.

* * *

(d) Deposit any contaminants upon the land in such place and manner so as to create a water pollution hazard.

* * *

5. 35 Ill. Adm. Code 309.202 (2012) provides that:

Except for treatment works or wastewater sources which have or will have discharges for which NPDES permits are required, and for which NPDES permits have been issued by the Agency:

a) No person shall cause or allow the construction of any new treatment works, sewer, or wastewater source or cause or allow the modification of any existing treatment works, sewer, or wastewater source without a construction permit issued by the Agency, except as provided in paragraph (b).

6. Prior to March 19, 2004, at a time better known only to Premcor, Premcor constructed connections between its administration building and several remote control room facilities and the Village of Hartford wastewater collection system to dispose of sanitary wastewaters.

7. Premcor did not apply for or obtain a construction permit from Illinois EPA prior to constructing the connections or commencing the discharge of sanitary wastewaters. None of the exceptions set forth in 35 Ill. Adm. Code 309.202(b) apply to this work or discharge. By doing so, Premcor has violated and will continue to violate Section 12(b) of the Act, 415 ILCS

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5/12(b) (2012), and 35 Ill. Adm. Code 309.202(a) (2012).

PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully request that this Court grant the following relief:

A. Find that Defendant, The Premcor Refining Group, Inc., has violated Section 12(b) of the Act, 415 ILCS 5/12(b) (2012), and 35 Ill. Adm. Code 309.202(a) (2012).

B. Pursuant to Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendant to cease and desist from any further violations of the Act and associated regulations and to properly remediate all contamination resulting from these releases;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon the Defendant a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter, including reasonable attorney fees and expert witness costs; and

E. Grant to Plaintiff such other and further relief as this Court deems appropriate.

COUNT XV: FAILURE TO PROPERLY OPERATE AND MAINTAIN TANK 80-11[15]

1. This Complaint is brought on behalf of the People of the State of Illinois, *ex rel.* Lisa Madigan, the Attorney General of the State of Illinois, on her own motion, and at the request of the Illinois Environmental Protection Agency ("Illinois EPA"), pursuant to Section 42 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/42(d) and (e) (2012),and by Thomas D. Gibbons, Madison County State's Attorney on his own motion.

2. The Attorney General and the State's Attorney are each a Constitutional Officer of

[15] Previously Count X of the Second Amended Complaint with revisions.

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the State of Illinois charged with the common law and statutory duty to act on behalf of the public interest of the People of the State of Illinois. The County of Madison is organized and exists under the laws of Illinois.

3. Defendant The Premcor Refining Group, Inc. ("Premcor"), is a corporation organized under the laws of the State of Delaware which is qualified to do business in the State of Illinois. Premcor is the current owner of an oil refinery, several storage tanks and related facilities within an area called the "South Property", and associated pipelines and the former owner of a terminal located within a portion of the South Property, all located in Hartford, Madison County, Illinois (the "Refinery").

4. 35 Ill. Adm. Code 219.121 (2012) provides that:

> No person shall cause or allow the storage of any volatile petroleum liquid (VPL) with a vapor pressure of 10.34 kPa (1.5 psia) or greater at 294.3°K (70°F) or any gaseous organic material in any stationary tank, reservoir or other container of more than 151 cubic meters (40,000 gal.) capacity unless such tank, reservoir or other container:
>
> * * *
>
> b) Is designed and equipped with one of the following vapor loss control devices:
>
> 1) A floating roof which rests on the surface of the VPL * * *

5. 35 Ill. Adm. Code 219.123(b) (2012) provides that:

> Subject to subsection (a) of this Section no owner or operator of a stationary storage tank shall cause or allow the storage of any VOL [volatile organic liquid] in the tank unless:
>
> (1) The tank is equipped with one of the vapor loss control devices specified in Section 219.121(b) of this Part;
>
> (2) There are no visible holes, tears or other defects in the seal or seal fabric or material of any floating roof;

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* * *

6. The Standard Conditions of the Air Operating Permit applicable to Premcor's storage tanks provides that:

* * *

(6) The permittee shall maintain the equipment in such a manner that the performance of such equipment shall not cause a violation of the Environmental Protection Act or Regulations promulgated thereunder.

(7) The permittee shall maintain a maintenance record on the premises for each item of air pollution control equipment. This record shall be available to any agent of the Environmental Protection Agency at any time during normal working and/or operating hours. The record shall show, as a minimum, the :

(a) date of performance of, and nature of, preventative maintenance, and

(b) date of any malfunction or breakdown and the nature of repairs to, or corrective measures performed to maintain the performance of the equipment.

* * *

7. For a period of time better known only to Premcor, Premcor has failed to properly maintain the floating roof on Tank 80-11 by failing to remove accumulations of precipitation thereby violating Standard Condition 6 of its Air Operating Permit, 35 Ill. Adm. Code 219. 121(b)(1) and 219.123(b)(1) and (2), and Sections 9(a) and (b) of the Act, 415 ILCS 5/9(a) and (b) (2012).

8. For a period of time better known only to Premcor, Premcor has failed to properly maintain a maintenance record showing the date of its removal of accumulations of precipitation from floating roofs on its storage tanks thereby violating Standard Condition 7 of its Air Operating Permit and Section 9(b) of the Act, 415 ILCS 5/9(b) (2012).

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PRAYER FOR RELIEF

WHEREFORE, the Plaintiff, People of the State of Illinois, respectfully requests that this Court grant the following relief:

A. Find that Defendant, The Premcor Refining Group, Inc., has violated Sections 9(a) and (b) of the Act, 415 ILCS 5/9(a) and (b) (2012) and 35 Ill. Adm. Code 219.121(b)(1) and 219.123(b)(1) and (2);

B. Pursuant to Section 42(e) of the Act, 415 ILCS 5/42(e) (2012), permanently enjoin the Defendant to cease and desist from any further violations of the Act and associated regulations and to properly remediate all contamination resulting from these violations;

C. Pursuant to Section 42(a) of the Act, 415 ILCS 5/42(a) (2012), impose upon the Defendant a monetary penalty of not more than the statutory maximum;

D. Pursuant to Section 42(f) of the Act, 415 ILCS 5/42(f) (2012), award Plaintiff its costs in this matter, including reasonable attorney fees and expert witness costs; and

E. Grant to Plaintiff such other and further relief as this Court deems appropriate.

Respectfully submitted,

PEOPLE OF THE STATE OF ILLINOIS,
ex rel. Lisa Madigan,
Attorney General
of the State of Illinois,

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

BY: James L Morgan

James L. Morgan
Assistant Attorney General
Environmental Bureau
500 South Second Street
Springfield, Illinois 62706
217/524-7506
Reg. # 6183865

and ex rel. Thomas D. Gibbons
State's Attorney
Madison County, Illinois

Philip Alfeld
Assistant State's Attorney
Madison County Courthouse
157 North Main Street, Suite 402
Edwardsville, IL 62025
618-692-6280
Reg. No. 3128611

Dated: May 30, 2013.

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing Third Amended Complaint was sent via electronic mail, on this 30th day of May, 2013 to the following:

Deirdre C. Gallagher dgallagher@foleymansfield.com
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and a courtesy copy was sent to: the Honorable Barbara Crowder via e-mail

James L. Morgan

James L. Morgan, #6183865
Assistant Attorney General
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Office of the Attorney General
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IN THE CIRCUIT COURT FOR THE THIRD JUDICIAL CIRCUIT
MADISON COUNTY, ILLINOIS

FILED
JUL 26 2018
CLERK OF CIRCUIT COURT #66
THIRD JUDICIAL CIRCUIT
MADISON COUNTY, ILLINOIS

PEOPLE OF THE STATE OF ILLINOIS, ex rel. LISA MADIGAN, Attorney General of the State of Illinois, and THOMAS D. GIBBONS, Madison County State's Attorney,	)	
Plaintiff,	)	
v.	)	No. 03-CH-459
THE PREMCOR REFINING GROUP INC., a Delaware Corporation, and APEX OIL COMPANY, INC., a Delaware Corporation, et al.,	)	
Defendants.	)	

CONSENT ORDER

Plaintiff, the People of the State of Illinois, *ex rel.* Lisa Madigan, Attorney General of the State of Illinois, and Thomas D. Gibbons, Madison County State's Attorney, on behalf of the Illinois Environmental Protection Agency ("Illinois EPA") (collectively, the "State"), and Defendant, The Premcor Refining Group Inc. ("Premcor"), a Delaware corporation (hereinafter collectively "Parties"), have agreed to the making of this Consent Order to resolve the entirety of the claims, as set forth herein, against Premcor remaining in the State's Third Amended Complaint. Pursuant to their Joint Motion for Good Faith Finding and Entry of Consent Order filed herewith ("Joint Motion"), the Parties hereby submit this Consent Order to this Court for approval and entry.

Although no findings of fact or law with respect to the State's Third Amended Complaint are being made herein, the State and Premcor agree the statement of facts contained herein represents a fair summary of evidence and testimony, relating to the State's claims against

Premcor remaining in the State's Third Amended Complaint and the status of the litigation, which may be introduced by the State and Premcor if a trial were to be held. The Parties further stipulate this Consent Order does not make any findings of fact; the statement of facts herein is made and agreed upon for purposes of settlement only. Neither the fact that a party has entered into this Consent Order, nor any of the facts stipulated herein, nor any payments made pursuant to this Consent Order, shall be used as evidence of or construed as an admission of Premcor's liability or responsibility for contamination at the Facility (as defined below) in any other proceeding conducted before this or any other court or administrative body, including, but not limited to, proceedings at the Illinois Pollution Control Board, federal proceedings, and proceedings involving claims against the Third-Party Defendants, as further defined below, except to enforce the terms hereof by the Parties to this Consent Order or as expressly provided herein.

Additionally, the Parties stipulate that this Consent Order and the Work (as defined below) performed pursuant to this Consent Order serve the public interest and public policy of Illinois, conserve the State's resources, and will address and eliminate any alleged substantial endangerment to the environment, health, safety and welfare of the public, and entering this Consent Order is in the best interest of the people of Illinois. Upon the Court's approval and entry of this Consent Order, the Parties each agree to be bound by this Consent Order and not to contest its validity herein in any subsequent proceeding to implement or enforce its terms. Solely to avoid delay, uncertainty, inconvenience, and the expense of protracted litigation, and in consideration of the mutual promises and obligations of this Consent Order, the Parties agree to the terms herein.

I. JURISDICTION

This Court has jurisdiction over the subject matter of this action and of the Parties consenting hereto pursuant to the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/1 *et seq.* (2016); the Oil Spill Responders Liability Act, 740 ILCS 113/1 *et seq.* (2016); and Illinois state common law.

II. AUTHORIZATION

The undersigned representatives for each Party certify they are fully authorized by the party whom they represent to enter the terms and conditions of this Consent Order and to legally bind the Party to it.

III. DEFINITIONS

In addition to other terms which are defined throughout the body of this Consent Order, for purposes of this Consent Order and the Appendices hereto, the following terms have the meanings indicated below:

A. "Act" means the Illinois Environmental Protection Act, 415 ILCS 5/1 *et seq.*

B. "APA" means the Asset Purchase Agreement, dated August 30, 1988, entered between Old Clark/Apex and Premcor to sell some or all of the Facility to Premcor.

C. "Bankruptcy Orders" mean collectively the orders entered in In re Apex Oil Company, 92 B.R. 847 (E.D. Mo. 1988), and In re Apex Oil Company, 118 B.R. 683 (E.D. Mo. 1990).

D. "Board" means the Illinois Pollution Control Board.

E. "Environmental Laws" means any federal, state, or local law, statute, code, ordinance, rule, regulation, or order, including common law, relating to the protection of the environment or the protection of the health and safety of humans as it relates to environmental

protection, including pursuant to 42 U.S.C. §§ 9601 *et seq.*, the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA").

F. "Facility" means the real property currently or formerly owned by Premcor and located in Hartford, Illinois, which Premcor and others previously operated as an oil refinery, and which is made up of: (1) the area from the current property boundary at the existing railroad right of way to the west, to Route 111 on the east, from the southern boundary of the current WRPL Property, to the northern boundary of the current property (the "Main Facility") (the "Main Facility" comprises those areas bounded by a dashed line as indicated on the map attached to this Consent Order as Appendix 1), and (2) the real property adjacent to the Mississippi River, a/k/a the "River Dock Area" (depicted in Appendix 1).

G. "Hartford AOC" means the Administrative Order on Consent entered in approximately March of 2004 and the addendum entered in approximately November 2005, by Premcor, Atlantic Richfield Company, ARCO Pipeline Company, Equilon Enterprises LLC d/b/a Shell Oil Products US, and BP Products North America Inc. and BP Pipelines (North America), and Sinclair Oil Corporation for remediation activities in Hartford, Illinois.

H. "Hartford UAO" means the Unilateral Administrative Order regarding the Hartford Area Hydrocarbon Site, Hartford, Illinois, dated July 20, 2010, issued by the United States Environmental Protection Agency to Premcor and other entities in Docket No. RCRA-05-2010-0020.

I. "Pipeline Defendants" means Alenco Inc., Buckeye Partners, LLC, Buckeye Pipe Line Company, Kinder Morgan Illinois Pipeline LLC, Marathon Pipe Line LLC, Platte Pipeline Company, Sinclair Oil Corporation, and Terasen Pipelines (USA) Inc., as identified in Premcor's Fourth Amended Third-Party Complaint that was filed July 31, 2013 in the above-captioned case

and is attached hereto as Exhibit A, who have not been dismissed from this lawsuit by settlement or other means prior to the date of entry of this Consent Order.

J. "Premcor" means The Premcor Refining Group Inc., d/b/a Valero Hartford Distribution Center and/or any affiliate.

K. "Premcor Parties" means Premcor, as defined in Section III.I, in addition to AOC Acquisition Corporation, Clark Oil & Refining Corporation, Clark Refining & Marketing, Inc., AOC Holdings, Inc., Clark R & M Holdings, Inc., Clark USA, Inc., Premcor USA Inc., Premcor Inc., and any and all of those Valero (as defined below) entities into which Premcor merged or became a part of on or about September 1, 2005, and all of their current parent corporations, affiliates, subsidiaries, divisions, and each of their post AOC acquisition fiduciaries, administrators, executors, directors, officers, members, employees, agents, representatives, attorneys, trustees, conservators, and consultants. With the exception of Premcor, neither "Premcor" nor "Premcor Parties" includes any party named in the State's Third Amended Complaint or Premcor's Fourth Amended Third-Party Complaint and, for the avoidance of doubt, specifically does not include Apex Oil Company, as identified in the State's Third Amended Complaint, or Shell Oil Company, as identified in Premcor's Fourth Amended Third-Party Complaint, or any other party that is not currently a direct or indirect subsidiary of Valero.

L. "Premcor Portion of the Facility" means all areas of the Facility other than the WRPL Property and WRB Property.

M. "Release" means any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.

N. "Refinery Defendants" means Apex Oil Company, Atlantic Richfield Company, ARCO Pipeline Company, BP Products North America Inc., BP Pipelines (North America) Inc.,

Koch Pipeline Company, Koch Industries Inc., and Shell Oil Products US, Equilon Enterprises, LLC., as identified in Premcor's Fourth Amended Third-Party Complaint that was filed July 31, 2013 in the above-captioned case and is attached hereto as Exhibit A.

O. "State" means the People of the State of Illinois, ex rel. Lisa Madigan, Attorney General of the State of Illinois, and Thomas D. Gibbons, Madison County State's Attorney, on behalf of the Illinois Environmental Protection Agency.

P. "Substances" means any materials or substances that may harm human health, public safety, or the environment, including but not limited to any "waste" under Section 3.535 of the Act, 415 ILCS 5/3.535 (2016), any "hazardous substance" under Section 3.215 of the Act, 415 ILCS 5/3.215 (2016), any "oil" as defined in Section 5 of the Oil Spill Responders Liability Act, 740 ILCS 113/5 (2016), any "solid waste," defined under state law, and any substance falling within the purview of 42 U.S.C. §§ 9601 *et seq* and 42 U.S.C. §§ 6901 *et seq.*

Q. "Third-Party Consultant" means consultants or service providers, including but not necessarily limited to environmental consultants and subcontractors, analytical laboratories, industrial service providers, and/or utility providers, identified by Premcor to the State as conducting Work at the Facility.

R. "Third-Party Defendants" means the parties named in Premcor's Fourth Amended Third-Party Complaint that was filed July 31, 2013 in the above-captioned case and is attached hereto as Exhibit A, who have not been dismissed from this lawsuit by settlement or other means prior to the date of entry of this Consent Order. This includes Alenco Inc., Atlantic Richfield Company, ARCO Pipeline Company, BP Products North America Inc., BP Pipelines (North America) Inc., Buckeye Partners, LLC, Buckeye Pipe Line Company, Kinder Morgan Illinois Pipeline LLC, Koch Pipeline Company, Koch Industries Inc., Marathon Pipe Line LLC, Platte

Pipeline Company, Shell Oil Products US, Equilon Enterprises, LLC, Sinclair Oil Corporation, and Terasen Pipelines (USA) Inc.

S. "Valero" means Valero Energy Corporation, a Delaware corporation and the ultimate parent company of Premcor as of the date of entry of this Consent Order.

T. "Valero Hartford Distribution Center" means the portion of the Facility that The Premcor Refining Group Inc. d/b/a Valero Hartford Distribution Center owns and operates as a petroleum distribution center, and which is made up of (a) the portion of the Main Facility which is not identified by hatching or crosshatching on the map attached hereto as Appendix 1, and (b) the River Dock Area depicted in Appendix 1.

U. "WRB Property" means the real property that Premcor previously owned and operated but on which, in approximately July 2003, Premcor sold certain refining assets and a lease of the underlying real estate associated with those assets to ConocoPhillips Company ("COP"). Premcor understands that COP transferred these assets to WRB Refining Limited Partnership and that Phillips 66 now operates the acquired refining assets for WRB.

V. "WRPL Property" means the real property that Premcor previously owned and operated but which, in approximately December 1999, Premcor sold to Equilon Enterprises LLC ("Equilon") and which Premcor understands Equilon thereafter sold to Buckeye Terminals, LLC ("Buckeye") and which Buckeye thereafter transferred to its subsidiary, Wood River Pipe Lines LLC ("WRPL"). The WRPL Property is identified by crosshatching on the map attached to this as Appendix 1.

W. "Work" means the work conducted by Premcor pursuant to this Consent Order and set forth in the Project Background Information, Technical Activities, and Conceptual Site

Model document and Strategic Plan attached hereto as Appendices 2 and 4, respectively, to this Consent Order.

IV. BACKGROUND

A. Parties

1. On November 7, 2005, an Amended Complaint for Injunctive and Other Relief was filed against Premcor, the current owner of the Premcor Portion of the Facility, on behalf of the People of the State of Illinois by Lisa Madigan, Attorney General of the State of Illinois, on her own motion, and William A. Mudge, then Madison County State's Attorney, on his own motion, and upon the request of the Illinois EPA pursuant to Sections 42(d) and (e) of the Act, 415 ILCS 5/42(d) and (e).

2. Premcor filed contribution claims pursuant to the Illinois Joint Tortfeasor Contribution Act, 740 ILCS 100/0.01 *et seq.*, against the Third-Party Defendants, alleging that to the extent Premcor was found liable for more than its proportionate share of liability at the Facility, the Third-Party Defendants were liable to Premcor for their contribution to the contamination at the Facility.

3. On May 30, 2013, the People of the State of Illinois, by Lisa Madigan, Attorney General of the State of Illinois, and Thomas T. Gibbons, current Madison County State's Attorney, filed a Third Amended Complaint ("Third Amended Complaint") against Premcor alleging violation of Illinois state laws and regulations. The Third Amended Complaint also named Apex Oil Company, Inc. ("Apex") as a Defendant. The State has not filed direct claims against the Third-Party Defendants. The Third Amended Complaint alleges, *inter alia*, that Premcor is jointly and severally liable for contamination at the Facility regardless of the origin or cause of the contamination.

4. Premcor filed a Fourth Amended Third-Party Complaint against the Third-Party Defendants on July 31, 2013, alleging to the extent Premcor was found liable for more than its proportionate share of liability at the Facility, the Third-Party Defendants were liable under the Illinois Joint Tortfeasor Contribution Act to Premcor for their contribution to the contamination at the Facility. The Fourth Amended Third-Party Complaint is attached hereto as Exhibit A.

5. Neither Apex nor any of the Third-Party Defendants are Parties to this Consent Order.

6. References in this Consent Order to "Counts" are to Counts in the State's Third Amended Complaint.

7. The Illinois EPA is an administrative agency of the State of Illinois, created pursuant to Section 4 of the Act, 415 ILCS 5/4 (2016).

8. At all times relevant to this Consent Order, Premcor was and is a Delaware corporation that is authorized to transact business in the State of Illinois.

9. Valero is a Delaware corporation and the ultimate parent company of Premcor as of the date of entry of this Consent Order.

B. **Hartford Facility**

1. In or about 1940, Koch Industries, Inc. ("Koch"), or its predecessor, constructed and opened a petroleum refinery and associated pipelines in Hartford, Madison County, Illinois within the location of what currently is the Facility.

2. Koch owned and operated that refinery from approximately 1940 to approximately 1950.

3. In or about 1950, Koch sold some or all of the refinery it owned to Atlantic Richfield Co. (formerly known as Sinclair Refining Co.), which is a predecessor to BP Products North America, Inc. Hereinafter, Atlantic Richfield Co. will be referred to as "Old Sinclair/BP".

4. Old Sinclair/BP owned and operated the petroleum refinery from approximately 1950 to approximately 1967.

5. In or about 1967, Old Sinclair/BP sold some or all of the Facility it owned to Clark Oil and Refining Corporation, a Wisconsin corporation (hereafter "Clark Wisconsin").

6. Defendant Apex is a corporation organized under the laws of the State of Missouri, which is qualified to do business in the State of Illinois. A predecessor of Apex, referred to herein as "Old Apex," acquired Clark Wisconsin through a merger transaction in 1981, and, thereafter, the name of the surviving corporation was changed to Clark Oil & Refining Corporation ("Old Clark"). Old Clark was a wholly-owned indirect subsidiary of Old Apex.

7. On December 24, 1987, Old Apex and most of its subsidiaries, including Old Clark, filed for bankruptcy protection under Chapter 11 of the United States Bankruptcy Code in the Bankruptcy Court for the Eastern District of Missouri. Hereinafter, Old Clark and Old Apex will be referred to collectively as "Old Clark/Apex."

8. In 1988, Old Clark/Apex sold some or all of the Facility to Premcor pursuant to the APA.[1] At the time of the sale, Premcor was known as AOC Acquisition Company. AOC Acquisition Company thereafter changed its name to Clark Oil & Refining Corporation, a

[1] The State and Premcor disagree in certain respects regarding the meaning and legal effect of the APA. Nothing in this Consent Order is intended to prejudice, preclude or limit the State or Premcor in any way regarding their respective positions concerning the meaning and legal effect of the APA.

Delaware corporation and different corporate entity from Old Clark and Clark Wisconsin, and then to Clark Refining and Marketing, Inc., and then to its present name.

9. Premcor refined crude oil into gasoline, diesel fuel, asphalt, and other products at the Facility from 1988 until approximately September 27, 2002, when it ceased refining operations. Premcor continues to conduct certain petroleum storage, distribution, and terminal operations at those parts of the Facility that make up the Valero Hartford Distribution Center. Additional detail regarding the use and operations of the terminal is set forth in the Project Background Information, Technical Activities, and Conceptual Site Model document, attached hereto as Appendix 2.

10. On July 31, 2003, Premcor completed a transaction with ConocoPhillips Company ("COP"). The transaction included the sale of certain of the Facility's refining assets and a lease of the underlying real estate associated with those assets. Premcor understands that COP transferred these assets to WRB Refining Limited Partnership ("WRB"), and that Phillips 66 now operates the acquired refining assets at the WRB Property.

11. In approximately December 1999, Premcor sold the WRPL Property to Equilon/Shell. Premcor understands that, thereafter, Equilon/Shell sold that property to Buckeye, and Buckeye thereafter transferred the property to its subsidiary, WRPL.

C. The 2017 Partial Consent Order and Remaining Allegations of Non-Compliance

1. Premcor and the State reached a Partial Consent Order as to Counts XI, XII, XIV and XV of the Third Amended Complaint and certain other alleged violations of the Act and Board Regulations as set forth in more detail therein. The Court entered the Partial Consent Order on October 16, 2017. A copy of the Partial Consent Order is attached hereto as Exhibit B.

2. As set forth with more particularity in Counts I-X and XIII of its Third Amended Complaint, the State alleges Premcor violated certain provisions of state law, including Illinois common law, the Act, and Board Regulations, and has incurred liability under the Oil Spill Responders Liability Act, 740 ILCS 113/1 *et seq.*:

Count I: Premcor has contributed to, allowed, and continues to allow contaminants at the Facility to remain in place and is liable for public nuisance at the Facility under Illinois common law;

Count II: Premcor has contributed to, allowed, and continues to allow contaminants at the Facility to remain in place and is liable for public nuisance pursuant to 720 ILCS 5/47-5, previously enacted as 740 ILCS 55/221;

Count III: Premcor has failed to close and/or to properly monitor hazardous waste disposal sites at the Facility in violation of Section 22.3 of the Act, 415 ILCS 5/22.3;

Count IV: Premcor is responsible for the State's response costs resulting or arising out of releases and threatened releases of hazardous wastes at the Facility, pursuant to Section 22.2(f)(1)-(2) of the Act, 415 ILCS 5/22.2(f)(1)-(2);

Count V: Premcor's disposal of wastes at the Facility has violated Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e);

Count VI: Premcor's management of hazardous wastes and, upon transfer of the Facility, failure to obtain a permit with conditions to address the released contaminants, has violated Section 21(n) of the Act, 415 ILCS 5/21(n);

Count VII: Premcor is liable for the costs incurred by the State in responding to the releases of petroleum at the Facility pursuant to Section 10(d) of the Oil Spill Responders Liability Act, 740 ILCS 113/10(d);

Count VIII: Premcor has caused or allowed contaminants to enter groundwater resulting in the presence of organic and inorganic compounds in the groundwater at the Facility in excess of applicable standards, thereby violating Section 12(a) of the Act, 415 ILCS 5/12(a), and 35 Ill. Adm. Code 620.115, 620.301, 620.405, and 620.410(a) and (b);

Count IX: Premcor has caused or allowed water pollution and/or a water pollution hazard at the Facility in violation of Sections 12(a) and (d) of the Act, 415 ILCS 5/12(a) and (d);

Count X: Premcor's management of hazardous wastes around the dissolved air flotation unit and the roll-off box storage area violated Sections 21(a), (e), and (f)(1) and (2) of the Act, 415 ILCS 5/21(a), (e) and (f)(1) and (2), and 35 Ill. Adm. Code 703.121(a), 725.131, 725.151(b), 725.212(a), and 725.274; and

Count XIII: Premcor's management of asphalt tank bottoms and other oily wastes in the asphalt storage tank area and roll off box storage areas violated Sections 21(a) and (e) of the Act, 415 ILCS 5/21(a) and (e).

3. The State further alleges Premcor is liable for any remaining remediation in the vicinity of Tank 80-11, in the vicinity of Tank T-162 and/or Tank 10-6 secondary containment, and in the vicinity of Tank 10-5.

4. The State further alleges Premcor is liable for violations of Environmental Laws documented in Violation Notices M-2001-01015 and M-2002-01056 that led to the Board RCRA

permit appeal, PCB 2004-066; Violation Notice L-2001-01421; and violation notices associated with the Board enforcement case PCB 1995-163.

5. Premcor does not admit and specifically denies any liability for the alleged violations in the State's Third Amended Complaint and the other alleged violations summarized in this Section IV.C.

D. **Investigation and Compliance Activities**

1. Pursuant to Illinois law and regulations and the negotiations that culminated in this Consent Order, Premcor has undertaken and has continued to implement, at the Illinois EPA's direction and oversight, Work at the Facility. The Parties agree that the Skinner List, attached here to as Appendix 3, constitutes the list of constituents of concern at the Facility. Certain of these actions conducted by Premcor are set forth in the Partial Consent Order, attached hereto as Exhibit B; the Strategic Plan, attached hereto as Appendix 4; and the Project Background Information, Technical Activities, and Conceptual Site Model, attached hereto as Appendix 2. All attachments are incorporated herein by reference.

2. Additionally, at the direction of the Illinois EPA and as part of the negotiations that resulted in this Consent Order, Premcor has conducted and continues to conduct certain removal response measures and took the interim steps detailed in the Project Background Information, Technical Activities, and Conceptual Site Model document, attached hereto as Appendix 2. The Work done by Premcor to date is part of an ongoing effort to characterize site risks, evaluate remedial alternatives, and select a final site remedy. The Illinois EPA finds the Work done by Premcor to date under the oversight of the Illinois EPA to be consistent with Illinois law and procedure and the National Contingency Plan, 40 C.F.R. Part 300 *et seq.*

V. NON-ADMISSION OF VIOLATIONS

A. Premcor represents that it has entered this Consent Order for the purposes of settling, resolving, and compromising disputed claims without having to incur the expense of contested litigation. Premcor contends, but the State does not concede, it has legal and factual defenses to the disputed claims it would assert if the litigation went forward without settlement. By entering this Consent Order and complying with its terms, Premcor does not admit, and specifically denies, the allegations of violations within the Third Amended Complaint and other allegations of liability summarized in Section IV.C., above. Premcor does not admit liability for the contamination at the Facility, and this Consent Order shall not be interpreted as including such admission(s). As prescribed in Section XI.I., below, the Parties agree that the State's release of the Premcor Parties under this Consent Order constitutes an "administrative or judicially approved settlement" that "resolves" Premcor's "liability to the State for some or all of a response action or for some or all of the costs of such action," as these terms are contemplated under Section 113(f)(3)(B) of CERCLA (42 U.S.C. § 9613(f)(3)(B)) and within the meaning of Section 113(f)(2) of CERCLA (42 U.S.C. § 9613(f)(2)).

B. Notwithstanding any other language in this Consent Order to the contrary, this Consent Order may be used by the State, only, against Premcor in any subsequent enforcement action or permit proceeding as proof of a past adjudication of the Act and the Board Regulations for all violations alleged in the Third Amended Complaint in this matter, for purposes of Sections 39 and 42 of the Act, 415 ILCS 5/39 and 42 (2016).

C. Except as provided in Section V.B., above, neither this Consent Order nor any payments made hereto may be used by any other party, Defendant, or Third-Party Defendant in this action, or any other action, including but not limited to all regulatory, administrative, state,

and/or federal hearings, proceedings, or lawsuits, as evidence that Premcor is liable for, or admitted any liability for, violation of Environmental Laws or any other laws, wrongdoing, and/or causing or maintaining any contamination at the Facility.

VI. APPLICABILITY

A. This Consent Order shall apply to and be binding upon Premcor and the State and, as set forth in the Corporate Guaranty, attached hereto as Appendix 5, upon Valero.

B. No change in ownership, corporate status or operator of all or any portion of the Facility shall in any way alter the responsibilities of Premcor under this Consent Order. In the event of any conveyance of title, easement or other interest in all or any portion of the Facility, Premcor shall continue to be bound by and remain liable for performance of all obligations under this Consent Order. In appropriate circumstances, however, Premcor and a current or contemplated future owner or operator of all or part of the Facility may jointly request, and the State, in its discretion, may consider, modification of this Consent Order to obligate the current or proposed purchaser or operator to carry out future requirements of this Consent Order in place of, or in addition to, Premcor.

C. In the event that the Premcor Parties propose to sell or transfer any real property or operations subject to this Consent Order, Premcor shall notify the State thirty (30) calendar days prior to the conveyance of title, ownership or other interest, including a leasehold interest in the Premcor Portion of the Facility or a portion thereof. The Premcor Parties shall make as a condition of any such sale or transfer, that the purchaser or successor provide Premcor site access and all cooperation necessary for Premcor to perform to completion any Work required by this Consent Order; however, the Premcor Parties and a proposed purchaser or operator of the facility may jointly request, and the State, in its discretion, may consider modification of this Consent

Order to obligate the proposed purchaser or operator to carry out future requirements of this Consent Order in place of, or in addition to, Premcor. This provision does not relieve Premcor from compliance with any regulatory requirement regarding notice and transfer of applicable Facility permits.

VII. OTHER LAWS, LAWSUITS AND REGULATIONS

A. Except as expressly provided herein, this Consent Order in no way affects the responsibilities of Premcor under Environmental Laws or other laws with respect to any matters not addressed in this Consent Order.

B. The Parties intend this Consent Order to settle and resolve liability for the State's allegations against Premcor, as set forth in Section XI.I., including Premcor's obligation to implement the Work pursuant to this Consent Order and the response actions outlined therein.

1. Within fifteen (15) business days of the entry of this Consent Order, Premcor shall voluntarily dismiss its Board RCRA appeal of the Illinois EPA's rejection of the closure plan modification related to Violation Notices M-2001-01015 and M-2002-01056, PCB 2004-066, the Parties to bear their own costs with respect to the litigation of that proceeding.

2. As prescribed in Section XI.I., below, the Parties agree that the State's release of the Premcor Parties under this Consent Order constitutes an "administrative or judicially approved settlement" that "resolves" Premcor's "liability to the State for some or all of a response action or for some or all of the costs of such action," as these terms are contemplated under Section 113(f)(3)(B) of CERCLA (42 U.S.C. § 9613(f)(3)(B)) and within the meaning of Section 113(f)(2) of CERCLA (42 U.S.C. § 9613(f)(2)). The Parties intend for this resolution of response action liability to create a CERCLA contribution cause of action against other potentially responsible parties for the matters covered herein.

C. The Parties further intend that this Consent Order shall in no way preclude or otherwise impair Premcor's ability to pursue CERCLA claim(s) against the Refinery Defendants pursuant to 42 U.S.C. § 9613(f)(3)(B) or other grounds, including (but not necessarily limited to) the matter styled The Premcor Refining Group Inc. v. Apex Oil Company, Inc. et. al., Case No. 3:17-cv-738 in the Southern District of Illinois. Notwithstanding the foregoing, this Section VII.C. shall not undercut, alter, abridge, affect, or otherwise impair the Parties' releases and covenants not to sue set forth in Sections XI.I. and XI.J., below.

D. Notwithstanding any other provision in this Consent Order, the Parties state this Consent Order shall not prejudice or otherwise impair Premcor's rights or potential rights in The Premcor Refining Group Inc. v. ACE Insurance Company of Illinois et al., Case No. 16-MR-78 in the Circuit Court for the Third Judicial Circuit in Madison County, Illinois; or Premcor's and/or the State's rights or potential rights in the following matters: United States of America v. Apex Oil Company, Inc., Case No. 05-CV-242-DRH, filed in the U.S. District Court for the Southern District of Illinois, which had judgment entered by the U.S. District Court on July 28, 2008 ("2008 Order and Injunction"); the Hartford UAO; the Hartford AOC; and any indemnities arising out of the APA or the Bankruptcy Orders, or any other judgment, order, or decree entered in an action to the extent said judgment, order, or decree enforces or implements relief obtained in the above listed actions.

VIII. VENUE

The Parties agree that the venue of any action in the circuit court for the purposes of interpretation and enforcement of the terms and conditions of this Consent Order shall be in the Circuit Court for the Third Judicial Circuit in Madison County, Illinois.

IX. THE PARTIES' AGREEMENTS NOTWITHSTANDING ENTRY OF THIS CONSENT ORDER

A. The Parties agree that upon the execution of this Consent Order by their respective authorized representatives, the Parties will promptly move to have the Joint Motion heard and entered by the Court. Each Party agrees that it (i) promptly will seek and diligently pursue entry of this Consent Order; and (ii) will defend this Consent Order before the Court and before any appellate court as a good faith settlement and final dismissal of the State's claims against Premcor, asserted or potential, under the Environmental Laws with respect to the Facility as provided in Section XI.I.

B. The Parties stipulate that this Consent Order constitutes a good faith settlement of the State's allegations against Premcor with respect to the Facility as detailed in Section IV.C. The State stipulates that it gives all dismissals, releases, and covenants not to sue provided in this Consent Order as to the Premcor Parties and the Pipeline Defendants, as set forth in Sections XI.I. and XI.J., respectively, in good faith and to the fullest extent possible pursuant to Section 2 of the Illinois Joint Tortfeasor Contribution Act, 740 ILCS 100/2 (2016).

C. The Parties further stipulate that this Consent Order and the dismissals, releases, and covenants not to sue provided herein were entered in good faith based upon arms-length negotiation among the Parties and their counsel.

D. Notwithstanding any other provision in this or any other Section of this Consent Order, the effectiveness of Sections XI.I. and XI.J. is expressly conditioned on a finding of good faith by this Court in the above-captioned case and the Consent Order becoming a Final Non-Appealable Dismissal Order, which terms mean either: (a) this Consent Order after its entry by the Court in Agreed Form is not appealed by any party or third party and the time for doing so has expired; or (b) this Consent Order in Agreed Form is upheld in its entirety following any and

all appeals and the time for making any further appeals has expired. "Agreed Form" means in the form jointly submitted by the Parties, or in such form as the Parties mutually may agree.

E. In the event this Consent Order is (a) not entered by the Court in Agreed Form, or (b) entered by the Court in Agreed Form but does not become a Final Non-Appealable Dismissal Order, then, unless otherwise mutually agreed by both the State and Premcor, the above-captioned case, rather than having been settled as between the State and Premcor and the claims therein released as to the State and the Premcor Parties (Section XI.I.) and the State and the Pipeline Defendants (Section XI.J.), then will proceed in the ordinary course against Premcor and the Third-Party Defendants as if this Consent Order had not been entered and the entry of the Consent Order and Work set forth herein shall be deemed settlement discussions and inadmissible for any purpose in any and all subsequent proceedings.

X. MISCELLANEOUS PROVISIONS

A. Force Majeure

1. For the purpose of this Consent Order, *force majeure* is an event arising solely beyond the control of Premcor, which prevents the timely performance of any of the requirements of this Consent Order. For purposes of this Consent Order, *force majeure* shall include, but is not limited to, events such as floods, fires, tornadoes, other natural disasters, and labor disputes beyond the reasonable control of Premcor.

2. When, in the opinion of Premcor, a *force majeure* event occurs which causes or may cause a delay in the performance of any of the requirements of this Consent Order, Premcor shall orally notify the State within seventy-two (72) hours of the occurrence. Written notice shall be given to the State as soon as practicable, but no later than ten (10) calendar days after the claimed occurrence.

3. Failure by Premcor to comply with the notice requirements of Section X.A.2. shall render this Section X.A. voidable by the State as to the specific event for which Premcor has failed to comply with the notice requirement. If voided, this Section X.A. shall be of no effect as to the particular event involved.

4. Within ten (10) calendar days of receipt of the *force majeure* notice required under Section X.A.2., the State shall respond to Premcor in writing regarding Premcor's claim of a delay or impediment to performance. If the State agrees that the delay or impediment to performance has been or will be caused by circumstances beyond the control of Premcor, including any entity controlled by Premcor, and that Premcor could not have prevented the delay by the exercise of due diligence, the Parties shall stipulate in writing to an extension of the required deadline(s) for all requirement(s) affected by the delay, by a period equivalent to the delay actually caused by such circumstances. Such stipulation may be filed as a modification to this Consent Order pursuant to the modification procedures established in this Consent Order. Premcor shall not be liable for stipulated penalties for the period of any such delay.

5. If the State does not accept Premcor's claim of a *force majeure* event, Premcor may submit the matter to this Court within twenty (20) calendar days of receipt of the State's determination for resolution to avoid payment of stipulated penalties, by filing a petition for determination of the issue. Once Premcor has submitted such a petition to the Court, the State shall have twenty (20) calendar days to file its response to said petition. The burden of proof of establishing that a *force majeure* event prevented the timely performance shall be upon Premcor. If this Court determines that the delay or impediment to performance has been or will be caused by circumstances solely beyond the control of Premcor, including any entity controlled by Premcor, and that Premcor could not have prevented the delay by the exercise of due diligence,

Premcor shall be excused as to that event (including any imposition of stipulated penalties), for all requirements affected by the delay, for a period of time equivalent to the delay or such other period as may be determined by this Court.

6. An increase in costs associated with implementing any requirement of this Consent Order shall not, by itself, excuse Premcor under the provisions of this Section X.A. from a failure to comply with such a requirement.

B. Dispute Resolution

1. The dispute resolution procedure provided by this Section X.B. shall be available to resolve all disputes between the State and Premcor arising under this Consent Order, except as otherwise provided in Section X.A., above, regarding *force majeure*, and except when Premcor has violated any payment or compliance deadline imposed by this Consent Order. If Premcor has violated any payment or compliance deadline, the State may elect to file a petition for adjudication of contempt or rule to show cause. Notwithstanding the above, disputes regarding an imminent and substantial endangerment to the public health, welfare, or the environment are not subject to the dispute resolution provisions of this Consent Order.

2. Deadlines and/or dates for compliance with any requirement, obligation, or deadline that are in dispute resolution pursuant to this Section X.B. shall be tolled during the dispute resolution process and stipulated penalties shall not be assessed or accrue, except as otherwise stated in this Section X.B.2., pending resolution of the dispute. At the conclusion of dispute resolution, the Court shall make a finding whether Premcor had a good faith basis for dispute resolution. If the Court finds Premcor did not have a good faith basis, Premcor shall pay all stipulated penalties assessed during the period of dispute resolution. If the Court concludes Premcor had a good faith basis for dispute resolution, Premcor shall have thirty (30) calendar

days, or such other reasonable time determined by the Court or mutually agreed to by the Parties in writing, to meet any such deadlines and/or dates for compliance that were the subject of dispute resolution. No stipulated penalties shall come due during this compliance period.

3. The dispute resolution procedures shall be invoked upon the giving of written notice by one of the Parties to this Consent Order to another describing the nature of the dispute and the noticing Party's position regarding such dispute. The Party receiving such notice shall acknowledge receipt of the notice within three (3) business days; thereafter the Parties shall schedule a meeting to discuss the dispute informally not later than thirty (30) calendar days from the receipt of such notice.

4. Disputes submitted to dispute resolution shall, in the first instance, be the subject of informal negotiations between the State and Premcor. Such period of informal negotiations shall be for a period of forty-five (45) calendar days from the date of the first meeting between representatives of the State and Premcor, unless their representatives agree to shorten or extend this period.

5. In the event the State and Premcor are unable to reach agreement during the informal negotiations period, either Party may file a petition with this Court seeking judicial resolution of the dispute. The other Party may respond to the petition by filing the administrative record of the dispute and any argument within twenty (20) calendar days of such filing. Notwithstanding any other provision of this Consent Order, this Court shall make its decision based on the administrative record and shall not draw any inferences or establish any presumptions adverse to any Party as a result of invocation of this Section X.B. or the Parties' inability to reach agreement with respect to the disputed issue.

6. The invocation of dispute resolution, in and of itself, shall not excuse compliance with any requirement, obligation, or deadline contained herein that is not under dispute, and stipulated penalties may be assessed for failure or noncompliance as to such matters during the period of dispute resolution.

7. As part of the resolution of any dispute, the State and Premcor, by agreement, or by order of this Court, may, in appropriate circumstances, extend or modify the schedule for completion of work under this Consent Order to account for the delay in the work that occurred as a result of dispute resolution.

C. Termination

1. Premcor may request this Consent Order terminate no sooner than six (6) months after Premcor has completed all Work required pursuant to this Consent Order, provided Premcor has no prior outstanding penalties with the State relating to the Work. Such a request may be made by delivering notice to the State in accordance with Section X.D., below, of this Consent Order. The request shall include a statement Premcor has completed all actions required by this Consent Order and a certification by a responsible corporate official of Premcor who shall state:

> I certify under penalty of law this document was prepared under my direction or supervision in accordance with a system designed to assure qualified personnel properly gather and evaluate the information submitted based on my inquiry of those persons directly responsible for gathering the information, and the information submitted in or accompanying this notification of final compliance is to the best of my knowledge true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fines and/or imprisonment for knowing violations.

2. The State shall notify Premcor of its decision on the request within ninety (90) calendar days of the State's receipt of the request. If the State agrees to terminate this Consent

Order, the State and Premcor shall jointly file a notice with the Court that the Consent Order is terminated. If the State does not agree to terminate this Consent Order, the State shall provide Premcor written notification stating the reasons why this Consent Order should not be terminated. Upon Premcor's receipt of such notification, the State or Premcor may initiate Dispute Resolution as provided in Section X.B., above. The Consent Order shall remain in effect pending resolution of any dispute by the State and Premcor or the Court concerning whether Premcor has completed its obligations under this Consent Order and is in compliance with the terms of the Consent Order.

3. Except as expressly stated herein, Sections XI.I. (The State's Covenant not to Sue and Release of Liabilities as to the Premcor Parties), XI.J. (The State's Covenant not to Sue and Release of Liabilities as to the Pipeline Defendants), XI.K. (Liabilities as to the Refinery Defendants) and XI.L. (The Premcor Parties' Covenant Not to Sue the State), below, shall survive any termination of this Consent Order pursuant to this Section X.C., in perpetuity. In addition, Section XI.H. (Record Preservation), below, shall survive any termination of this Consent Order pursuant to this Section X.C., in accordance with the terms therein. Upon material compliance with Sections XI.A. through XI.H., below, and the procedure set forth in Section X.C.1., above, this Consent Order shall terminate.

D. Correspondence, Reports, and Other Documents

Any and all correspondence and any other documents required under this Consent Order, except for payments pursuant to Sections XI.B. (Penalty), XI.C. (Stipulated Penalties, Interest and Default), XI.E. (Illinois EPA Cost Recovery), and XI.F. (Attorneys' Fees and Costs), shall be submitted as follows:

As to the State:

Permit Section manager
Bureau of Land—Division of Land Pollution Control
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Springfield, IL 62794-9276
amy.boley@illinois.gov
[one paper copy and electronic submission, plus additional paper copies upon request]

Field Operations Section—Bureau of Land
Illinois environmental Protection Agency
2009 Mall Street
Collinsville, IL 62234
[one paper copy]

Chief, Environmental Bureau
Illinois Attorney General's Office
500 South Second Street
Springfield, IL 62706
ebs@atg.state.il.us
[electronic submission]

As to Premcor:

Tim George
Vice President, Environmental Liability
The Premcor Refining Group Inc.
One Valero Way
San Antonio, Texas 87249-1112

The Premcor Refining Group Inc.
Attn: Legal
One Valero Way
San Antonio, Texas 87249-1112

Any Party may change the designees identified in this Section X.D. by notice, in writing to the other Parties.

E. **Other Provisions**

1. **Counterparts.** The Parties' signature to this Consent Order may be executed in counterparts, each of which constitutes an original and all of which constitute one and the same

document. Facsimiles and other electronic copies of signatures shall constitute acceptable, binding signatures for purposes of this Consent Order.

2. **Headings and Interchangeability**. The headings of Sections contained in this Consent Order are merely for the convenience of reference and shall not affect the interpretation of any of the provisions. Whenever the context so requires, the singular shall include the plural and vice versa. This Consent Order is deemed to have been drafted jointly by the Parties and therefore any uncertainty or ambiguity shall not be construed for or against any Party as an attribution of drafting to such Party.

3. **Entire Agreement**. This Consent Order, along with the attached exhibits and appendices, represents the entire agreement between and among the Parties with respect to the subject matter hereof. All agreements, covenants, representations and warranties, express or implied, oral or written of the Parties hereto concerning the subject matters hereof are incorporated herein and superseded thereby. All prior and contemporaneous negotiations, possible and alleged agreements, representations, covenants and warranties, between and among the Parties, concerning the subject matter hereof are merged herein. It is further understood that the Parties are not relying upon any matters outside the terms of and exhibits to this Consent Order in agreeing to this Consent Order.

4. **List of Exhibits and Appendices.** The following appendices are attached to and incorporated by reference into this Consent Order:

Appendix 1 is the map of the Facility.
Appendix 2 is the Project Background Information, Technical Activities, and Conceptual Site Model document.
Appendix 3 is the Skinner List.
Appendix 4 is the Strategic Plan, its appendices, and attached documents.
Appendix 5 is the Corporate Guaranty of Valero Energy Corporation.

Exhibit A is Premcor's Fourth Amended Third-Party Complaint.
Exhibit B is the Partial Consent Order.
Exhibit C is the Hartford Refinery Closure, Post-Closure and Corrective Action Trust Agreement ("Apex Trust").

XI. JUDGMENT AND ORDER

Pursuant to Section 2-1301(a) of the Code of Civil Procedure, 735 ILCS 5/2-1301(a), this Court may enter more than one judgment where appropriate under the circumstances. Therefore, the Parties having appeared and given due notice to Apex and the Third-Party Defendants, this Court, having jurisdiction over the Parties and subject matter, having considered the Parties' Joint Motion and the stipulated facts herein, and being advised in the premises, hereby finds that this Consent Order has been negotiated by the Parties in good faith; that implementation of this Consent Order will avoid prolonged and complicated litigation between the Parties; that this Consent Order is fair, reasonable, and in the public interest; that there is no just reason for delay in enforcement or appeal; and that the following relief is appropriate:

IT IS HEREBY ORDERED, ADJUDGED AND DECREED:

A. Future Compliance

1. Pursuant to Illinois law and regulations and the negotiations that culminated in this Consent Order, Premcor shall continue with, implement, and complete the Work, response actions and measures set forth in in the Strategic Plan, attached hereto as Appendix 4 and incorporated herein by reference, at the Illinois EPA's direction and oversight, and in compliance with all deadlines set or established under the Strategic Plan.

2. Premcor shall cease and desist from future violations of the Act and Board regulations that were the subject matter of the State's allegations of non-compliance in Section IV.C.

3. Premcor shall report hydrocarbon releases relating to Premcor's operations in excess of 10 barrels to land that it has detected and confirmed, as provided below:

a. Unless the release meets the criteria for immediate reporting under state or federal law, an initial report shall be made on the first business day following the event. Reporting shall be made to the telephone number provided within the Illinois Emergency Management Administration ("IEMA") reporting procedures and shall include the following:

i. The identity of the substance(s) involved in the release;

ii. An estimate of the quantity in barrels of the substance that was released to land;

iii. The time and duration of the release; and

iv. The area of the Premcor Portion of the Facility in which the release occurred.

b. A written follow-up report shall be submitted to IEMA within thirty (30) calendar days of the release. A copy of each follow-up report shall simultaneously be sent to the State in accordance with Section X.D. (Correspondence, Reports and Other Documents), above.

c. If the release is otherwise immediately reportable by Premcor under state or federal law, Premcor shall follow the state or federal requirements for immediate reporting and follow-up.

5. Premcor shall address and remediate any release identified pursuant to Section XI.A.3. consistent with the Strategic Plan and set forth its plan to address the release in the report sent pursuant to Section XI.A.3.b. Any dispute arising pursuant to this Section XI.A.5. shall be handled pursuant to Section X.B., Dispute Resolution.

B. **Penalty**

1. Premcor shall pay a civil penalty of Two Hundred Thousand Dollars ($200,000.00) within thirty (30) calendar days of entry of this Consent Order by the Court.

2. Payment shall be made by check or money order, payable to the Illinois EPA for deposit into the Environmental Protection Trust ("EPTF") and shall be sent by first class mail and delivered to:

Illinois Environmental Protection Agency
Fiscal Services
1021 North Grand Avenue East
Post Office Box 19276
Springfield, Illinois 62794-9276

3. The name and case number shall appear on the face of the check or money order. A copy of the check or money order and the transmittal letter shall be sent to:

Chief, Environmental Bureau
Illinois Attorney General's Office
500 South Second Street
Springfield, IL 62706

4. For purposes of payment and collection, Premcor may be reached at the following address:

Tim George
Vice President, Environmental Liability
The Premcor Refining Group Inc.
One Valero Way
San Antonio, Texas 87249-1112

5. For purposes of payment and collection, Premcor's attorney may be reached at the following address:

The Premcor Refining Group Inc.
Attn: Legal
One Valero Way
San Antonio, Texas 87249-1112

6. This penalty is for settlement purposes only, and by paying this penalty, Premcor in no way admits its liability for the allegations in the State's Third Amended Complaint or other violations summarized in Section IV.C., above.

C. **Stipulated Penalties, Interest and Default**

1. In the event Premcor fails to complete any Work by the date provided in this Consent Order or as otherwise approved by or agreed to by the State, subject to Section X.A. (Force Majeure) and Section X.B. (Dispute Resolution), absent any consent by the State foreclosing the need for the Work, Premcor shall provide notice to the State of each failure to comply with this Consent Order and shall pay, if demanded by the State and pursuant to the terms of this Section XI.C., stipulated penalties in the amount of Two Hundred and Fifty Dollars ($250.00) per day per violation for up to the first fifteen (15) days of violation, Five Hundred Dollars ($500.00) per day per violation for the next fifteen (15) days of violation, and One Thousand Dollars ($1,000.00) per day per violation thereafter until such time that compliance is achieved.

2. Solely for stipulated penalties based upon failure to submit required reports, no penalty shall be due if Premcor cures any violation within five (5) business days of its due date. If Premcor fails to cure a violation for failure to submit such required reports within the five business days provided for herein, the stipulated penalty of One Hundred Dollars ($100.00) per day shall apply for the first fifteen days, including the five-day cure period, and One Hundred Fifty Dollars ($150.00) per day thereafter.

3. The State may make a demand for stipulated penalties upon Premcor for its noncompliance with this Consent Order. However, failure by the State to make this demand shall not act as a waiver for the State to seek stipulated penalties during the pendency of this Consent

Order. All stipulated penalties shall be made payable within thirty (30) calendar days of the date Premcor received a demand for such penalties, subject to Section X.A. (Force Majeure) and Section X.B. (Dispute Resolution). Payment shall be delivered pursuant to Section XI.B.

4. Pursuant to Section 42(g) of the Act, 415 ILCS 5/42(g) (2016), and subject to Section X.A. (Force Majeure) and Section X.B. (Dispute Resolution), interest shall accrue on any penalty amount owed by Premcor not paid within the time prescribed herein. Interest on unpaid penalties shall begin to accrue from the date such are due and continue to accrue to the date full payment is received. Where partial payment is made on any penalty amount that is due, such partial payment shall be first applied to any interest on unpaid penalties then owing.

5. In the event Premcor fails to make any penalty payment required by this Consent Order on or before the date upon which the payment is due, Premcor shall be in default and the remaining unpaid balance of the penalty, plus any accrued interest, shall be due and owing immediately. In the event of default, the State shall be entitled to reasonable costs of collection, including reasonable attorney's fees. The penalties shall be enforceable by the State and shall be in addition to, and shall not preclude the use of, any other remedies or sanctions arising from Premcor's failure to comply with this Consent Order.

6. Any dispute arising pursuant to this Section XI.C. shall be handled pursuant to Section X.B., Dispute Resolution. The State, in its discretion, shall have the right to waive or reduce any stipulated penalty, including but not limited to, stipulated penalties that may accrue while the Parties are engaged in the Dispute Resolution process pursuant to Section X.B.

D. Financial Assurance

1. Premcor and Valero shall provide financial assurance for the Facility and Work conducted under this Order in accordance with the substantive requirements of 35 Ill. Adm. Code

724.201(c) and 724.240-724.251, and as set forth more specifically herein.

2. If the Hartford Refinery Closure, Post-Closure and Corrective Action Trust Agreement ("Apex Trust"), attached hereto as Exhibit C, is established, Illinois EPA shall direct that all funds in the Apex Trust, shall be paid to Premcor for the sole purpose of paying for Work at the Facility, used in conducting remediation activities, at the Facility. Illinois EPA shall direct that payment pursuant to this Section XI.D.2. take place in the first full quarter following the later of (1) the establishment of the Apex Trust and (2) this Consent Order becoming a Final Non-Appealable Order.

3. Within 30 calendar days of entry of this Consent Order, Premcor shall establish and maintain financial assurance in a form set forth and in accordance with the substantive requirements of 35 Ill. Adm. Code 724.243(a) through (e), according to the following schedule: from 2018 through 2021, in the amount of Twenty Million Dollars ($20,000,000.00); from 2022 through 2025, in the amount of Fifteen Million Dollars ($15,000,000.00); from 2026 through 2030, in the amount of Ten Million Dollars ($10,000,000.00); from 2031 until the estimated cost of the Work remaining at the Facility as determined pursuant to Section XI.D.7. is less than Five Million Dollars ($5,000,00.00), in the amount of Five Million Dollars ($5,000,000.00).

4. Valero, on behalf of Premcor, shall establish and maintain additional financial assurance as set forth in Appendix 5, attached hereto and incorporated by reference as though fully set forth herein.

5. If, at any time, an entity other than Premcor or a Third-Party Consultant, as defined herein, is required to conduct Work at the Facility and provides to the State financial assurance for the completion of such Work in a form set forth and in accordance with the substantive requirements of 35 Ill. Adm. Code 724.243(a) through (f), the Parties shall review

the amount of financial assurance provided by Premcor pursuant to Section XI.D.3., above, and shall revise the amount according to the value of the financial assurance provided by the non-Premcor entity.

6. The State acknowledges that any of the forms of financial assurance set forth in 35 Ill. Adm. Code 724.243(a) through (e) satisfy Premcor's obligations pursuant to Section XI.D.3., above. Premcor acknowledges it must continuously maintain one such form of financial assurance pursuant to and in the amount required by Section XI.D.3., above; however, Premcor, in its discretion, may determine annually, which instrument it will maintain to satisfy this requirement of the Consent Order.

7. The Parties shall review the estimated cost of the Work remaining at the Facility annually.

8. In the event that the estimated cost of the Work remaining at the Facility as determined pursuant to Section XI.D.7. exceeds Five Million Dollars ($5,000,000.00), but is less than the amount of financial assurance that Premcor would otherwise be required to maintain under Section XI.D.3., above, then Premcor may reduce the amount of financial assurance maintained pursuant to Section XI.D.3. to the amount of the estimated cost of the Work remaining at the Facility. When the estimated cost of the Work remaining at the Facility as determined pursuant to Section XI.D.7. is less than Five Million Dollars ($5,000,000.00), Premcor is no longer required to maintain financial assurance pursuant to Section XI.D.3., above, and Valero, only, shall be required to maintain financial assurance pursuant to Section XI.D.4., as set forth in the Corporate Guaranty attached hereto as Appendix 5.

E. Illinois EPA Cost Recovery

1. Premcor shall reimburse the Illinois EPA for all reasonable and necessary future costs incurred by the Illinois EPA related to Premcor's Work at the Facility, from the filing date of this Consent Order through completion of the requirements of this Consent Order, in its oversight of the Facility investigation and Work, including the ongoing removal response actions set forth herein, and its review and evaluation of documents and reports submitted to it pursuant to this Consent Order ("Future Response Costs"). Future Response Costs shall include, but are not limited to, direct program costs, allocated program costs and indirect costs. Direct costs shall include, but are not limited to, all related payroll costs for all applicable organizational units, outside contractor/consultants' fees, photographs, maps, laboratory services, and reviewing or developing plans, reports, documents or other items pursuant to this Consent Order. Allocated program costs represent program costs that are related to overall program operations, including, but not limited to: (1) fiscal services, bill preparation, and clerical duties; (2) Division of Legal Counsel program meetings and regulatory preparation and implementation; and (3) Bureau of Land, Office of Community Relations, Office of Emergency Response, Bureau of Water and Toxicity Assessment Unit staff program meetings and management oversight. Indirect costs are those costs incurred by Illinois EPA in day-to-day operations including, but not limited to, operation and maintenance of buildings, utilities and administrative costs. Costs pursuant to this Section XI.E.1. shall be capped at Sixty Thousand Dollars ($60,000.00) per calendar year for 2018 through 2021, Forty-Five Thousand Dollars ($45,000.00) per calendar year for years 2022 through 2026, Thirty Thousand Dollars ($30,000.00) per calendar year for years 2027 through 2031, and Fifteen Thousand Dollars ($15,000.00) per calendar year for 2032 until the Work is completed.

2. The Illinois EPA shall issue invoices with standard supporting documentation for Future Response Costs to Premcor, on a quarterly basis.

3. Within forty-five (45) calendar days of the receipt of each invoice, Premcor shall pay the Future Response Costs detailed therein by means of a check made payable to the Illinois Environmental Protection Agency for deposit in the Hazardous Waste Fund and delivered pursuant to Section XI.B., above.

4. To the extent Premcor believes any of the Future Response Costs claimed under Sections XI.E.1. and XI.E.2., above, are excessive or otherwise in error, Premcor shall provide a written response to the State outlining concerns with the costs at issue, and within thirty (30) calendar days, the State and Premcor will confer in an attempt to resolve any disputes regarding such disputed costs. Until such conference is conducted, the forty-five (45) day period for payment of oversight costs under Section XI.E.3., above, shall not commence. If, within fourteen (14) calendar days from the date of Premcor's written response, the State and Premcor cannot agree on a resolution of any cost dispute, the State and Premcor shall, within ten (10) business days, remit the matter to this Court for resolution under the Dispute Resolution provisions of Section X.B., above. In the event that Section X.B., above, is invoked following completion of the process herein described, the State and Premcor agree that there shall be no requirement to engage in further informal negotiations under Section X.B., above, prior to invoking the Court. Until such time as the Court resolves any dispute on costs remitted to it, the forty-five (45) day period for payment shall not apply, and no stipulated penalties shall accrue regarding the disputed costs.

5. Within thirty (30) calendar days of entry of this Consent Order by the Court, Premcor shall pay a sum of Two Hundred Thousand Dollars ($200,000.00) by means of a check

made payable to the Illinois Environmental Protection Agency for deposit in the Hazardous Waste Fund and delivered pursuant to Section XI.B., above, to reimburse Illinois EPA for all past costs incurred by Illinois EPA related to Premcor's Work at the Facility ("Past Response Costs").

F. **Attorneys' Fees and Costs**

1. Within thirty (30) calendar days of entry of this Consent Order by the Court, Premcor shall pay One Hundred Thousand Dollars ($100,000.00) to reimburse the Illinois Attorney General for attorneys' fees and costs.

2. Payment shall be made by check or money order, payable to the Illinois Attorney General for deposit into the "Attorney General State Projects and Court Ordered Distribution Fund (801 Fund)," for subsequent expenditure as authorized by the Attorney General and shall be sent, along with one (1) copy thereof, by first class mail and delivered to:

Illinois Attorney General's Office
Chief, Environmental Bureau
500 South Second Street
Springfield, Illinois 62706

3. The name and case number shall appear on the face of the check or money order.

G. **Right of Entry**

1. In addition to any other authority, the Illinois EPA, its employees and representatives, the Illinois Attorney General, her agents and representatives, upon presentation of appropriate credentials, shall have a right of entry to the Premcor Portion of the Facility at all reasonable times, for the purpose of conducting inspections as necessary and to monitor performance under this Partial Consent Order.

2. In conducting any inspection of the Premcor Portion of the Facility, the Illinois EPA, its employees and representatives, and the Illinois Attorney General, her agents and

representatives, may take any photographs or samples they deem necessary and inspect and copy any relevant document in order to conduct their inspection. All Parties with access to the Premcor Portion of the Facility under this Section XI.G. shall comply with all approved health and safety plans. Premcor shall cooperate to the fullest extent with the implementation of this Consent Order.

3. Nothing herein shall be interpreted as limiting or affecting Illinois EPA's or the Illinois Attorney General's right of entry or inspection authority under state or federal law.

H. **Record Preservation**

1. All records and documents in Illinois EPA's and Premcor's possession that relate to the history of the Facility or the environmental conditions at the Refinery or Premcor's performance of Work, as defined herein, shall be preserved for five (5) years after the termination of this Consent Order pursuant to Section X.C., above. After that five-year period has elapsed, Premcor shall notify Illinois EPA at least ninety (90) calendar days before any documents are scheduled to be destroyed. If Illinois EPA requests that the documents be saved, Premcor shall, at no cost to Illinois EPA, and subject to the attorney-client privilege, the attorney work product doctrine, and all other applicable privileges, which claims of privilege are subject to the Dispute Resolution provisions of Section X.B., above, give Illinois EPA the documents or copies of the documents. Upon providing such documents to the Illinois EPA pursuant to this Section XI.H.1., Premcor shall have no further obligation to retain such documentation.

2. Premcor may assert a claim of business confidentiality, or any other applicable exemption, covering part or all of the information submitted to Illinois EPA or the Illinois Attorney General's Office pursuant to the terms of this Consent Order under 5 ILCS 140/7(1) (2016). This claim shall be asserted in the manner described by 2 Ill. Adm. Code 1828.401 and

substantiated at the time the claim is made. Information determined to be within a statutory exemption pursuant to 5 ILCS 140/7 by the Illinois EPA will be given the protection specified in 2 Ill. Adm. Code 1828.401. If no such claim accompanies the information at the time the information is submitted to Illinois EPA or the Illinois Attorney General's Office, it may be made available to the public by the State without further notice to Premcor. Premcor shall not assert exemptions with respect to any data related to Facility conditions, sampling, or monitoring.

3. Any disclosures of data or information pursuant to this Section XI.H. shall be pursuant to the terms of 5 ILCS 140/7. In entering into this Consent Order, except as expressly stated in Section XI.H.2, Premcor waives any objections to the disclosure of any data gathered, generated, or evaluated by Illinois EPA or Premcor in the performance or oversight of the Work or any Illinois EPA-approved reports.

I. The State's Covenant Not to Sue and Release of Liabilities as to the Premcor Parties

1. In consideration of Premcor's commitment to cease and desist as contained in Section XI.A.2., above; Premcor's payment of Future Response Costs (Section XI.E.1.), Past Response Costs (Section XI.E.5.), and Attorneys' Fees and Costs (Section XI.F.); Premcor's Work, including ongoing removal response actions and other measures conducted or being conducted at the Facility under the direction of the Illinois EPA; and Premcor's requirement to complete the Work required hereunder, including to the extent such Work conducted is covered by the 2008 Order and Injunction, the State specifically resolves and covenants not to sue the Premcor Parties for, and releases and "resolves" the Premcor Parties from, any and all liability, claims, orders, damages, costs, or penalties (collectively "Liabilities"), arising under any Environmental Laws, including CERCLA, as stated in Section VII.B.2, relating to each Release

of Substances, threatened Release of Substances, and resulting conditions existing at, under, from, on or upon the Facility, including as alleged in the Third Amended Complaint and further set forth in Section IV.C., above. The following additional violations are specifically included in this release: the alleged violations associated with the Board enforcement case PCB 1995-163 and Violation Notices M-2001-01015, M2002-01056, and L-2001-01421.

2. The Parties agree that this Consent Order constitutes a judicially approved settlement pursuant to which Premcor and the Premcor Parties have, as of the day upon which the Consent Order becomes a Final Non-Appealable Order ("Effective Date"), resolved their liability to the State within the meaning of Section 113(f)(2) of CERCLA (42 U.S.C. § 9613(f)(2)).

3. Based on the finding in Section XI.I.2, the Parties stipulate that the dismissals, releases, and covenants not to sue in Section XI.I.1., as to Premcor and the Premcor Parties, are intended to and shall serve, as of the Effective Date, as protection from contribution actions or claims as provided by Section 113(f)(2) of CERCLA (42 U.S.C. § 9613(f)(2)), or as otherwise provided by law, for the Work, ongoing removal response actions and other measures, Past Response Costs, and Future Response Costs undertaken by Premcor pursuant to this Consent Order.

4. The Parties intend for this Consent Order to create and/or preserves a right of contribution against the Pipeline Defendants as provided by the Illinois Joint Tortfeasor Contribution Act. The Parties further intend that this settlement may not be used in any court or by any person who is not a party to this settlement in any way to diminish or limit Premcor's right to contribution.

5. The Parties further agree that this Consent Order constitutes a judicially approved

settlement pursuant to which Premcor and the Premcor Parties have, as of the Effective Date, resolved their liability to the State within the meaning of Section 113(f)(3)(B) of CERCLA (42 U.S.C. § 9613(f)(3)(B)).

6. The release and covenant not to sue in Section XI.I.1. shall take effect on the Effective Date. Notwithstanding any other provision of this Consent Order, the State reserves, and this Consent Order is without prejudice to, all rights of the State against the Premcor Parties with respect to all other matters, including but not limited to, the following:

(a) Liabilities arising from the past, present, or future disposal, Release or threatened Release of Substances by Premcor at any location that is outside of the Facility;

(b) liabilities for future violation of state, federal, local, and common laws and/or regulations;

(c) liabilities for natural resources damage arising out of the alleged violations;

(d) liabilities based on Premcor's failure to satisfy the requirements of this of this Consent Order; and

(e) liabilities pursuant to the Hartford AOC and/or the Hartford UAO.

J. <u>The State's Covenant Not to Sue and Release of Liabilities as to the Pipeline Defendants</u>

1. In consideration of Premcor's commitment to cease and desist as contained in Section XI.A.2., above, Premcor's ongoing response actions being conducted at the Facility as of the date of this Consent Order and Premcor's commitment to complete all the activities required hereunder, and to the fullest extent permitted and necessary in order for Premcor to state a claim for contribution pursuant to the Illinois Joint Tortfeasor Contribution Act, 740 ILCS 100/0.01 *et*

seq. (2016), the State releases the Pipeline Defendants from any Liabilities arising under any Environmental Laws, including CERCLA, relating to each Release of Substances, threatened release of Substances, and resulting conditions existing at, under, from, on or upon the Facility, such that the Pipeline Defendants' liability to the State is extinguished for purposes of Premcor's contribution claims against the Pipeline Defendants in the Fourth Amended Third-Party Complaint.

2. The release and covenants not to sue pursuant to Section XI.J.1., above, shall take effect upon the Consent Order becoming a Final Non-Appealable Order.

3. The State reserves, and this Consent Order is without prejudice to, all rights of the State of Illinois against the Pipeline Defendants with respect to all other matters not covered by this Consent Order, including, but not limited to, the following:

(a) Liabilities arising from the past, present, or future disposal, Release or threatened Release of Substances by the Third-Party Defendants at any location that is outside of the Facility;

(b) liabilities for future violation of state, federal, local, and common laws and/or regulations;

(c) liabilities for natural resources damage arising out of the alleged violations; and

(d) liabilities pursuant to the Hartford AOC and/or the Hartford UAO.

K. **Liabilities as to the Refinery Defendants**

This Consent Order is not a resolution of liability as to the Refinery Defendants under Section 113(f)(2) of CERCLA (42 U.S.C. §§ 9613(f)(2)) or Section 113(f)(3)(B) of CERCLA (42 U.S.C. §9613(f)(3)(B)), or any other Environmental Laws. Nothing in this Consent Order

constitutes a satisfaction of or release from any claim or cause of action against the Refinery Defendants for any liability such person may have under CERCLA, or any Environmental Laws, including but not limited to any claims for costs, damages, and interest under Section 107 of CERCLA (42 U.S.C. § 9607). Specifically, nothing in this Consent Order constitutes a release of liability of the Refinery Defendants or limits Premcor's rights in a CERCLA action against the Refinery Defendants, including but not necessarily limited to The Premcor Refining Group Inc. v. Apex Oil Company, Inc. et. al., Case No. 3:17-cv-738 in the Southern District of Illinois.

L. Premcor Parties' Covenant Not to Sue the State

Upon the Consent Order becoming a Final Non-Appealable Order, the Premcor Parties resolve and covenant not to sue and agree not to assert any claims or causes of action against the State, its officers, employees, agencies, departments, agents, servants, and its successors or assigns with respect to the Facility, for any actions or occurrences on or prior to the date of entry of this Consent Order. Nothing herein affects the ability of Premcor to enforce the terms of this Consent Order.

M. Retention of Jurisdiction

1. This Court shall retain jurisdiction of this matter for the purposes of interpreting and enforcing the terms and conditions of this Consent Order, except that the Parties may, by mutual written consent, modify the terms of this Consent Order without leave of court.

2. Any request for any modification of this Consent Order shall be made in writing and by separate document. Any agreed modification to this Consent Order shall be in writing, signed by authorized representatives of each Party, filed with the Court and incorporated into this Consent Order by reference.

N. **Enforcement of Consent Order**

1. This Consent Order is a binding and enforceable order of this Court and may be enforced as such through any and all available means, including but not limited to an appropriate motion filed with the Court during the duration of these proceedings. After the conclusion of these proceedings, any signatory hereto, upon motion, may reinstate these proceedings solely for the purpose of interpreting and enforcing the terms and conditions of this Consent Order.

2. Premcor agrees that notice of any subsequent proceeding to enforce this Consent Order may be made by mail and waives any requirement of service of process.

XII. GOOD FAITH FINDING AND DISMISSAL ORDER

A. The State's and Premcor's Motion for Good Faith Finding and Entry of Consent Order is hereby granted. The settlement reached between the State and Premcor is found to be a good faith settlement pursuant to the Illinois Joint Tortfeasor Contribution Act, 740 ILCS 100/1 *et seq.* (2016).

B. Based on this finding, all crossclaims, counterclaims, third-party and other claims for contribution against the Premcor Parties are hereby dismissed with prejudice and any claims for contribution that have been or could have been brought in this action against the Premcor Parties are hereby extinguished. This Consent Order specifically does not dismiss or release, and in fact, preserves, Premcor's contribution claims pursuant to the Illinois Joint Tortfeasor Contribution Act against the Pipeline Defendants, as set forth above. Further, the Parties intend that this Consent Order preserve all claims that Premcor has under CERCLA against the Refinery Defendants, as set forth above.

C. Pursuant to the terms in this Consent Order, all claims brought by the State against Premcor in the State's Third Amended Complaint are hereby dismissed with prejudice.

D. Implementation of this Consent Order will expedite and facilitate the cleanup of the Facility, will avoid prolonged and complicated litigation between the State and Premcor, is in the best interests of the Illinois public, furthers Illinois public policy, and conserves the State's financial resources.

E. This Consent Order is fair, reasonable, and in the public interest. Pursuant to Illinois Supreme Court Rule 304(a), there is no just reason for delay in enforcement or appeal of this Consent Order, including this Judgment Order.

XIII. COSTS AND FEES

Except as expressly stated herein, each Party shall bear its own costs, expert fees, attorneys' fees, and other fees incurred in connection with this action and/or in connection with this Consent Order.

[The remainder of this page is intentionally left blank.]

WHEREFORE, the Parties, by their representatives, enter into this Consent Order and submit it to this Court that it may be approved and entered.

AGREED:

FOR THE PLAINTIFFS:

PEOPLE OF THE STATE OF ILLINOIS
ex rel. LISA MADIGAN,
Attorney General of the
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

BY: Andrew Armstrong
ANDREW ARMSTRONG, Chief
Environmental Bureau

DATE: 05/18/2018

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
ALEC MESSINA, Director

BY: _____
JOHN KIM
Chief Legal Counsel

DATE: 5/16/18

BY: _____
THOMAS D. GIBBONS
Madison County State's Attorney

DATE: _____

FOR THE DEFENDANT:

THE PREMCOR REFINING GROUP INC.

BY: _____
Its _____

DATE: _____

ENTERED:

B Gordon
JUDGE

DATE: 07-26-18

(subset 1 of 3 signature pages

WHEREFORE, the Parties, by their representatives, enter into this Consent Order and submit it to this Court that it may be approved and entered.

AGREED:

FOR THE PLAINTIFFS:

PEOPLE OF THE STATE OF ILLINOIS
ex rel. LISA MADIGAN,
Attorney General of the
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

BY: _____
ANDREW ARMSTRONG, Chief
Environmental Bureau

DATE: _____

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
ALEC MESSINA, Director

BY: _____
JOHN KIM
Chief Legal Counsel

DATE: _____

BY: _____
THOMAS D. GIBBONS
Madison County State's Attorney

DATE: 5-15-2018

FOR THE DEFENDANT:

THE PREMCOR REFINING GROUP INC.

BY: _____
Its _____

DATE: _____

ENTERED:

_____
JUDGE

DATE: 07-26-18

(set 2 of 3 signature pages)

WHEREFORE, the Parties, by their representatives, enter into this Consent Order and submit it to this Court that it may be approved and entered.

AGREED:

FOR THE PLAINTIFFS:

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ex rel. LISA MADIGAN,
Attorney General of the
State of Illinois

MATTHEW J. DUNN, Chief
Environmental Enforcement/Asbestos
Litigation Division

BY: _____
ANDREW ARMSTRONG, Chief
Environmental Bureau

DATE: _____

ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY
ALEC MESSINA, Director

BY: _____
JOHN KIM
Chief Legal Counsel

DATE: _____

BY: _____
THOMAS D. GIBBONS
Madison County State's Attorney

DATE: _____

FOR THE DEFENDANT:

THE PREMCOR REFINING GROUP INC.

BY: _____
Its Senior Vice President

DATE: May 22, 2018

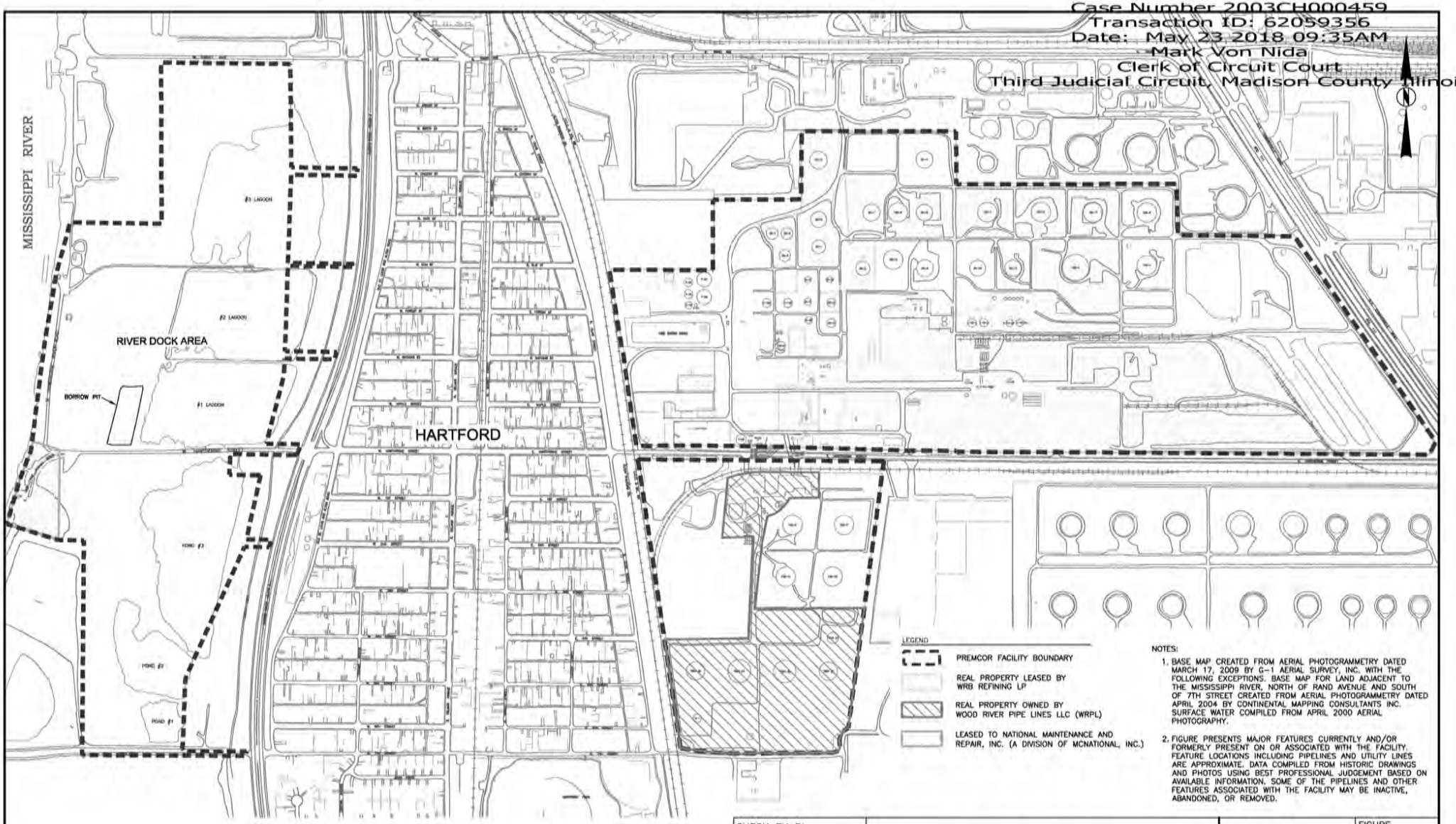
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DATE: 07-26-18

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EFILED
Case Number 2003CH000459
Transaction ID: 62059356
Date: May 23 2018 09:35AM
Mark Von Nida
Clerk of Circuit Court
Third Judicial Circuit, Madison County Illinois



APPENDIX 1

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DATE	5-9-18
SCALE	AS SHOWN
CAD NO.	0309522.201U
PRJ NO.	15-03095.21-201

PREMCOR FACILITY LAYOUT

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
1

EFILED
Case Number 2003CH000459
Transaction ID: 62059431
Date: May 23 2018 09:39AM
Mark Von Nida
Clerk of Circuit Court
Third Judicial Circuit, Madison County Illinois

Project Background Information, Technical Activities, and Conceptual Site Model at The Premcor Refining Group Inc. Hartford, Illinois Facility 1190500002 -- Madison County – ILD041889023

May 11, 2018
SMA Project No. 15-03095.25-802

Prepared for:

The Premcor Refining Group Inc.
Hartford, Illinois

Prepared By:

St. John-Mittelhauser & Associates, Inc.
1401 Branding Avenue, Suite 315
Downers Grove, Illinois 60515

APPENDIX 2

ST. JOHN · MITTELHAUSER & ASSOCIATES

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LIST OF ACRONYMS

aka	also known as
AOC	Administrative Order on Consent
Apex	Apex Oil Company, Inc.
ASTs	aboveground storage tanks
BETX	benzene, ethylbenzene, toluene, and total xylenes
bpd	barrels per day
BOD	Basis of Design
BOL	Bureau of Land
BP	British Petroleum
Buckeye	Buckeye Terminals, LLC
CAOR	Corrective Action Objective Report
CO	Consent Order
COC	Constituents of Concern
CoP	ConocoPhillips
CP	Cathodically Protected
CPT	cone penetrometer testing
CSM	Conceptual Site Model
DOT	Department of Transportation
DPE	Dual-Phase Extraction
Equilon	Equilon Enterprises LLC
FDR	Final Design Reports
GMP	Groundwater Monitoring Plan
gpm	Gallons Per Minute
GQS	Groundwater Quality Standards
HRT	Hartford River Terminal
HVR	High Vacuum Recovery
HWG	Hartford Working Group
HWRT	Hartford Wood River Terminal
IGC	Inward Gradient Control
IAGO	Illinois Attorney General's Office
Illinois EMA	Illinois Emergency Management Agency
Illinois EPA	Illinois Environmental Protection Agency
Illinois PCB	Illinois Pollution Control Board
IRMs	Interim Remedial Measures
KO	Knockout
LFDPE	Low-Flow Dual-Phase Extraction
LNAPL	Light Non-Aqueous Phase Liquid
Marathon	Marathon Pipe Line LLC
Mid America	Mid America Fuels, Inc.
MPE	Multiple-Phase Extraction
msl	mean sea level (reference is based on North American Vertical Datum of 1988)
NMR	National Maintenance and Repair, Inc.
NPB	Northern Property Boundary

LIST OF ACRONYMS
(Continued)

OER	Office of Emergency Response
PCA	Partial Closure Area
PMR	Periodic Manual Removal
Premcor	The Premcor Refining Group Inc.
Premcor Facility	Premcor's Hartford, Illinois Facility
RCRA	Resource Conservation and Recovery Act
RDPE	Refinery Dual-Phase Extraction
ROST™	Rapid Optical Screening Tool
RSVE	Refinery Soil Vapor Extraction
Shell	Shell Oil Company
Sinclair	Sinclair Oil Corporation
SMA	St. John - Mittelhauser & Associates, Inc.
south parcel	WRPL Property / Premcor South Property
SPR	Skimmer Pump Recovery
Strategic Plan	Strategic, Tactical, and Operational Plan for Site-Wide Investigation/Remediation Work attached to the Consent Order dated XXX XX, 2018
SVE	Soil Vapor Extraction
SWIGC	Site-Wide Inward Gradient Control
TACO	Tiered Approach to Cleanup Objectives
Tn	LNAPL Transmissivity
TPE	Two-Phase Extraction
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
Valero	Valero Energy Corporation
VTDC	Valero Terminaling and Distribution Company
VLS	Vapor-Liquid Separator
WPB	Western Property Boundary
WRB Refining	WRB Refining L.P.
WRPL	Wood River Pipe Lines LLC
WWTP	Waste Water Treatment Plant
WRDLD	Wood River Drainage and Levee District

1.0 INTRODUCTION

St. John – Mittelhauser & Associates, Inc. (SMA) has prepared this Project Background Information, Technical Activities, and Conceptual Site Model (CSM) (Project Background) document on behalf of The Premcor Refining Group Inc. (Premcor) for their Hartford, Illinois Facility (Premcor Facility). The purpose of this document is to provide a supplemental summary of activities at and the CSM for the Premcor Facility. This Project Background document is to be read in conjunction with the Strategic, Tactical, and Operational Plan for Site-Wide Investigation/Remediation Work (Strategic Plan) attached to the Consent Order dated XXX XX, 2018 that has been developed by Premcor, the Illinois Environmental Protection Agency (Illinois EPA) and the Illinois Attorney General's Office (IAGO). The Strategic Plan is a final remedial action plan that requires certain environmental remediation activities and is intended to incorporate, replace, or supersede all work plans and other project activities conducted at the Premcor Facility to date.

Details regarding the purpose, scope, and continued viability of project activities are contained in the Strategic Plan. Section 2.0 of this Report provides an overview of the Premcor Facility background, including the site description, surrounding land use, ownership history, historical refinery operations, and geology, hydrogeology, and hydrology. Section 3.0 presents a discussion of the key technical activities being conducted at the Premcor Facility and Section 4.0 provides the CSM for the Premcor Facility. Section 5.0 provides a brief discussion of moving forward in accordance with the Strategic Plan.

2.0 GENERAL FACILITY BACKGROUND

2.1 SITE DESCRIPTION

The Premcor Facility comprises three separate areas of land totaling approximately 400 acres. The Main Facility consists of two parcels (one north and one south of East Hawthorne Street) located on the east side of the Village of Hartford. The third parcel, referred to as the River Dock Area, is located west of the Village of Hartford between the US Army Corps of Engineers' (USACE) flood control levee and the Mississippi River. Figure 2-1 shows the locations of the Main Facility and the River Dock Area. The hydrogeology and naturally occurring subsurface features of the facility define potential groundwater flow pathways and further divide the site.

The north property of the Main Facility is approximately 205 acres and consists predominantly of aboveground storage tanks (ASTs), refinery process units and aboveground and belowground piping. WRB Refining LP (WRB Refining) (a joint venture between Phillips 66 and Cenovus Energy) owns ASTs, piping and refining process units in areas of the north parcel. Phillips 66 [a spinoff from ConocoPhillips (CoP)] is the operator for WRB Refining. The south parcel is approximately 65 acres. It is referred to herein as the Wood River Pipe Lines LLC (WRPL) Property / Premcor South Property and consists predominantly of ASTs, aboveground and belowground piping, and a truck loading rack. WRPL owns approximately half (31 acres) of this south parcel including the truck loading rack, some ASTs which are currently being operated by Marathon Pipe Line LLC (Marathon), and some of the aboveground and belowground piping. The major site features comprising the Main Facility are shown in Figure 2-2.

The River Dock Area is approximately 130 acres in size and is mostly undeveloped. The major features of the River Dock Area consist of (1) a river dock terminal for loading and unloading barges with petroleum product; (2) aboveground and underground pipelines and ASTs associated with the river dock operations; (3) a series of ponds or lagoons that were originally created by the removal of soil (clay) used for constructing the Mississippi River levee in the mid-

1950s; (4) a closed landfill formerly leased by the Village of Hartford for municipal waste and activated sludge disposal and also used by the prior Premcor Facility owners for disposal of non-combustible waste; (5) a landfill located adjacent to the River Dock Area used by the Village of Hartford for disposal of landscape waste and demolition debris; and (6) numerous underground petroleum and natural gas pipelines traversing the property which are owned by various entities. The southwest corner of this property is leased to National Maintenance & Repair, Inc. (NMR).

The River Dock was formerly connected to the Main Facility through two 10-inch and one 14-inch diameter petroleum pipelines. These pipelines run aboveground in an easterly direction from the dock to the levee and then underground to the north half of the Main Facility. The 14-inch diameter pipeline was decommissioned in 2003 with any remaining hydrocarbon products removed, the pipeline cleaned, and sections of the pipeline cut out and blinded so that the pipeline can no longer be used for its intended purpose. The two 10-inch lines were idled and the contents were displaced from the lines with nitrogen in August 2009. In the spring of 2012, a new 12-inch diameter crude pipeline was installed between the Main Facility and the River Dock through a corridor south of the Village of Hartford, and is being used to load barges. River Terminal operations restarted in the 3rd Quarter 2012 and were idled in 2016, and returned to service in February of 2018. The major site features comprising the River Dock Area are shown in Figure 2-3.

2.2 SURROUNDING LAND USE

2.2.1 Main Facility

The Main Facility is primarily bordered to the north, south and east by petroleum refining and terminal operations and to the west by the Village of Hartford. The area is served by numerous pipeline systems for delivery and distribution of hydrocarbons. In addition to the petroleum pipelines owned and/or operated by Premcor, other companies known to have either currently or previously own(ed) and/or operate(d) petroleum pipelines in the area include, but may not be

limited to the following: Alenco, British Petroleum (BP, formerly Amoco), CoP (Phillips 66), Shell Oil Company (Shell), Sinclair Oil Company (Sinclair), Apex Oil Company, Inc. (Apex), ARCO, TOSCO, Whitestar, Buckeye, Cherokee Pipeline, Explorer Pipeline, Koch Industries, Marathon Petroleum, Ozark Pipeline, Platte Pipeline Company (Platte), Enbridge, St. Louis Pipeline, Encana, Kinder Morgan, Plains All American Pipeline, and Terasen Pipelines. Some of these companies maintain pipeline right-of-ways through the River Dock area and/or Main Facility. Figure 2-4 shows the designation of pipeline corridors in the Hartford area.

Immediately north of the Main Facility, Phillips 66 operates a sulfur plant, a waste water treatment facility and ASTs for WRB Refining. Between 1920 and 1932, White Star Refining Company operated a refinery in the general area of the WRB Refining waste water treatment facility and storage tanks. It is Premcor's understanding that Shell Oil Company acquired the White Star Refinery property in 1936. It is believed that, after a series of intervening transactions, CoP became the owner of this property sometime after 2003. As of 2012, WRB Refining is the owner of this property. Further north of the WRB property, BP owns and operates a petroleum bulk storage terminal (BP Terminal) that receives and distributes refined petroleum products, Kinder Morgan operates a petroleum bulk storage terminal, and Marathon owns and operates a pipeline/distribution terminal.

Directly east of the Main Facility, Phillips 66 operates the WRB Refining petroleum refinery that was originally constructed in 1918 by Shell. The refinery receives and distributes crude oil and refined products via trucks, railcars, barges, and underground pipelines. Phillips 66 also operates ASTs directly south of East Hawthorne Street and east of the WRPL Property / Premcor South Property for WRB Refining. Platte and other companies operate pipeline terminals to the south of WRPL/Premcor South Property.

Besides the petroleum-related industry in the surrounding area, the International Shoe Company operated a tannery immediately northwest of the Main Facility. It is Premcor's understanding that the tannery began operation in approximately 1915 and that it began closing down in 1964. Shell apparently purchased the former tannery property sometime in the 1960s.

Demolition of the tannery buildings appears to have started in the late-1970s or early-1980s. All former tannery buildings were removed by the late-1980s. Portions of the property have been redeveloped to support work being conducted in the Village of Hartford by the Hartford Working Group (HWG) and to support expansion work in WRB Refining.

2.2.2 River Dock Area

The River Dock Area is bordered to the north by the WRB Refining River Front Property; to the east by properties owned by Ameren / Illinois Power Company, the Village of Hartford, and the Wood River Drainage and Levee District (WRDLD); to the south by undeveloped wooded property owned by the Village of Hartford; to the southwest by Mid America Fuels, Inc. (Mid America) and NMR; and to the west by the Mississippi River. South of the MNR property is a Marathon Pipeline Company facility. These adjacent and nearby properties are shown on Figure 2-3.

The WRB Refining River Front Property contains barge loading facilities and two lagoons (located north of Rand Avenue) believed to have been used as part of WRB Refining's wastewater treatment plant (WWTP), and previous to that, by the International Shoe Company. An industrial water supply well field, commonly called the WRB Refining "River Dock Wells," is also located on this property.

NMR, a Resource Conservation and Recovery Act (RCRA) permitted facility, operates seven dry docks and primarily repairs barges, boats and rail equipment. The NMR property formerly contained four surface impoundments, but the impoundments were closed circa 1996. Mid America operates a barge fueling operation on the northern portion of the NMR leased property. The northern portion of the NMR leased property used to be leased to the Sioux City & New Orleans Barge Line Inc. Facility drawings show that Sioux City & New Orleans Barge Line Inc. operated a barge loading dock which had an underground diesel pipeline originating from Tank 3-1 at the Premcor River Dock.

2.3 PREMCOR REFINERY OWNERSHIP HISTORY AND OPERATIONS HISTORY

2.3.1 Refinery Ownership History

The Wood River Oil and Refining Company, Inc. (predecessors of Koch Industries) completed construction of the Hartford Refinery in May 1941. In 1950, Sinclair Oil Corporation (Old Sinclair, later merged with ARCO, which was subsequently acquired by BP) acquired the Hartford Refinery. Old Sinclair operated the Facility until 1967, when Clark Oil and Refining Corporation (Old Clark, a Wisconsin corporation) purchased the Facility. That purchase excluded the bulk storage and terminal operation now owned by Hartford Wood River Terminal (HWRT) located by Old St. Louis Road and Rand Avenue in Hartford. In 1981, Apex acquired Clark Oil and Refining Corporation, and continued operating the Hartford Refinery until 1988. Apex and its subsidiaries filed for bankruptcy protection under Chapter 11 of the Internal Revenue Code in 1987. In November 1988, AOC Holdings, Inc. (AOC) [60% owned by The Horsham Corporation of Toronto, Canada] negotiated with the debtors to purchase certain assets of Apex, including the Hartford Refinery. Subsequently, AOC was renamed Clark Oil & Refining Corporation (a Delaware corporation), which became Clark Refining and Marketing, Inc. (New Clark), and subsequently, The Premcor Refining Group Inc. (Premcor) in May 2000. Valero Energy Corporation (Valero) acquired Premcor on September 1, 2005. Premcor, a wholly owned subsidiary of Valero, owns the Facility, now known as the Valero Terminaling and Distribution Company (VTDC) Hartford Distribution Terminal.

In December 1999, Premcor sold portions of the WRPL Property / Premcor South Property to Equilon Enterprises LLC (Equilon). It is Premcor's understanding that Equilon sold the property to Buckeye on October 1, 2004. Subsidiaries to Buckeye Partners, L.P., specifically, Buckeye Terminals, LLC (Buckeye) and WRPL, are believed to own portions of the WRPL Property / Premcor South Property. According to a January 27, 2010 correspondence from Buckeye Pipe Line Company to the Illinois EPA, operation of the ASTs on the WRPL property was transferred to Marathon effective February 28, 2010.

2.3.2 Refinery Operations History

Figures depicting refinery operational assets by ownership period are provided in Appendix A. When the refinery opened in 1941, its initial reported crude oil refining design capacity was 10,000 barrels per day (bpd). When Sinclair purchased the refinery in 1950, the capacity increased to 30,000 bpd. Over the succeeding years with changes in ownership and refinery expansions, maximum daily crude oil refining capacity reached approximately 70,000 bpd. Process units at the refinery included (but were not limited to) a boiler house, crude unit, delayed coker unit, fluid catalytic cracker, alkylation unit, reformer, distillate hydrodesulfurization, and total isomerization process, along with the WWTP and ASTs.

On September 28, 2002, Premcor ceased petroleum refining operations, and began de-commissioning the refining process units. Premcor continues to utilize some of the ASTs at the Main Facility to support the operation of a bulk petroleum storage and distribution center.

On July 31, 2003, Premcor completed a transaction to sell parts of the former refinery to CoP, now owned by WRB Refining and operated by Phillips 66. The transaction included the sale of certain petroleum refining assets at the property (including the Oily Water Sewer System) and a lease of the underlying real estate associated with those assets. The WRB Refining leased areas (shown as the blue-hatched area in Figure 2-2) are referred to as "Distilling West," and support their primary refining operations in their Roxana refinery located north, east, and south of the Main Facility. Phillips 66 operates the boiler house, crude unit, coker unit, and certain ASTs at the Distilling West facility for WRB Refining, and may bring additional units online in the future.

As previously mentioned, WRPL (aka Buckeye) owns and operates a petroleum terminal, pipelines, and a Truck Loading Rack on their property south of East Hawthorne Street. The Buckeye terminal is shown as a yellow-hatched area in Figure 2-2. It is understood that, during

the first quarter of 2010, Marathon took over operation of the WRPL tankage and pipelines located on the south end of the WRPL Property / Premcor South Property (i.e., Tanks 1 through 5, and Tank S-1).

Premcor utilized some of the ASTs at the Main Facility to support the operation of a bulk petroleum storage and distribution center from September 2002 until October 21, 2016. From approximately 2002 to 2011, the storage and distribution center received, stored and distributed primarily refined products. In about 2012 the storage and distribution center was converted to primarily crude service. This conversion included refurbishing several of the ASTs and building a new pipeline between the Main Facility and the River Dock. Three of the refurbished crude tanks (120-1, 120-2, and 120-3) were leased to WRB Refining in approximately 2014 with an initial 5 year lease term. In approximately October 2016 the storage and distribution center idled operations. All of the Premcor pipelines and tankage (with the exception to Tanks 10-20 and 120-10) were cleaned and de-gassed. Tanks 10-20 and 120-10 are used for the management of recovered light non-aqueous phase liquid (LNAPL) at the facility and therefore are still in operation, as is the WWTP. Premcor bulk storage and distribution operations were re-activated in early 2018.

2.4 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

The geology, hydrogeology, and hydrology of the Premcor Facility and surrounding areas are summarized in the following sections.

2.4.1 Geology

A generalized interpretation of the subsurface geology in the Hartford Area has been developed to simplify the recognition and identification of the various geologic strata. Two generalized cross sections trending west to east and two trending north to south are shown in Figures 2-5 and 2-6 respectively. The strata extents and sequences are shown in a general plan view in Figure 2-7. Detailed discussions of the subsurface geology at the Main Facility can be found in

the Group 2 Soil Investigation Report that was submitted to the Illinois EPA on October 28, 2011 and at the River Dock Area in the Group 3 Soil Investigation Report that was submitted to the Illinois EPA on September 14, 2012.

The geology of the Hartford Area consists of a thick alternating sequence of alluvial clay and silt deposits ("clay facies" of the Cahokia Formation). This sequence is underlain by regionally extensive alluvial sand ("sand facies" of the Cahokia Formation) and glacial outwash deposits (Henry Formation) consisting of sand and gravel. These massive sand and gravel deposits overlie the Glasford Till or bedrock, where the till is absent. The permeable zones within the uppermost alluvial deposits in the Hartford Area have been identified (in descending order) as the North Olive, Rand, and EPA Strata. The North Olive and Rand Strata are composed primarily of silt with lesser amounts of clay and sand. The EPA Stratum is composed primarily of sand with lesser amounts of silt and trace clay. These deposits are overlain and bounded by several less permeable alluvial deposits identified locally (in descending order) as the A Clay, B Clay, C Clay, B/C Clay (undifferentiated), and D Clay. The massive sand deposit, referred to as the Main Sand, is overlain by the alluvial clay deposits and/or a finer-grained deposit referred to as the Main Silt. The Main Silt is compositionally similar to and laterally grades into the North Olive and Rand Strata. The EPA Stratum is underlain by the D Clay and grades laterally into the Main Sand, where the D Clay is absent. The Main Sand is generally coarser grained and more extensive than the Main Silt.

The finer grained alluvial deposits in the Hartford Area generally consist of silty clay to clayey silt. The A Clay overlies the North Olive Stratum and Main Silt, where present, and forms the uppermost deposit in the Hartford Area. It also overlies the Main Sand locally within the eastern portion of the Main Facility and the River Dock Area. The B Clay and C Clay underlie the North Olive and Rand Strata, respectively. The Rand Stratum and underlying C Clay are absent in the Main Facility. In the Main Facility and portions of the Tannery Property, the B/C Clay (undifferentiated) underlies and defines the extent of the North Olive Stratum. A third less permeable alluvial deposit, referred to as the D Clay, underlies and defines the extent of the

EPA Stratum and overlies the Main Sand in the northeast portion of the Village of Hartford, and beneath the Tannery Property and the western portion of the Main Facility. This deposit generally contains more silt than the overlying clayey alluvial deposits.

A fourth less permeable alluvial layer, which is equivalent to or slightly below the D Clay stratigraphic horizon, has been identified in the WRPL Property / Premcor South Property and the Village of Hartford. This layer has been designated as the E Clay. A deposit of silty sand to sand, which is texturally finer-grained than the Main Sand, overlies this discontinuous deposit in the WRPL Property / Premcor South Property and is referred to as the South Property Sand which is considered part of the Shallow Main Sand horizon. In the Village of Hartford, the E Clay is overlain by fine to medium grained sand. The sand deposits overlying the E Clay are considered part of the upper portion of the Main Sand.

The North Olive, Rand, and EPA Strata and underlying less permeable deposits (B Clay, C Clay, B/C Clay, D Clay, and E Clay) are absent in the River Dock Area. The geologic strata encountered in this area include the A Clay, Main Silt, and Main Sand. The Main Silt overlies the Main Sand and is locally interbedded with the A Clay only along the eastern margins of the ponds and lagoons in the Premcor River Dock Area.

2.4.2 Hydrogeology

The Premcor Facility is located within the American Bottoms, which encompasses an extensive aquifer along the eastern banks of the Mississippi River. The American Bottoms Aquifer is the major source of groundwater in the region and is referred to locally as the Main Sand. It is recharged by (1) precipitation; (2) small streams and the Mississippi River; and (3) drainage along the Kendall Hills bluffs, with the majority coming from the Mississippi River.

Prior to industrialization of this area, groundwater movement in the American Bottoms Aquifer typically flowed westerly to the Mississippi River from the loess covered limestone bluffs (east hydraulic boundary of the floodplain valley) located east of the Villages of Hartford, Roxana and

Wood River, Illinois. However, the natural groundwater flow in the American Bottoms has been altered in the Hartford Area due to large-scale industrial and municipal groundwater pumping since the early 1900s. As of the date of this report, the combined water withdrawal rate in this area is approximately 14,000 gallons per minute (gpm). Industrial and municipal groundwater pumping in the area has created cones of depression in the groundwater northwest (WRB Refining River Dock facility), north (BP facility), northeast (WRB Refining facility) and west (Village of Hartford) of the Main Facility. In addition, groundwater pumping at the Main Facility is also creating cones of depression at Production Wells P-1, P-2, and/or P-5 (operated by Phillips 66 for WRB Refining) and Shallow Pumping Wells RPW-02 and RPW-03, and Production Well P-6 (operated by Premcor). In the Hartford Area, the net effect of the groundwater pumping has resulted in a northerly regional groundwater flow direction in the Main Sand; fluctuating between northwest and northeast/east during periods of low and high river stage.

Groundwater elevations within the Main Sand have fluctuated over the past several decades. Historical groundwater monitoring data indicates that the groundwater elevation was as high as 414 feet above mean sea level (msl) during 1979. However, groundwater elevations may have been higher at the time of the 1993 flood, but there is no available gauging data at the Main Facility from this time period. According to reports from the Illinois State Water Survey, groundwater elevations below the Main Facility have been as low as approximately 380 to 390 feet above msl in the mid-1950's and mid-1960. It is suspected that this period of lower groundwater elevations was attributed to the combined effects of maximum industrial groundwater use in the area in the mid-1950's and mid-1960's and a period of low precipitation as evidenced by the lowest mean Mississippi River stage in the mid-1950's.

A groundwater mound occurs within the EPA Stratum that extends from the western portion of the Main Facility northwestward through the Tannery Property and into the BP Riverfront Property. The central axis, or divide of the groundwater mound is depicted on Figure 2-8. The axis of the groundwater mound in the EPA Stratum is oriented northwest-southeast. Groundwater flows radially away from this mound. The groundwater flow direction on the east

flank of the mound is to the northeast and the flow direction on the west flank is to the southwest. This stratum is hydraulically connected to the Main Sand and groundwater beyond the edges of the D Clay flows in the direction of the prevailing hydraulic gradients in the Main Sand. A groundwater convergence zone occurs along the western extent of the D Clay where groundwater flow from the EPA Stratum and Main Sand converge. A convergence zone has also been observed along the southern and eastern margins of the D Clay.

Groundwater elevations in the EPA Stratum and Main Sand within the Main Facility fluctuate constantly in response to changes in (1) river stage; (2) pumping rates at a combination of WRB Refining Production Wells P-1, P-2, and/or P-5; and (3) barometric pressure. The largest fluctuations are attributed to changes in the Mississippi River stage.

2.4.3 Hydrology

Surface water is present within the Premcor Main Facility and River Dock Area. Surface water bodies within the Main Facility include ditches, the Guard Basin, Duck Pond, and Fire Water Pond. During periods of high precipitation surface water can also accumulate within tank berms and the North Pond. Surface water features in the River Dock Area include three lagoons, a borrow pit, three ponds, and ditches. The surface water hydrology of the Premcor Facility is presented in the following subsections.

2.4.3.1 Main Facility

The locations of the surface water features within the Main Facility, with the exception of ditches, are shown on Figure 2-2. There are no natural surface water features, although historically a shallow lake known as Grassy Lake was partly located on the eastern portion of the Main Facility prior to the 1940's and into the early 1950's.

Surface water runoff within the Main Facility is managed in accordance with the Facility's Storm Water Pollution Prevention Plan. It flows into a system of ditches, culverts, and storm water

conveyances, through a concrete oil / water separator, prior to discharging into the Guard Basin. Surface water can also be routed to the WWTP. Surface water can be routed to or pumped out of the North Pond to the Guard Basin, if needed. Storm water that accumulates within the four Premcor tank yards on the South Property (i.e, tank yards for Tanks 120-6, 120-7, 120-10, and 120-11) is pumped through an underground sewer system, underneath Hawthorne Street to the WWTP or Guard Basin. When the Duck Pond reaches its capacity, the water can be discharged into the Guard Basin via a gravity flow pipe.

When the Guard Basin reaches its operational capacity, either water can be pumped via the storm sewer to WWTP or additional storm water being routed to the Guard Basin can be temporarily diverted to either the North Pond or the Duck Pond. Treated water from the WWTP is discharged under an NPDES permit to the Mississippi River via an underground sewer located beneath Watkins Street (see Figure 2-3). A portion of the treated water is pumped to the Fire Water Pond on an as-needed basis to maintain sufficient reserve for fire-fighting purposes.

2.4.3.2 River Dock Area

Surface water features within the River Dock Area consist of six water bodies (three lagoons and three ponds), a borrow pit (when water accumulates), and associated ditches that are shown on Figure 2-3. The only natural surface water feature within the River Dock Area is the Mississippi River located along the western boundary of this parcel.

The River Dock Area is situated within the flood plain of the Mississippi River and is subject to flooding. As the river rises, it overflows its banks and can inundate the entire River Dock Area. The lagoons and ponds have no direct hydraulic connection to the Main Sand aquifer based on the available information regarding the continuity, thickness, and low permeability of the underlying A Clay. Therefore, the water levels in the lagoons and ponds are primarily controlled by the balance between precipitation and storm water runoff into the ponds, evaporation, and periodic flooding by the Mississippi River.

The six water bodies consist of three lagoons (north of Hawthorne Street) and three ponds (south of Hawthorne Street) that originated as borrow pits used for the construction of the flood control levee that borders Route 3 in the mid-1950's. A seventh borrow pit is located just west of the #1 Lagoon and periodically contains water. Historically, the three interconnected lagoons were used as settling / oxidation lagoons by previous owners of the Hartford Refinery as part of their refinery effluent treatment system circa 1956 to 1987. Refinery effluent was pumped through an underground sewer located beneath Watkins Street and discharged simultaneously to the eastern side of the #1 and #2 Lagoons, and then flowed out the west end of both lagoons to a common ditch and then through a pipe to the river. The #3 Lagoon was connected to the #2 Lagoon by a short ditch, but water in the #3 Lagoon could only discharge back into the #2 Lagoon through the same ditch. Beginning circa1968, the flow pattern was changed so that water flowed from the #1 Lagoon through an oil skimmer into the #2 Lagoon, through the #3 Lagoon, and then gravity-flowed through a series of ditches and underground pipes to the Mississippi River. A portion of these ditches have since been filled, preventing the direct discharge of water from the lagoons to the river. The three ponds have not been used for any purpose based on the available information, and there are no inlets or outlets associated with the ponds.

3.0 PROJECT TECHNICAL ACTIVITIES

A January 30, 2003 letter from the Illinois Attorney General's Office (on behalf of the Illinois EPA) required Premcor to prepare a Current Conditions Report and a Free Phase Hydrocarbon Recovery Enhancement Work Plan. The Current Conditions Report was submitted to the State on April 29, 2003 and the Free Phase Hydrocarbon Recovery Enhancement Work Plan was submitted on May 29, 2003. As Premcor proceeded with hydrocarbon investigation and interim recovery efforts, negotiations with the State on a Complaint for Injunctive and Other Relief drafted by the IAGO led to a 2007 draft CO, which was being followed by Premcor.

The 2007 draft CO proposes both Interim Remedial Measures (IRMs) and site wide investigation/remediation work at the Premcor Facility as outlined in Appendices B and C of the 2007 draft CO, respectively. Appendix A of the 2007 draft CO references the Skinner List. Appendix B IRMs work consists of groundwater inward gradient control and the enhancement of free phase hydrocarbon removal along the Western Property Boundary (WPB) of the Main Facility. Appendix C site wide investigation/remediation work includes (1) site wide inward gradient control; (2) site wide free product hydrocarbon recovery; and (3) site wide soil investigation. The following provides a brief discussion of the activities being carried out at the Premcor Facility. The key submittals associated with the work conducted pursuant to the 2007 draft CO are identified in Table 3-1.

As part of the project activities, 481 wells were installed within the Premcor Facility that are used for monitoring or remediation purposes. Table 3-2 identifies the wells and includes information such as the screened interval, stratum screened and the primary and additional uses of the well.

3.1 INTERIM REMEDIAL MEASURES

The 2007 draft CO proposed specified IRMs to be taken to address groundwater exceeding Illinois EPA approved risk-based cleanup objectives and enhance free product recovery along the Main Facility's WPB. The following sections (1) identify the Illinois EPA-approved plans and reports associated with the IRMs; and (2) describe the Systems that are operating in the WPB Area. Figures 2-2, 3-5, 3-7, and 3-8 show the locations of the IRM Systems.

3.1.1 Western Property Boundary Inward Gradient Control

Inward gradient control is ongoing and continues to limit the risk of potential migration of groundwater contamination. *The Western Property Boundary Inward Gradient Control Plan* was initially submitted on October 28, 2004. The Illinois EPA requested revisions to the Plan in a December 21, 2004 letter. Premcor submitted a revised Plan on March 4, 2005 which was approved by the Illinois EPA on April 12, 2005. Inward gradient along the WPB has been maintained according to this Plan at least since 2006. Initially, the WPB Inward Gradient Control (WPB IGC) System consisted of former facility Production Well P-6 with Shallow Pumping Well RPW-01 being installed in 2005 to enhance gradient control. As of the date of this report, it consists of Production Well P-6, and Shallow Pumping Wells RPW-02 and RPW-03.

Production Well P-6 was installed in February 1973 and operated as a groundwater production well for refinery operations until 2002 when operations ceased and then restarted in October 2004. It was a 16-inch diameter well, screened from approximately 90 to 115 feet below ground surface at the base of the Main Sand. In July 2014, its well screen was found to be compromised. A new 10-inch diameter casing and well screen were installed inside Production Well P-6 at that time.

Shallow Pumping Well RPW-01 was removed from service as an inward gradient control well in January 2013 due to the loss of well specific capacity and effectiveness. It was replaced by Shallow Pumping Wells RPW-02 and RPW-03 in March 2013. The locations of these WPB IGC System pumping wells are shown in Figure 2-2.

The WPB IGC System currently consists of Shallow Pumping Wells RPW-02 and RPW-03 and Production Well P-6. In addition, groundwater is also being recovered from Refinery Soil Vapor Extraction (RSVE) Wells screened in the North Olive and Main Silt Strata that are part of the Soil Vapor Extraction (SVE) System (operational since September 2006) and Refinery Dual-Phase Extraction (RDPE) Wells screened in the EPA Stratum and Shallow Main Sand that are part of the Low-Flow Dual-Phase Extraction (LFDPE) System (operational since December 2010). However, in December 2015 the RDPE wells were switched to vapor recovery mode only and no longer recover groundwater as of that date. Operation of these Systems is discussed in Section 3.1.2. The recovered groundwater is being processed through the Premcor WWTP. Groundwater is also being pumped by Phillips 66 from Production Wells P-1, P-2 and/or P-5 and is used by them for process water. However, a small amount of this water from Phillips 66 does enter Premcor's WWTP through boiler blow-down and other water discharges. Pumping well operation data can be found in project status reports being submitted to the Illinois EPA.

A *Response Action Plan for Groundwater Inward Gradient Control (Revision 4)* specifies when notifications to the Illinois EPA are required and what actions must be taken in the event that the pump rate decreases at the pumping wells or ceases all together. Revisions to this Plan were submitted to the Illinois EPA on July 10, 2013 and approved by the Illinois EPA in a September 24, 2013 letter.

The WPB IGC System is monitored by well gauging in accordance with the *Groundwater Monitoring Plan (Revision 3) (GMP [Rev. No. 3])* dated May 31, 2013 (approved by the Illinois EPA in a letter dated September 24, 2013), and in accordance with the Illinois EPA's letter dated June 26, 2012, requiring the quarterly gauging of monitoring wells along the WPB. Reduced

gauging along the WPB was approved in the Illinois EPA letter dated February 1, 2017. The gauging results along with groundwater sample analytical results can be found in project status reports being submitted to the Illinois EPA.

Table 3-1 lists the key documents previously submitted by Premcor associated with the WPB IGC System.

3.1.2 Enhancement of Free Phase Hydrocarbon Removal

A *Free Phase Hydrocarbon Recovery Enhancement Work Plan* was submitted on May 29, 2003, and conditionally approved by the Illinois EPA on August 5, 2003. The Work Plan focused on (1) an evaluation of the free product recovery systems that were operating in several of the wells within the Main Facility; (2) an evaluation of other potential free product recovery technologies including Dual-Phase Extraction (DPE) and interception trenches; and (3) the installation of monitoring wells to define the extent of free product. The scope was expanded to include soil borings in the WPB Area.

The information and data obtained during the implementation of the Work Plan field efforts were used in the preparation of the *Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report* submitted to the Illinois EPA on June 3, 2005. The free product recovery technologies proposed in this Basis of Design Report included SVE and pneumatic skimmer pumps (SPR System). In a letter dated September 29, 2005, the Illinois EPA approved the SVE portion of this Basis of Design Report. However, the Illinois EPA did not immediately approve the use of pneumatic skimmer pumps and requested that Premcor propose a more aggressive alternate removal technology. Premcor continues to operate the existing SPR System. The *Final Design Report – Interim Measures Western Property Boundary Free Product Enhancement Plan* for the SVE System located in the WPB Area was submitted on December 16, 2005 and approved by the Illinois EPA in a letter dated February 8, 2006. The SVE System was constructed and began operation in September 2006 and continues to conduct hydrocarbon removal.

Between November 2005 and June 2006, Premcor conducted pilot tests using various remediation techniques such as high vacuum recovery (HVR, a.k.a. two-phase extraction [TPE]) and LFDPE (a.k.a. multiple-phase extraction [MPE]) at selected monitoring wells located in the WPB Area, as well as several wells internal to the Main Facility. These tests were performed using a subcontractor's mobile unit with an internal combustion engine (Mobile ICE Unit) utilizing the LFDPE mode of operation. As a result of these tests, Premcor began focusing on the use of LFDPE as a free product recovery alternative. Additional LFDPE pilot testing was conducted between October 2006 and March 2007 using the Mobile ICE Unit. Based on the pilot testing data, an *Addendum to Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report (Basis of Design [BOD] Report Addendum),* proposing LFDPE was submitted on September 18, 2006 and conditionally approved by the Illinois EPA in a letter dated April 15, 2008. The *BOD Report Addendum* also proposed the continued use of the SPR System and Periodic Manual Removal (PMR) via vacuum truck at select wells for the removal of free product.

Premcor purchased its own Mobile ICE Unit and placed it into operation beginning in June 2007. The Unit was operated at several monitoring wells along the WPB until the fixed-based LFDPE System was installed. It was then moved to the Northern Property Boundary (NPB) Area and later expanded to wells in the central portion of the Main Facility. The *Western Property Boundary Final Design Documentation and Construction Work Plan Addendum* for the LFDPE System was submitted on June 13, 2008 and approved by the Illinois EPA in a letter dated April 13, 2009. The Illinois EPA's approval letter required installation of the LFDPE System within 120 days of receipt of necessary air and water construction permits. The LFDPE System was constructed and began operation in December 2010. The approval letter also acknowledged Premcor's SPR System and PMR of free product from certain wells using a mobile vacuum truck.

The key documents previously submitted by Premcor and associated approval dates regarding the IRMs to enhance recovery of free product are provided in the Table 3-1. The following free product recovery systems used in the WPB Area and internal to the Main Facility are discussed in the sections below:

- SVE System;
- SPR;
- PMR;
- LFDPE System; and
- Mobile ICE Unit.

The volume of LNAPL recovered from the entire Main Facility by these various technologies through 2017 was approximately 2,110,960 gallons and is summarized in Table 3-3 and Figure 3-1. The information provided on this table and figure is continually updated and provided in project status reports.

The impact of the operation of these various technologies on the removal of LNAPL can be seen in the reduction of apparent LNAPL thickness and the reduction of LNAPL transmissivity (T_n) over time. Figures 3-2 and 3-3 show the apparent LNAPL thickness measured in the WPB Area during times of confined groundwater conditions (July 2008 and April 2017, Figure 3-2) and unconfined conditions (January 2007 and April 2015, Figure 3-3). As can be seen, in July 2008 and January 2007 there was a large area along the WPB where the apparent LNAPL thicknesses were greater than five (5) feet during confined conditions and one (1) to five (5) feet in thickness during unconfined conditions. In comparison, in this same area in April 2017 (confined conditions) and April 2015 (unconfined conditions), the apparent LNAPL thicknesses at a majority of locations have been reduced to less than 0.5 feet with many locations having no measurable LNAPL. This area corresponds to the area where the LFDPE, SPR, and SVE Systems along with the Mobile ICE Unit have been in operation. Hydrocarbon recovery operations continue, and the hydraulically recoverable LNAPL in this area has been almost completely removed.

There has also been a reduction in LNAPL T_n over time as can be seen in Figure 3-4 and Table 3-4. In the WPB Area (where the LFDPE, SPR, and SVE Systems along with the Mobile ICE Unit have been in operation), T_n values dropped from greater than 5 feet square per day (ft^2/d) prior to enhanced recovery efforts to only 0.3 ft^2/d at two locations (RDPE-06CW and RPW-02), 0.2 ft^2/d at three locations (RDPE-11CW, RMP-14C, and RMW-28B), 0.1 ft^2/d or less at nine locations, and the rest (20 locations) not having enough LNAPL present to conduct an LNAPL transmissivity test. In the NPB Area (where the Mobile ICE Unit and SPR System have been in operation) LNAPL T_n has dropped from greater than 30 ft^2/d to 3.1 ft^2/d or less. Updated T_n values are provided in project status reports.

3.1.2.1 SVE System

The SVE System in the WPB Area has been in operation since September 2006. The original System includes ten (10) vapor extraction wells (RSVE-1 through RSVE-10) that are screened in the North Olive or Main Silt Strata. The SVE System was expanded in the area near Monitoring Well Nest RMW-35 as discussed in the *SVE System Effectiveness Monitoring Quarterly Report, Quarter 2, 2007.* The RMW-35 Area includes six (6) vapor extraction wells (RSVE-11 through RSVE-16) that are screened in the North Olive Stratum. The RMW-35 Area extraction wells were brought online in August 2007. Figure 3-5 is a plan view of the WPB and RMW-35 Areas showing the locations of the extraction wells, Blower Building, System Blower RB-1, Thermal Oxidizer RTO-1, the Control Building, and the Condensate Collection System. The Blower Building contains the Blower System, which is made up of a SVE vapor-liquid separator (VLS), centrifugal blower, air filter and related piping, valves, and gauges. The Condensate Collection System consists of Below Ground Condensate Tank T-101 (Tank T-101), Below Ground Condensate Tank T-102 (Tank T-102), Above Ground Tank T-171 (Tank T-171) and the piping network.

The SVE System is operated in accordance with the *Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan (Revision No. 3)* (*SVE O&M Plan [Rev. No. 3*]), dated May 13, 2010. The extraction wells, Blower System, Thermal Oxidizer RTO-1, and Condensate Collection System are monitored to evaluate the vapor flow rates, vacuum and recovery of soil vapors from the North Olive, EPA, Main Silt, and Main Sand Strata in the WPB Area, and from the North Olive Stratum in the RMW-35 Area. Thermal Oxidizer RTO-1 was designed to treat the recovered soil vapor.

The daily mass removal rate of equivalent gasoline and the calculated cumulative equivalent gasoline removed by the SVE System between October 1, 2010 and December 13, 2017 is shown in Figure 3-6. As of the end of 2017, approximately 125,710 gallons of LNAPL (gasoline equivalent) has been recovered by the SVE System (see Table 3-3). The System continues to remove LNAPL. The information provided on the above referenced figure and table is continually updated and provided in project status reports. Operational and performance monitoring data for the SVE System can also be found in project status reports being submitted to the Illinois EPA.

Because the section of the SVE System mentioned above that was expanded to the RMW-35 Area (RSVE-11 through RSVE-16) appears to have met the intended purpose of this expansion. Premcor notified the Illinois EPA on November 17, 2017 of its intent to shutdown this portion of the SVE system. In 2005, the Illinois EPA raised a concern regarding the presence of free product and benzene, ethylbenzene, toluene, and xylenes (BETX) concentrations in monitoring well RMW-35A. As a result of further investigation of the RMW-35A area, Premcor proposed (and Illinois EPA accepted) the expansion of the SVE System into this area with the addition of SVE well RSVE-11 through RSVE-16. These six extraction wells were brought online in August 2007. With the startup of this section of the SVE System, free product has not been observed in RMW-35A since August 2007 and BETX concentrations have remained below Class I Groundwater Quality Standards for 12 consecutive sampling events over a period of the last 5 years.

3.1.2.2 Skimmer Pump Recovery

Premcor operated a combination of pneumatic bladder and electric scavenger pumps in a number of monitoring wells (including RB-8, RB-10, RB-53, and RB-55) between January 1994 and December 2002. Based on a review of documents and information from that time period, over 350,000 gallons of LNAPL were recovered from these wells. In June 2003, the electric scavenger pumps were replaced with pneumatic skimmer pumps. Details of the skimmer pump upgrades are included in the August 29, 2003 *Free Phase Hydrocarbon Recovery Enhancement Evaluation*. Since then, the SPR System network has been expanded to include up to nineteen (19) locations operating at the same time during a calendar year. The locations of monitoring wells with skimmer pumps have changed within the Main Facility from time to time based on groundwater elevations and LNAPL recovery data. Figure 3-7 shows locations where skimmer pumps have been used for the recovery of LNAPL. This figure includes a table that summarizes the recovery methods utilized at wells during Q3 2017.

Between June 2003 and end of 2017, approximately 571,579 gallons of LNAPL have been recovered from wells with skimmer pumps. Summaries of the annual LNAPL removal volumes for each well are provided in Table 3-5. The information provided on this table is continually updated and provided in project status reports. Detailed information concerning SPR System operations can also be found in project status reports being submitted to the Illinois EPA.

3.1.2.3 Periodic Manual Removal

The PMR of LNAPL directly from monitoring/recovery wells utilizing a vacuum truck was initiated in 2005 for well locations (Figure 3-7) that exhibited low LNAPL recovery rates and at wells where a SPR System could not be installed due to access or infrastructure limitations. Between May 20, 2005 and the end of 2017, approximately 21,207 gallons of LNAPL have been vacuum extracted using PMR from monitoring/recovery wells located throughout the Main Facility. The annual total volumes of LNAPL removed at each well with a vacuum truck are summarized in Table 3-6.Vacuum truck removal operations are ongoing. The information

provided on this table is continually updated and provided in project status reports. Detailed information concerning PMR can also be found in project status reports being submitted to the Illinois EPA.

3.1.2.4 LFDPE System

Based on the performance of the pilot testing at the Main Facility, the LFDPE System was designed and constructed with considerable flexibility in the available modes of operation based on local geology, as well as changing groundwater, LNAPL, and/or vapor characteristics and recovery rates. The mode of operation may also be modified based on the stage and progress of remediation within the WPB Area.

Some of the possible modes of operation of the LFDPE System include:

- SVE Only;
- LNAPL Skimmer Only;
- Vacuum Enhanced Skimmer;
- Bioslurping/Enhanced Fluid Recovery (vacuum stinger only);
- Single Pump Liquid (LNAPL and groundwater recovery with submersible pump [total fluids]);
- Dual Pump Liquid (Groundwater recovery with submersible pump and LNAPL recovery with skimmer);
- LFDPE Mode 1: LNAPL and groundwater recovery with a submersible pump and stinger at top of well used for vapor recovery only;
- LFDPE Mode 2: Groundwater recovery with submersible pump, LNAPL recovery with skimmer pump and stinger used for vapor recovery only; and
- LFDPE Mode 3: LNAPL and Groundwater recovery with a submersible pump, LNAPL and vapor recovery with stinger at LNAPL surface.

The Premcor LFDPE System consists of the following:

- Fourteen 8-inch diameter RDPE Wells;
- Fourteen 2-inch diameter co-located wells (approximately 5 feet from the associated RDPE Well);
- Underground piping and interconnections for LNAPL, compressed air, vapor, groundwater, and treated water;
- Underground LFDPE VLS (also referred to as a knockout [KO] tank);
- Electrical service; and
- The LFDPE Building.

The LFDPE Building is divided into three separate rooms:

- An equipment room with fluid handling piping and vessels;
- A control room with the system electronic/electrical controllers; and
- A storage/maintenance room.

Vacuum and vapor treatment is supplied by the Premcor SVE System. Following separation of recovered LNAPL and groundwater in the KO Tank and LFDPE Building (LFDPE Groundwater Treatment System), the recovered water is pumped to the existing Premcor WWTP for further treatment. The LFDPE Building, piping and well locations are presented on Figure 3-8.

The LFDPE System construction was completed and the system was started in December 2010. Baildown tests were completed at several wells within the WPB Area in 2003 through 2010 to monitor the LNAPL T_n and establish a baseline prior to the operation of the LFDPE System. The *LFDPE Construction Completion Report* was submitted to Illinois EPA on May 26, 2011.

The LFDPE System is operated in accordance with the *Western Property Boundary Free Produce Recovery Enhancement Low-Flow Dual Phase Extraction Operation and Maintenance Plan*, (*LFDPE O&M Plan*) dated June 13, 2008. Figure 3-9 shows the vapor and liquid LNAPL recovery rates from system startup through 2017. As of the end of 2017, the LFDPE System

has recovered approximately 141,994 gallons of LNAPL. The system continues to remove LNAPL via the vapor phase under SVE mode of operation. The information provided on the above referenced figure and table is continually updated and provided in project status reports. Operational and performance monitoring data for the LFDPE System can also be found in project status reports being submitted to the Illinois EPA.

3.1.2.5 Mobile ICE Unit

Since June 2007, Premcor has operated its Mobile ICE Unit at several wells within the WPB the NPB Areas, and the central portion of the Main Facility (see Figure 3-7). Approximately 878,070 gallons of LNAPL (liquid and vapor equivalent) have been removed by the Mobile ICE Unit since start up through the end of 2017. The operational dates and volume of LNAPL recovered by the Mobile ICE Unit at monitoring wells RMW-45B, RMW-49B, RMW-72B, RMW-95, and RMW-96, (WPB Area); at monitoring wells RMW-99B, RMW-07C, and RMW-83B (NPB Area); and at monitoring wells RB-55 and RMW-60B (central portion of Main Facility) are summarized in Table 3-3. LNAPL removal operations are ongoing. The information provided on this table is continually updated and provided in project status reports.

The Mobile ICE Unit began operational testing on May 11, 2011 at monitoring well RMW-99B near the NPB. The Mobile ICE Unit has been modified to utilize the facility electrical and plant air services and SVE System vacuum since June 2012 (instead of using the internal combustion engine). The vacuum from the SVE System also provides vapor control for the Mobile ICE Unit oil/water separator. Vapor from the Mobile ICE Unit oil/water separator and recovery wells is transferred to and destroyed through the SVE System thermal oxidizer.

During Q3 2013, Premcor modified the piping associated with the Mobile ICE Unit and the SVE System to allow the connection of monitoring wells RMW-07C and RMW-83B (in addition to RMW-99B) to the Mobile ICE Unit while still having the Mobile Ice Unit located near monitoring

well RMW-99B. The connection to monitoring well RMW-07C was completed with aboveground piping, and as such, is only able to be operated when ambient temperatures are above freezing.

During Q4 2014, monitoring wells RB-55 and RMW-60B (located in the central portion of the Main Facility) were also connected to the Mobile ICE Unit. As with monitoring well RMW-07C, the connections to monitoring wells RB-55 and RMW-60B were completed with aboveground piping, and as such, were operated when ambient temperatures were above freezing and as conditions/circumstances allow. In 2015, additional valves, wireless controls, and infrastructure were installed to connect monitoring wells RB-55 and RMW-60B to the Mobile ICE Unit. During Q4 2015, electrical service was extended to the RB-55/RMW-60B area which allowed for insulation and heat trace to be installed on the piping to/from RB-55 and RMW-60B which allows for operation of these wells during freezing conditions.

Operational and performance monitoring data for the Mobile ICE Unit can be found in project status reports being submitted to the Illinois EPA.

3.2 SITE WIDE MEASURES

The following Site Wide efforts are ongoing at the Premcor Facility: (1) Site Wide Inward Gradient Control (SWIGC); (2) Site Wide Free Product Investigation; and (3) Site Wide Soil Investigation. A brief discussion of these activities is provided in the following sections.

3.2.1 Site Wide Inward Gradient Control

The *Site Wide Inward Gradient Control Work Plan* was submitted to the Illinois EPA on July 1, 2005 and conditionally approved in a letter dated December 29, 2005. The scope of work in this plan included (1) the evaluation of the horizontal and vertical extent of groundwater that requires gradient control; (2) groundwater modeling to evaluate the locations and pumping

rates for additional gradient control wells; and (3) development of a Groundwater Monitoring Program. In the December 29, 2005 approval letter, the Illinois EPA required the preparation of an Addendum Report presenting the results of the work identified in the Work Plan.

The *Addendum to Site Wide Inward Gradient Control Work Plan* was submitted to the Illinois EPA on May 5, 2006 and conditionally approved in a January 8, 2007 letter. This Work Plan included the following information: (1) the proposed locations, well construction and pumping rates for additional gradient control pumping wells; (2) the Groundwater Monitoring Program; (3) the results of the constant-rate pumping test conducted at Shallow Pumping Well RPW-01; and (4) the results of the steady-state groundwater model using Groundwater Vistas (Environmental Simulations, Inc.) and the Modular Three Dimensional Finite-Difference Groundwater Flow (MODFLOW) model developed by the United States Geological Survey (USGS).

The original *Site Wide Inward Gradient Control Basis of Design Report* submitted to the Illinois EPA on March 9, 2007 was withdrawn on May 28, 2009 due to WRB Refinery's planned expansion of their refinery production capabilities within Premcor's Main Facility. The Illinois EPA approved Premcor's request for withdrawal of the original SWIGC BOD Report in a letter dated May 28, 2009.

Premcor subsequently learned that WRB Refinery's planned expansion would require them to not only increase groundwater pumping from beneath Premcor's Main Facility, but also from their Northeast Facility and their River Dock wells. Modeling these new groundwater pumping rates from WRB Refinery, Premcor found that the original model could no longer accurately simulate the increased pumping rates and that it was necessary to build a larger, regional steady-state groundwater model. In addition, to evaluate the relation between changes in Mississippi River stage (bank storage in the aquifer) and regional groundwater flow, SMA has developed a four-layer, regional transient groundwater model. A 10-year transient model

based on ten years of actual river stage data is being updated as a means to evaluate changes in groundwater flow directions and hydraulic gradients in response to long-term changes in river stage (reflecting periods of drought and flood conditions).

In addition, there is also a need to gather additional information offsite to the north of the Tank 80-6 area and within the WRB Refinery Sulfur Plant (aka WRB West Property) and Shell Tannery Property. Premcor reached agreement with WRB Refining on extending an existing access agreement. Work within the WRB West Property has included the installation, development, and measurement of fluid levels at vapor probes and monitoring wells. Groundwater samples have also been collected, if possible, from the monitoring wells. Premcor requested access to the Shell Tannery Property to the west and northwest of the Tank 80-6 area in order to proceed with the investigation. Shell/Equilon refused to provide access. Figure 3-10 shows the monitoring probe and well locations on the WRB West Property.

Due to the need for the above mentioned information, a request was made on June 22, 2010 to suspend the deadline for submission of the SWIGC BOD Report. The Illinois EPA approved this request on August 25, 2010. One of the conditions of the approval letter was that quarterly progress reports be submitted to the Illinois EPA.

Groundwater monitoring at the Premcor Facility is conducted in accordance with the approved GMP (Rev. No. 3) as part of the *Site Wide Inward Gradient Control Plan.* In April 2015, elevated concentrations of benzene were detected in groundwater samples collected from monitoring well RMW-43A for the first time. This monitoring well is located within the WRPL property south of East Hawthorne Street. It is believed the occurrence of the benzene is attributable to petroleum releases and sources by a responsible party(ies) other than Premcor.

Premcor has had no petroleum-related operations within this area since they sold the truck loading terminal and associated tanks, and pipelines within portions of the South Property in December 1999, with the exception of a crude oil pipeline installed in 2012. This pipeline is

located to the north and west of RMW-43A and was constructed in accordance with Department of Transportation (DOT) 195 specifications[1]. Additionally, there were no reported releases within this area during Premcor's operations from 1988 to 1999.

Based on the sampling of groundwater at monitoring well RMW-43A since 2005, benzene or other petroleum constituents have not been detected at concentrations exceeding Class I Groundwater Quality Standards (GQSs) until the April 2015 sampling event. There have been two reported releases of petroleum within this area since the terminal was constructed in 1979:

- Buckeye reported release of 169 barrels (approximately 7,100 gallons) of high sulfur diesel from Tank #4 in November 2005.
- Marathon reported release of 1,441 barrels of presumed petroleum-impacted water (approximately 60,500 gallons) and 50 barrels of transmix (a mixture of gasoline and diesel - approximately 2,100 gallons) from Tank #5 in December 2013.

Further discussion of these releases is provided in Section 3-10. Given that Premcor does not own and is not in control of the WRPL Property, and has not owned or operated the terminal ASTs and pipelines in this area for over 15 years, an *Alternate Source Demonstration Report* regarding the April 2015 benzene concentrations detected at RMW-43A was submitted to the Illinois EPA on March 7, 2016. This *Alternate Source Demonstration Report* was approved by the Illinois EPA on April 30, 2018.

More information concerning SWIGC activities can be found in project status reports previously submitted to the Illinois EPA and the key documents previously submitted by Premcor listed in Table 3-1.

1 Although Premcor examined the possibility of this pipeline as a source, it was quickly ruled out due to the following: (1) the pipeline was a directional bore; (2) it was coated with "Powercrete" (an epoxy based polymer concrete) that was applied over a fusion based epoxy coating; (3) the pipeline is cathodically protected (CP) and the CP system is inspected per DOT guidelines; and (4) an inline inspection tool was run through the line in 2013.

3.2.2 Site Wide Free Product Recovery Enhancement

The primary LNAPL (free product) investigations focused on the delineation of free and or residual product using cone penetrometer testing/Rapid Optical Screening Tool (CPT/ROST™) technology at 218 locations and the installation of 353 monitoring wells to evaluate the horizontal and vertical extent of dissolved phase hydrocarbon in groundwater. Much of this work took place between 2005 and 2008, though investigation activities continue and additional work may be required in the future.

The *Site Wide Free Product Investigation Work Plan* was submitted to the Illinois EPA on April 4, 2005, and approved in a letter dated June 22, 2005. Based on the results provided in the *Site Wide Free Product Investigation Report* dated January 23, 2006, the Illinois EPA required Premcor to conduct additional investigative work, which included the installation of additional monitoring wells. The *Work Plan for Additional Site Wide Free Product Investigation* was submitted to the Illinois EPA on September 14, 2006 and approved on April 4, 2007. The purpose of the additional investigation was to evaluate the presence and refine the extent of free product, and characterize the nature, mobility, and recoverability of the LNAPL. This information, as well as the results of LNAPL distribution and recovery modeling conducted by The RETEC Group, was presented in the *Addendum to Site Wide Free Product Investigation Report* submitted to the Illinois EPA on May 28, 2009.

During a Premcor Project Status Meeting on July 22, 2009, the Illinois EPA requested additional information on the LNAPL management districts presented in the above referenced Addendum Report. In response to this request, a document discussing the establishment of six LNAPL management districts was submitted to the Illinois EPA on January 26, 2010. The location of these districts is shown on Figure 3-11 (LNAPL Management Districts 1 through 4), Figure 3-12 (LNAPL Management District 5 Main Sand below the D Clay), and Figure 3-13 (LNAPL Management District 6 Permeable Materials above EPA Stratum and Main Sand). In a June 28, 2012 letter, the Illinois EPA approved the May 2009 *Addendum to the Site Wide Free Product Investigation Report* and concluded that the LNAPL present at the facility has been adequately characterized. On October 26, 2012, the *Basis of Design Report for Site Wide*

Management of Free Product was submitted to the Illinois EPA. This document presents a conceptual plan for managing the LNAPL present at the Facility. Premcor received a letter from the Illinois EPA dated February 3, 2015 conditionally approving the October 26, 2012 *Basis of Design Report for Site Wide Management of Free Product.* Premcor sent a response letter dated March 20, 2015 stating that due to the open ended nature of Condition Number 3 of the Agency's approval letter, development of the Final Design Reports (FDR) for LNAPL Management Districts 1A and 1B as required by Condition Number 2 would not be possible. Premcor stated that in order to properly determine the applicability and potential design requirements for the hydraulic LNAPL recovery systems, there needs to be agreement on the particular lines of evidence and associated decision points regarding the demonstration that hydraulically recoverable LNAPL has been removed to the maximum extent practicable. In a letter received by Premcor from the Illinois EPA dated August 27, 2015, the Illinois EPA stated that 35 Illinois Administrative Code Part 742 (also known as Tiered Approach to Cleanup Objectives or TACO) contains no numerical standards specific to the removal of LNAPL to the maximum extent practicable. The August 27, 2015 letter also required preparation of a FDR to include this *Final Design Documentation and Construction Work Plan* and an *Operation and Maintenance Plan* for LNAPL Districts 1A and 1B at the Premcor Facility. The FDR was submitted on February 24, 2016.

More information concerning site wide free product investigation activities can be found in project status reports previously submitted to the Illinois EPA and the key documents previously submitted by Premcor listed in Table 3-1.

3.2.3 Site Wide Soil Investigation

The June 30, 2006 *Site Wide Soil Investigation Work Plan* consolidated the areas of the Premcor Facility originally described in the April 28, 2003 *Current Conditions Report* into four groups (Group 1 through Group 4) that are being investigated sequentially. This Work Plan was conditionally approved by the Illinois EPA on September 19, 2006. The soil investigation groups are shown in Figure 3-14. The result of these soil investigations led to approximately

810 soil borings being completed and 2,373 soil samples and 42 sediment samples being analyzed. The information and analytical data generated by the soil investigations, together with prior data, were used to (1) update the Conceptual Site Model; and (2) develop corrective action objectives (CAOs) for potential exposure routes during the preparation of Corrective Action Objectives Reports (CAORs) for the Partial Closure Areas (PCAs; see Section 3.2.4). In the future the data will be used to prepare CAORs for the non-PCAs in accordance with the Strategic Plan. Additionally, in their September 23, 2013 approval of the *Group 4 Soil Investigation Work Plan*, the Illinois EPA required an addendum to the June 30, 2006 Work Plan addressing the indoor air inhalation exposure route (vapor intrusion) be submitted to the Illinois EPA within 120 days of the Agency's approval of the final Group 4 Soil Investigation Report. The following briefly describes the status of work as of the date of this document associated with the site wide soil investigation. The key documents previously submitted by Premcor and associated approval dates regarding site wide soil investigation are provided in Table 3-1.

3.2.3.1 Group 1 Soil Investigation

The *Group 1 Soil Investigation Work Plan* was submitted to the Illinois EPA on January 17, 2007, and conditionally approved on July 30, 2007. Group 1 consists of four areas that border the WPB of the Main Facility:

- Area 1 - Administration Area
- Area 6 - Former Asphalt Plant
- Area 9 - Bulk Storage Tanks South
- Area 10 - Waste Water Treatment Plant Area

The field investigation in these areas was conducted between September and November 2007. A report presenting this data was submitted to the Illinois EPA on May 22, 2008. The report indicated there were data gaps, and additional investigation was conducted between October and December 2009, and in April 2010. The Group 1 investigation included the evaluation of prior soil borings and soil samples previously collected in the area along with the completion of

256 additional soil borings and collection of 563 additional soil samples. The *Group 1 Soil Investigation Addendum and Summary Report* was submitted to Illinois EPA on October 22, 2010 and approved by the Illinois EPA on February 29, 2012.

3.2.3.2 Group 2 Soil Investigation

The *Group 2 Soil Investigation Work Plan* was submitted to the Illinois EPA on June 30, 2008, and approved with conditions and modifications on October 30, 2009. Group 2 consists of two areas that border the northern and eastern property boundary of the Main Facility:

- Area 8 – Bulk Storage Tanks North
- Area 11 – Storm Water Retention

Field efforts for the Group 2 Soil Investigation began the week of November 2, 2009 but efforts were hampered by inclement weather and poor surficial conditions. The field work was completed by the end of October 2010. The Group 2 investigation included the evaluation of prior soil borings and soil samples previously collected in the area along with the completion of 280 additional soil borings and collection of 812 additional soil samples. A Preliminary Group 2 Soil Investigation Data Evaluation Memorandum was submitted to the Illinois EPA on February 28, 2011. The Illinois EPA completed their review and provided comments in an email dated July 22, 2011 requesting the Group 2 Investigation Report to be submitted by November 1, 2011. The Group 2 Soil Investigation Report was submitted to the Illinois EPA on October 28, 2011. The Illinois EPA responded on May 23, 2013 requesting additional investigation activities. The *Group 2 Supplemental Work Plan* was submitted to the Illinois EPA on August 16, 2013, with additional information submitted May 6, 2014. In a July 17, 2014 email, the Illinois EPA provided a draft approval letter of the *Group 2 Supplemental Work Plan*. On August 27, 2014, SMA provided comments and suggested changes to the draft approval letter via email. In addition, SMA prepared and included a memorandum evaluating existing soil TPH data for Group 2 sample locations in accordance with Comment 9 in the draft approval letter. In a September 10, 2014 email, Illinois EPA requested additional information regarding SMA's TPH evaluation. SMA provided this information in a September 24, 2014 email to the

Illinois EPA. The *Group 2 Supplemental Soil Investigation Work Plan* was approved by the Illinois EPA on November 7, 2014. Field Activities for the *Group 2 Supplemental Soil Investigation Work Plan* were completed by mid-December 2014 which included 14 additional soil borings and 64 additional soil samples. The *Group 2 Supplemental Soil Investigation Report* was submitted to the Illinois EPA on May 22, 2015 and conditionally approved on November 24, 2015.

3.2.3.3 Group 3 Soil Investigation

The *Group 3 Soil Investigation Work Plan* was submitted to the Illinois EPA on August 5, 2010, and approved with conditions and modifications on January 31, 2011. Group 3 (Area 2 in the Current Conditions Report) encompasses the River Dock Area. Based on an Illinois EPA email dated October 28, 2010 approving the proposed sediment sampling number and locations, field efforts for the sediment sampling portion Group 3 Soil Investigation were completed between the weeks of November 15, 2010 and December 3, 2010. Field efforts for the Group 3 soil borings began in January 2011 and were completed in March 2012. The Group 3 investigation included the evaluation of prior soil borings and soil samples previously collected in the area along with the completion of 88 additional soil borings and collection of 371 additional soil samples and 42 sediment samples. The *Group 3 Soil Investigation Report,* which recommended a groundwater investigation, was submitted to the Illinois EPA on September 14, 2012. On October 23, 2014 the Illinois EPA provided a draft approval letter regarding the *Group 3 Soil Investigation Report.* On November 3, 2014, SMA submitted an email to the Illinois EPA with questions concerning the reference to Illinois EPA's Tier 1 Screening Levels for Sediment in the draft approval letter. The Illinois EPA responded by providing additional information in an email dated December 8, 2014. Premcor responded with a letter dated March 9, 2015 stating that the impacts in Group 3 are clearly the result of other operators, and therefore, at the direction of Premcor's Legal counsel, Premcor will not perform any additional work associated with the Group 3 soil and groundwater investigation until further understanding is reached on the legal front. On June 30, 2015 an Illinois EPA letter conditionally approved the *Group 3 Soil Investigation Report* and required further soil and sediment investigation in the area and that a

Group 3 Groundwater Investigation Work Plan be submitted within 120 days. The *Group 3 Groundwater Investigation Work Plan* was submitted on October 29, 2015, and approved with conditions and modifications on August 1, 2017. The Wood River Drainage and Levee District (WRDLD) was notified in writing on September 13, 2017, of Premcor's intent to conduct further groundwater investigation including the installation of groundwater monitoring wells within the flood plain of the Mississippi River. Premcor is awaiting comment back from the WRDLD before proceeding.

3.2.3.4 Group 4 Soil Investigation

The *Group 4 Soil Investigation Work Plan* was submitted on March 20, 2013. An Illinois EPA letter dated September 23, 2013 approved this Work Plan subject to specified conditions and modifications. Group 4 consists of four areas within the process area of the Main Facility:

- Area 4 – Refinery Process I
- Area 5 – Refinery Process II
- Area 7 – Coking Unit
- Area 12 – Laydown Area

The field work for the Group 4 Soil Investigation began in October 2013 and was completed in February 2014. The Group 4 investigation included the evaluation of prior soil borings and soil samples previously collected in the area along with the completion of 174 additional soil borings and collection of 604 additional soil samples. The *Group 4 Soil Investigation Report* was submitted to the Illinois EPA on July 25, 2014. The Illinois EPA provided a draft approval letter to this report on August 6, 2015. On September 2, 2015, SMA, on behalf of Premcor, provided via email, comments and suggested changes to the draft approval letter. Also attached was a document titled *Group 4 Soil Investigation Report Errata for Table 5-5 and Appendix I.* The errata resolves the errors as identified in Comment 5 of the draft approval letter regarding the *Group 4 Soil Investigation Report.* The errata does not result in any changes to the remainder of the report, including the Summary and Conclusions. The *Group 4 Soil Investigation Report* was conditionally approved by the Illinois EPA on November 24, 2015. One of the conditions requires that a groundwater investigation be conducted within Group 4. Premcor has taken

exception to the need for additional groundwater investigation within Group 4. Previously concluded groundwater investigations and ongoing groundwater monitoring within and around the area of Group 4 adequately characterizes the groundwater in this area. Premcor replied to the Illinois EPA's approval letter on March 22, 2016 presenting its position.

3.2.4 Partial Closure Areas

During an August 17, 2017 meeting between Illinois EPA, the Illinois Attorney General Office, and Premcor, the Agency agreed that Premcor could pursue closure of portions of the Premcor Facility in advance of site wide closure. The first step in this closure process is the preparation of a CAOR. Premcor has identified three areas that are conducive to closure at this time. These areas have been named PCA Main Facility East (MFE), PCA South Property (SP), and PCA River Dock Area (RDA), and are shown in Figure 3-15.

PCA MFE is located within the Main Facility north of Hawthorne Street (Figure 3-15). It includes the entirety of Soil Investigation Area 11 and Sub-Areas 8D and 8E-2, and the majority of Areas 7 and 12. PCA SP is located within the Main Facility south of Hawthorne Street (Figure 3-15). It includes the entirety of Soil Investigation Area 6, and more than half of Area 9. PCA RDA is located west of the Village of Hartford, between the Wood River Drainage and Levee District Flood Control Levee and the Mississippi River (Figure 3-15). It includes the majority of Soil Investigation Area 2, but excludes the landfill area, the River Terminal, soil underlying the former borrow pit located west of the #1 Lagoon, and an area east of Pond #3.

Analytical data for each PCA have been evaluated and risk-based CAOs have been proposed in accordance with 35 Illinois Administrative Code 742 Tiered Approach to Corrective Action Objectives (TACO). The CAORs documenting the development of the proposed CAOs for each area have been submitted to the Illinois EPA for review and approval:

- Corrective Action Objectives Report - Partial Closure Area Main Facility East,
- Corrective Action Objectives Report - Partial Closure Area River Dock Area,
- Corrective Action Objectives Report - Partial Closure Area South Property.

3.3 TANK 80-11

Premcor also conducted an investigation and corrective action in response to a separate release of gasoline from Tank 80-11 on January 13, 2005 as part of the 2007 draft CO. Tank 80-11 is located in the eastern half of the Main Facility north of East Hawthorne Street. The Illinois EPA approved the January 27, 2006 *Tank 80-11 Soil Remediation Report* in a letter dated February 21, 2006. In addition, the March 28, 2007 *Tank 80-11 Release Area – Report of Soil Investigation Beneath Tank 80-11* was approved by the Illinois EPA in a May 22, 2007 letter requiring that any remaining contaminants must be addressed as part of the site wide investigation and remediation effort being conducted at the facility. The key documents previously submitted by Premcor and associated approval dates regarding this release are provided in Table 3-1.

3.4 TANK 10-5

On April 27, 2007, an estimated 8 barrels (336 gallons) off-spec product was inadvertently released into the tank yard for Tank 10-5 during a product transfer from Tank 10-7 to Tank 20-8. The location of Tank 10-5 is shown on Figure 2-2. An abandoned line intersected the line being used for the product transfer and this was determined to be the cause of the release in the Tank 10-5 yard. When the release was noticed, the product transfer was immediately stopped, contained within the tank yard, and was flooded with water to float the released product. The released product was then recovered using a vacuum truck. In addition, approximately 12 inches of soil (33 cubic yards) were excavated from the release area and disposed of. Soil samples were later collected from the area. The analytical results indicated that petroleum constituents were present, and accordingly, the area was being addressed as part of the site wide investigation and remediation being implemented as part of the 2007 draft CO. Details concerning the release at Tank 10-5 are provided in letters submitted to the Illinois EPA by Premcor dated May 25, 2007 and September 7, 2007 and the *Tank 10-5 Release Area Soil Sampling Report* submitted by Premcor on October 9, 2007.

3.5 TANKS T-162 and 10-6

An August 10, 2005 facility inspection by the Illinois EPA observed the alleged improper disposal of sludge next to Tank T-162 and asphalt sludge in Tank 10-6 secondary containment resulting in Violation Notice L-2005-01407. In response to this notice, Premcor submitted a work plan and implemented remediation activates in the Tank 10-6 and Tank 162 yards. Stained soil from the Tank 10-6 yard was scraped and disposed of. The soil surface surrounding Tank 162 was scraped and contaminated soil was disposed of at a landfill. As stated in a Partial CO Resolving Certain Claims Against Premcor in the case of the People of the State Illinois versus Premcor (No. 03-CH-459) filed on October 16, 2017 in the Circuit Court of the Third Judicial Circuit, Madison County, Illinois: "As a result of the remediation activities performed under the draft work plan and consistent with the resolution suggested in the Violation Notice, no additional work was performed by Premcor or requested by the State. Consistent with the correspondence between the Premcor and the State, Premcor conducted a soil investigation of these two areas. Any remaining contamination will be addressed in future remediation work at the site, which is subject of the present action that is not being resolved by this Partial Consent Order." Tank 10-6 was dismantled circa 2005. The location of Tank T-162 and former Tank 10-6 are shown in Figure 2-2.

3.6 DISSOLVED AIR FLOTATION AREA AND ROLL-OFF CONTAINER STORAGE AREA

A February 20, 2001 Illinois EPA inspection at the facility resulted in an April 18, 2001 Violation Notice (M-2001-01015) for the alleged violations in following areas: (1) the Dissolved Air Flotation (DAF) Area, located in Soil Investigation Area 10 in Group 1, and (2) the Roll-Off Container Storage Area, located in Soil Investigation Area 12 in Group 4.

Following the issuance of the VN M-2001-0105, Premcor submitted closure work plans for the two areas to Illinois EPA on June 28, 2001; Illinois EPA approved the closure work plans with conditions and modifications on October 3, 2001.

Premcor submitted a March 29, 2002 document to Illinois EPA which included a brief summary of the soil sampling results, an update of the compliance status of the violation notices with Illinois EPA, and an evaluation for the closure of the two areas by Premcor. In this submittal, Premcor stated that Post Closure Care Plans may be necessary for the two areas and that Premcor intended to obtain alternative requirements for post-closure care for these two units. In Illinois EPA's June 3, 2002 letter in response to the submittal, it was stated that the facility failed to complete closure of the two units and that insufficient information was submitted regarding the proposed course of the action.

Premcor submitted a closure report for the two units, entitled "RCRA Closure Evaluation and Sampling Report" dated May 30, 2003. This report summarized the closure activities conducted thus far for the two units including the results of additional investigation efforts conducted after their March 2002 submittal. In response, Illinois EPA issued a letter dated September 10, 2003 (Log No. C-830-M-2, C-381-M-2), disapproving the May 30, 2003 submittal for several deficiencies. Premcor appealed this decision to the Illinois Pollution Control Board (PCB) on January 13, 2004 (Dock No. 2004-66).

Between 2007 and 2013, both the DAF and the Roll-Off Container Storage Area have been investigated on a site-wide basis under the Site-Wide Soil Investigation as discussed in Sections 3.2.3, 3.2.3.1 and 3.2.3.4. Premcor will continue to address these two areas in accordance with the Strategic Plan.

3.7 HISTORICAL RELEASES

In June 1995, the State filed a complaint (Illinois Pollution Control Board [Illinois PCB] Case Number 1995-163) against Clark Refining and Marketing, Inc. (Premcor) concerning, among other things, releases (spills) that had occurred at their Hartford, IL facility in early 1990's. Premcor initiated an evaluation of these releases at the Main Facility and in the area of the Hartford River Terminal (HRT). The results of this evaluation are documented in a November 1995 report (*Summary Report of Spills at the Clark Hartford Refinery*) prepared by Burns & McDonnell Waste Consultants, Inc. As a result of this evaluation, surface and subsurface

investigations were conducted by Burns & McDonnell in areas of the releases as documented in their September 1996 report (*Summary Report: Surface and Subsurface Investigations of Spills at the Clark Harford Refinery*). The information gathered from the evaluation and investigations is included in the April 28, 2003, *Current Conditions Report.* Burns & McDonnell identified the release areas as Areas A – M which were made part of a Partial Stipulation and Settlement Agreement filed with the Pollution Control Board on November 22, 1996.

It is Premcor's understanding that the State has questions concerning the resolution of Areas A, C, D, E, H, and J. The location of these areas are shown in figures provided in Appendix B and are generally identified as follows:

Area A – asphalt (black oil) in an area located in the ditch between Premcor's west property line and the railroad tracks.

Area C – within the Tank 55-1 yard.

Area D – within the Tank 10-5 yard.

Area E – within the Tank 120-2 yard.

Area H – ditches along East Hawthorne Avenue where piping goes under the road.

Area J – at Route 3 and Elm Street on east and west side of the levee.

Concerning Areas A, E, and H, on November 3, 1997, Burns and McDonnell submitted a Tiered Approach to Cleanup Objectives (TACO) assessment to the Illinois EPA, Office of Chemical Safety (see the April 28, 2003 Current Conditions Report, Appendix P-5). This assessment concluded that these areas were all below TACO Tier 2 cleanup objectives and therefore required no further assessment or remediation. Furthermore, it is noted that Area A is located west of Premcor's western property boundary. As indicated in Condition 3 of the Illinois EPA's July 30, 2007, letter approving the Group 1 Soil Investigation Work Plan, the area west of the Premcor property is being addressed as part of United States Environmental Protection Agency's (USEPA) order on consent in the matter of The Hartford Area Hydrocarbon Plume Site. Therefore, it is not necessary for Premcor to conduct any soil investigation effort west of their property.

Concerning Areas C, D, and J, on November 20, 1997, Burns and McDonnell presented their proposed remedial approaches for Areas C, D, and J to the Illinois EPA, Office of Chemical Safety (see the April 28, 2003 Current Conditions Report, Appendix P-5).

- Area C proposed no additional remediation activities as the depth of the impacted soil indicates historical impacts not related to the spill event of interest here.
- Area D proposed no additional remediation activities as the depth of the impacted soil indicates historical impacts not related to the spill event of interest here.
- Area J proposed no additional remediation activities as this area is along the Route 3 levee and is under the jurisdiction of both the Wood River Levee District and Army Corps of Engineers. Access to this area is limited by both bureaucratic and physical obstacles and the impacted constituents of concern are limited to subsurface soil.

It should be further noted that Areas C, D, E, H, and J were included in the site wide soil investigations conducted in accordance with the 2007 draft CO and will be included in the corrective action evaluation in accordance with the Strategic Plan.

To address the historical releases in the area of the HRT (Area L , see Appendix B-5 for location), Premcor (initially by Burns and McDonnell on behalf of Premcor) has been conducting remedial activities in this area since August 1994. These activities were being overseen by the Illinois EPA's Office of Emergency Response (OER) and included excavation of impacted soil and the subsequent installation of eight wells (MW-1 through MW-4 and MW-1D through MW-4D) to monitor groundwater conditions. In 1997, to enhance groundwater remediation, a biosparging system was installed in four of the existing wells (MW-1D through MW-4D), which were renamed to SW-1 through SW-4 (see Figure 3-16). The system was shut down in November 2001 in accordance with a letter of understanding between the Illinois EPA and Premcor dated November 28, 2001. The biosparging system was subsequently dismantled and is no longer present. Monitoring wells MW-1 through MW-4 remain. Groundwater gauging data is collected from all four (4) monitoring wells and groundwater analytical data is collected from well MW-1 and MW-4 on a semi-annual basis at this time.

On January 18, 2011, Premcor submitted a request to transfer oversight of the ongoing remedial activities at the HRT from the Illinois EPA's OER to the Illinois EPA's Bureau of Land (BOL) as part of the 2007 draft CO. Subsequent telephone conversations with Mr. Yeric Yarrington of the OER, Mr. John Waligore of the Illinois EPA Division of Legal Counsel, and Ms. Paula Stine of the BOL indicated that this request was acceptable to the Illinois EPA and that the formal transfer was being worked out in consultation with Mr. James Morgan then of the IAGO. On June 23, 2011, this request was discussed between Mr. Morgan and Mr. Steve Mulkey of Premcor. Based on this discussion and understanding of Mr. Morgan's agreement to the transfer, the monitoring of these four (4) wells was integrated into the site wide groundwater monitoring and reporting, Groundwater monitoring and reporting will be in accordance with the Strategic Plan.

3.8 ABANDONED PIPING REMOVAL PROJECT

Premcor, beginning in June 2011, conducted a project to remove piping abandoned by previous owners that was considered to be a potential source of contamination found in the area. Figure 3-17 shows the locations of the removed abandoned piping. This work was carried out in a series of projects at various tank yards and at other locations within the Main Facility. Several of the lines removed contained hydrocarbons. Removal of asbestos containing insulation from piping was included as required.

In December 2012 during removal of buried and partially buried product lines abandoned by previous owners and operators in the tank yards, numerous lines were found that had been abandoned containing substantial amounts of hydrocarbon. Based on that discovery, facility drawings from the 1940's through the 1960's were reviewed to identify additional buried lines. After an exploratory investigation, product lines abandoned by previous owners and operations were excavated and removed. Again, many of these lines contained hydrocarbons. This work was completed at the Main Facility in March 2014.

Additional information concerning these activities can be found in the project files located at the Hartford facility.

3.9 OUTSIDE ACTIVITIES

As previously discussed, there are a number of pipelines and other assets within the Premcor Facility that are owned and operated by others and which Premcor has no control over. There have been documented and undocumented releases from these assets that have impacted areas no longer owned and/or controlled by Premcor but are within areas Premcor is required to investigate and remediate. Such release include, but are not limited to the examples identified below, which are located within the portions of the Main Facility located south of East Hawthorne Street (South Property) that Premcor sold in 1999:

- On November 14, 2005, WRPL reported the release of 169 barrels of a high sulfur diesel fuel from their Tank #4 (Illinois Emergency Management Agency [Illinois EMA] Incident Number 20051536). This tank is located in the southwest quadrant of the South Property (see Figure 2-2). The cause of the release was determined to be two (2) holes that had been burned through the floor of Tank #4 during repair work conducted as part of routine tank maintenance. On October 7, 2009, WRPL (aka Buckeye Partners, L.P.) entered into a Consent Decree (No. 2:07-cv-02052-MPM-DGB) with the State of Illinois to address this release.

- On December 30, 2013, Marathon reported the release of 1491 barrels of a mixture of automotive gasoline and diesel fuel (transmix) at Tank #5 that they are operating on property believed to be owned by WRPL (Illinois EMA Incident Number H-2013-1366). This tank is located in the southwest quadrant of the South Property (see Figure 2-2). The cause of the release was a broken valve on one of the lines leading to Tank #5. Marathon is addressing the release.

More detailed information concerning these two releases is included in the *Alternate Source Demonstration* document provided to the Illinois EPA on March 7, 2016, and approved on April 30, 2018.

4.0 CONCEPTUAL SITE MODEL

The conceptual site model (CSM) for the Premcor Facility was developed based on the available information on geology, hydrogeology, hydrology, contaminant sources (primary and secondary), primary and secondary release mechanisms, contaminant migration pathways, exposure routes, and receptors. The CSM is continuously being reviewed in the light of new information and updated as appropriate. Future updates to the CSM will be presented under the Strategic Plan frame work.

A graphical presentation of the CSM was prepared in accordance with *ASTM E1689-95 (reapproved 2014) Standard Guide for Developing Conceptual Site Models for Contaminated Sites* and is provided as Figure 4-1. The components of the CSM are summarized in the following sections. The documents referenced in the following discussion are listed on Table 4-1.

The current understanding of the area geology, hydrogeology and hydrology is summarized in Section 2.4 of this report and is detailed in Site Wide Soil Group investigation work plans and reports. See References #1 through #11 as listed in Table 4-1.

4.1 CONTAMINANT SOURCES

Contaminant sources have been divided into primary sources and secondary sources. The primary sources at the Premcor Facility are former refinery and terminal operations. The secondary sources are soil containing constituents of concern (COC) and free product or LNAPL. The COCs for the Premcor Facility consist of the Skinner List (Appendix 3 of the Consent Order dated XXX XX, 2018).

4.1.1 Primary Sources

The documented releases and spills associated with past refinery and terminal operations at the Premcor Facility based on the available information have been summarized in the *Current Conditions Report* and the Site Wide Soil Group investigation work plans and reports. See References #1 through #12 as listed in Table 4-1.

4.1.2 Secondary Sources

4.1.2.1 Soil

General characterization of nature and extent of COCs in soil across the Premcor Facility has been completed through the Soil Group investigations and is presented in the Group 1 through Group 4 soil investigation reports and addenda (References #2 through #12 as listed in Table 4-1). Historical soil analytical data are also presented in the reports. Figures showing an overview of the findings compared with TACO Tier 1 soil remediation objectives are included in each investigation report.

The primary COCs detected in soil at the Premcor Facility include benzene, ethylbenzene, toluene, total xylenes, naphthalene, benzo(a)pyrene, benzo(a)anthracene, arsenic, chromium, and lead.

4.1.2.2 Free Product

Characterization of nature and extent of free product within the permeable strata in the Premcor Facility has been completed through the site wide free product investigation and is presented in the *Site Wide Free Product Investigation Report* and Addendum, and *Basis of Design Report for Site Wide Management of Free Product* (References #13 through #15 as listed in

Table 4-1). The estimated extent of the free product in the permeable strata is presented in the in the Annual and Second Quarter Progress Reports. The most recent (2017) Annual Status Report is provided as Reference #16 as listed in Table 4-1.

As part of the efforts to characterize the nature of the free product, samples were collected from monitoring wells across the Main Facility and tested by simulated distillation to evaluate the type of product. Graphs showing the simulated distillation curves for the product samples are included in References #14 and #15 as listed in Table 4-1. Based on the simulated distillation curves, almost all of the product samples fell between the gasoline and diesel simulated distillation reference curves. The couple of exceptions had a higher boiling point range than diesel.

4.2 RELEASE MECHANISMS

Release mechanisms are physical processes resulting in the movement of a contaminant from a source into a medium. The primary release mechanism at the Premcor Facility consists of infiltration and percolation of contaminants into the soil. The secondary release mechanisms identified at the Premcor Facility consist of dust and/or volatile emissions, storm water runoff, volatilization, and infiltration and percolation.

4.3 CONTAMINANT MIGRATION PATHWAYS

The potential contaminant migration pathways at the Premcor Facility consist of the following:

1. Wind transporting COCs in the form of vapors or absorbed to dust (particulates).
2. Storm water runoff resulting in the entrainment of soil particles and/or solubilization of COCs from the soil which settle out in ditches and surface water bodies as sediment.
3. Soil gas migration through the soil column and along natural and manmade permeable zones/corridors.
4. Dissolved phase groundwater migration.

These potential contaminant migration pathways have been investigated through the soil investigations, groundwater investigations and monitoring, and soil gas sampling. Based on the investigations, sampling, and data evaluation, the complete migration pathways include wind and stormwater. The soil gas migration pathway requires further investigation. The dissolved phase groundwater migration is an incomplete migration pathway for the groundwater ingestion exposure route, but the contribution to soil gas requires further investigation.

4.3.1 Wind

Dust and/or volatile emissions can be transported by wind from the source in the direction of the prevailing wind. In addition, the wind can erode and entrain particles of soil containing COCs. The significance of this pathway was evaluated through the combined ingestion, inhalation, and dermal contact Tier 2 RBCA equations in the Partial Closure Area Corrective Action Objectives Reports (References #17 through #19 as listed in Table 4-1). Areas of soil exceeding the Tier 2 Corrective Action Objectives (CAOs) will be addressed in accordance with the Strategic Plan.

4.3.2 Storm Water

Storm water runoff on the Main Facility is directed via ditches and sewers through an oil / water separator and discharged to the Guard Basin in accordance with Premcor's *Storm Water Pollution Prevention Plan*. When the Guard Basin reaches appropriate operational levels, water is pumped through a sewer to the onsite WWTP where it is treated and discharged to the Fire Pond and/or via sewer to the Mississippi River in accordance with Premcor's National Pollutant Discharge Elimination System (NPDES) permit.

4.3.3 Soil Gas

The volatilization of COCs or LNAPL in soil or groundwater creates soil gas in the air-filled pore spaces. Soil vapor can then migrate along natural and manmade permeable zones/corridors

such as subsurface utility backfill. The permeable strata consist of the North Olive, EPA, and Main Sand as well as permeable lenses in the A Clay and B/C Clay. The locations of known utilities are presented in the Soil Group investigation work plans and reports (see References #2 through #12 as listed in Table 4-1. Investigation of soil vapor occurrence has been conducted along the WPB of the Main Facility through the installation and sampling of soil gas monitoring probes and is presented in *Vapor Monitoring Ports Quarterly Reports* (Reference #20 as listed in Table 4-1. A future investigation of the indoor air inhalation exposure route will be conducted as discussed in Section 4.4.2.

4.3.4 Groundwater

Infiltration and percolation of COCs and LNAPL through the soil column has resulted in impact to groundwater at the Premcor Facility. The investigation and monitoring of the dissolved phase occurrence and extent has been ongoing since 2004. A network of monitoring wells is being sampled semiannually and the data and associated maps showing the dissolved phase extent is presented in the Annual and Second Quarter Progress Reports. The most recent (2017) Annual Status Report is provided as Reference #16 as listed in Table 4-1.

4.4 EXPOSURE ROUTES

The potential exposure routes consist of inhalation of vapors (outdoor and indoor), ingestion of impacted soil or groundwater, and ecological. The status of the evaluation of the exposure routes are summarized on Table 4-2. The remaining work to address these exposure routes and meet Agency-approved CAOs is presented on Figure 4-2. These exposure routes are briefly describe in the following sections.

4.4.1 Outdoor Inhalation Exposure Route

The outdoor inhalation exposure route has been evaluated through the site wide soil investigations and comparison of COC concentrations in soil with Tier 1 and 2 CAOs in the

PCAs (see References #17, #18, and #19 as listed in Table 4-1). Soil exceeding CAOs will be addressed in accordance with the Strategic Plan. In the remaining areas of the site, CAOs will be established in the future for comparison with COC concentrations in soil.

4.4.2 Indoor Air Inhalation Exposure Route

The indoor air inhalation exposure route will be evaluated during future investigations in accordance with the Strategic Plan. These investigations will target existing buildings within the non-PCAs of the Main Facility. There are no existing buildings in the PCAs and the indoor air inhalation exposure route in these areas is being excluded as discussed in the CAORs (see References #17, #18 and #19 as listed in Table 4-1. The indoor air inhalation exposure route is incomplete for area residents with the current systems in place on the Western Property Boundary.

4.4.3 Soil Ingestion Exposure Route

The soil ingestion exposure route has been evaluated through the site wide soil investigations and comparison of COC concentrations in soil with Tier 1 and 2 CAOs (see References #17, #18, and #19 as listed in Table 4-1. In the PCAs, soil exceeding CAOs will be addressed in accordance with the Strategic Plan. In the remaining areas of the site, CAOs will be established in the future for comparison with COC concentrations in soil.

4.4.4 Groundwater Ingestion Exposure Route

The groundwater ingestion exposure route is incomplete based on a potable well survey conducted by SMA in September 2017 and the Village of Hartford groundwater use ordinance (see Reference #17 as listed in Table 4-1. According to the potable well survey, the only potable wells that were identified within a mile radius of the Premcor Facility are two Village of Hartford municipal Wells #3 and #4. These wells are beyond the extent of the dissolved phase plume within the Premcor Facility. The Village of Hartford has a groundwater use ordinance for

the corporate limits, excepting that portion of the corporate limits that is south of East Hawthorne Street including the portion of the River Dock Area south of the line of Hawthorne Street extended west. The groundwater use ordinance prohibits the installation of potable water wells including within the Village of Hartford itself.

4.4.5 Ecological Exposure Route

The ecological exposure route is only applicable to the lagoon, pond, and borrow pit sediments in the River Dock Area. This exposure route is discussed and evaluated in the *Path Forward Approach for River Dock Sediments* prepared by GEI Consultants, Inc. (dated May 11, 2018).

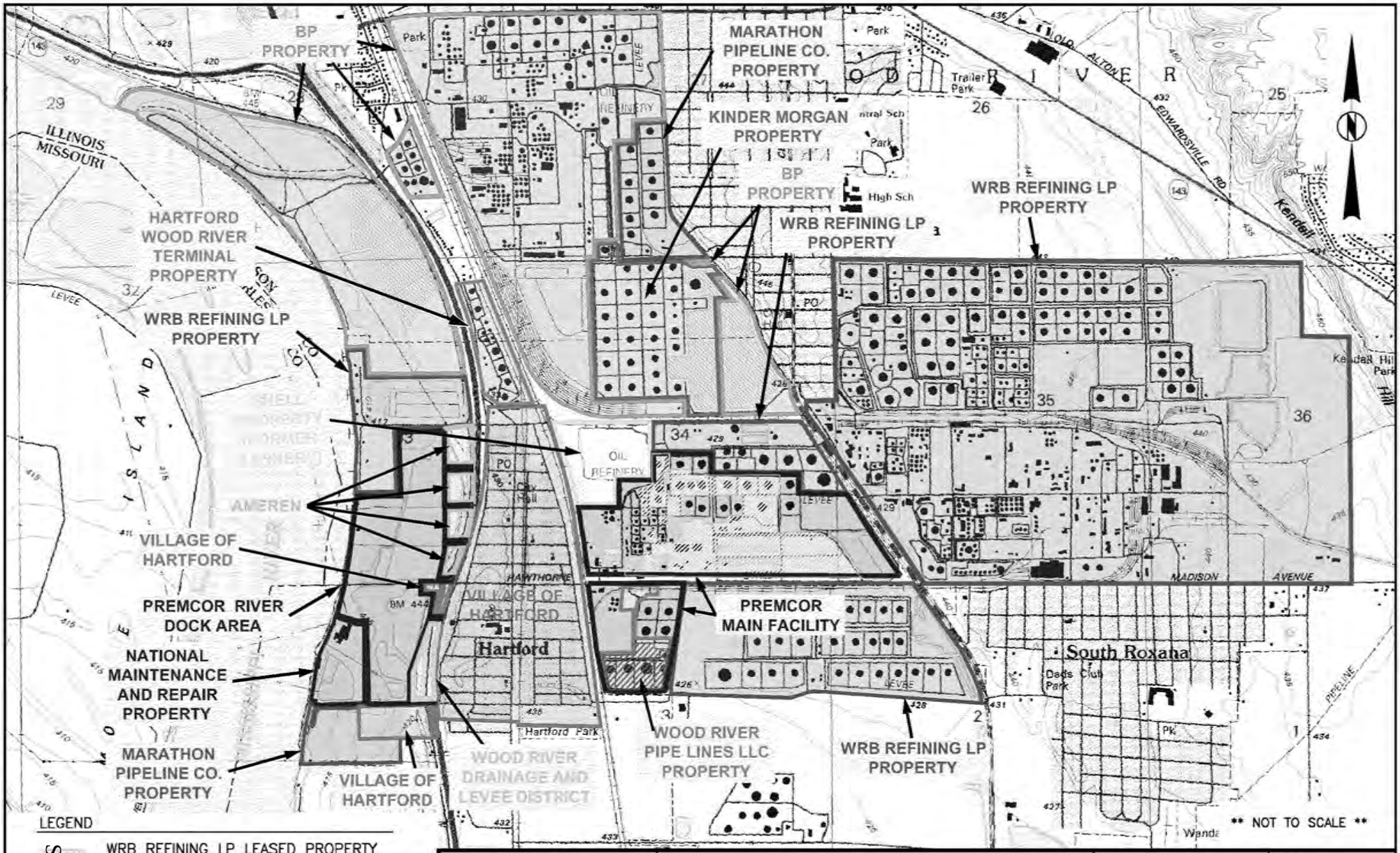
4.5 POTENTIAL RECEPTORS

The potential receptors on the Premcor Facility include employees, subcontractors, and other individuals (e.g., visitors) that may be present on the facility from time to time and based upon their activity. In the River Dock Area, potential receptors also include trespassers. Based on the available information on contaminant migration pathways and exposure routes, the potential offsite receptors include individuals that may be employed on adjoining properties and Village of Hartford residents bordering the Main Facility Western Property Boundary. Onsite workers may be exposed to COCs via soil ingestion (e.g., eating with unwashed hands, windborne dust settling on food or eating surfaces) and/or inhalation of vapors or dust outdoors or inside buildings.

5.0 MOVING FORWARD

Premcor has worked cooperatively with the Illinois EPA in developing a *Strategic, Tactical, and Operational Plan for Site Wide Investigation/Remediation Work* that is attached to the Consent Order dated XXX XX, 2018. This Strategic Plan defines the approach to permanently remediate the site and details the requirements to transition from ongoing project activities and investigation work to final remedial action at the Facility. This Project Background document should be read in conjunction with the Strategic Plan.

FIGURES



LEGEND

WRB REFINING LP LEASED PROPERTY ON THE PREMCOR FACILITY

MARATHON PIPE LINE LLC OPERATIONS ON THE WRPL LLC PROPERTY

SOURCE:
USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP
(WOOD RIVER, ILL.–MO. – rev.1994)

SR0001198

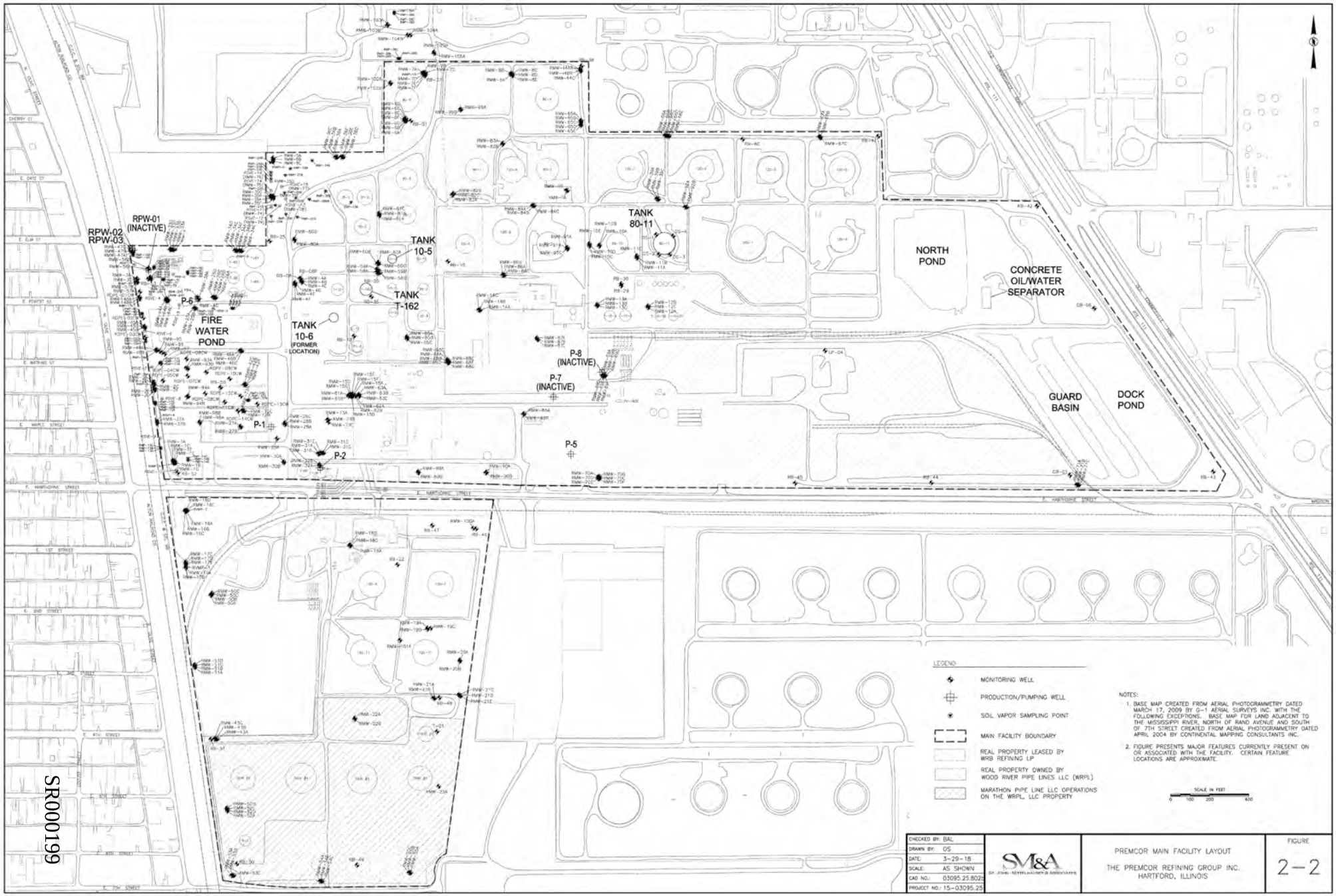
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SCALE	AS SHOWN
CAD NO.	03095.25.802a
PRJ NO.	15–03095.25–802

PREMCOR FACILITY AND SURROUNDING AREA MAP

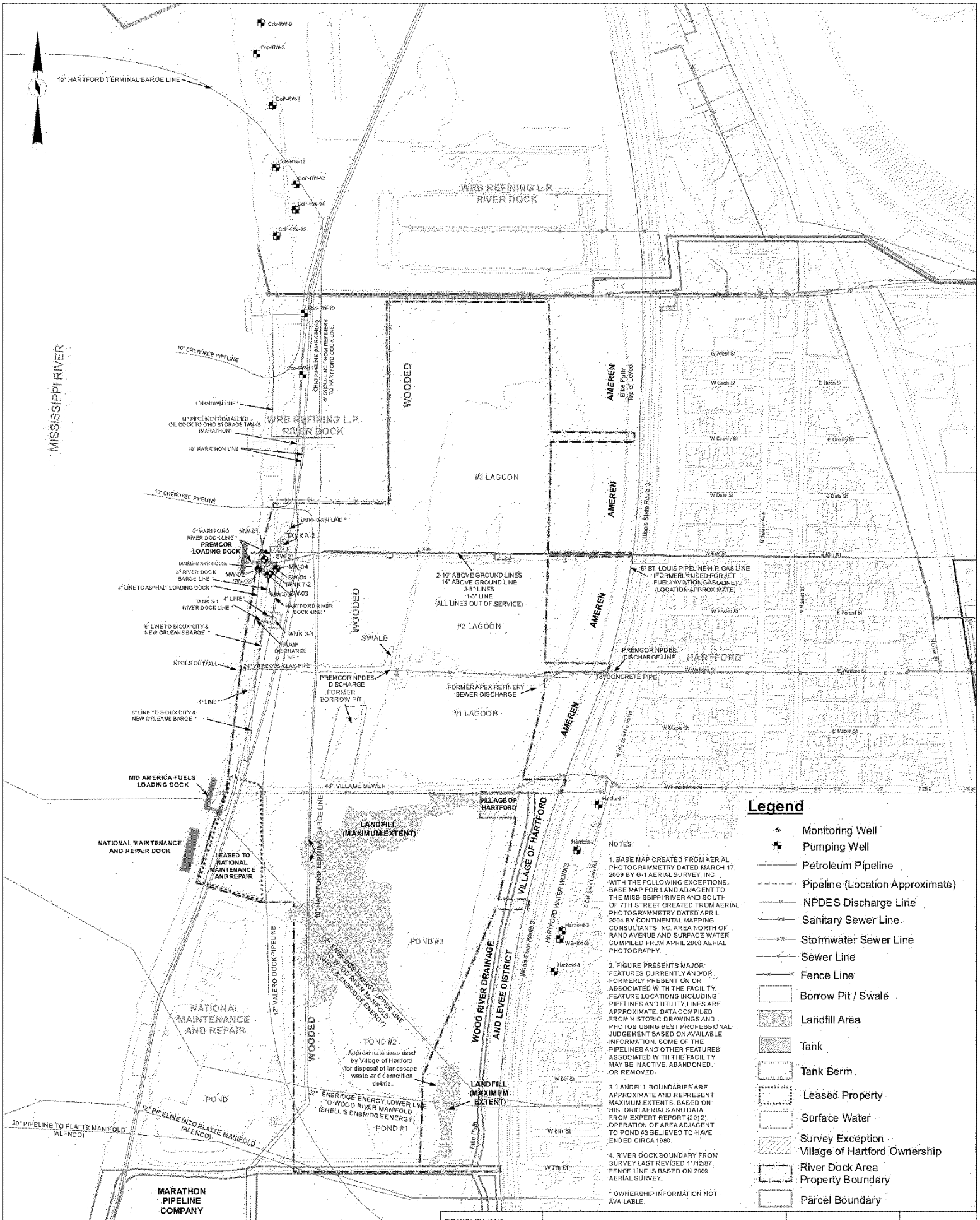
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SM&A
ST. JOHN MITTELHAUSER & ASSOCIATES

FIGURE
2–1


RPW-01
(INACTIVE)
RPW-02
RPW-03
P-6
FIRE
WATER
POND
TANK
10-5
TANK
T-162
TANK
10-6
(FORMER
LOCATION)
TANK
80-11
NORTH
POND
CONCRETE
OIL/WATER
SEPARATOR
P-8
(INACTIVE)
P-7
(INACTIVE)
P-1
P-2
P-5
GUARD
BASIN
DOCK
POND
LEGEND
MONITORING WELL
PRODUCTION/PUMPING WELL
SOIL VAPOR SAMPLING POINT
MAIN FACILITY BOUNDARY
REAL PROPERTY LEASED BY
WRB REFINING LP
REAL PROPERTY OWNED BY
WOOD RIVER PIPE LINES LLC (WRPL)
MARATHON PIPE LINE LLC OPERATIONS
ON THE WRPL, LLC PROPERTY
NOTES:
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2009 BY G-1 AERIAL SURVEYS INC. WITH THE FOLLOWING EXCEPTIONS. BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC.
2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. CERTAIN FEATURE LOCATIONS ARE APPROXIMATE.
SCALE IN FEET
0 100 200 400
CHECKED BY: BAL
DRAWN BY: OS
DATE: 3-29-18
SCALE: AS SHOWN
CAD NO.: 03095.25.802
PROJECT NO.: 15-03095.25
SM&A
PREMCOR MAIN FACILITY LAYOUT
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
FIGURE
2-2

SR000196



Legend

- Monitoring Well
- Pumping Well
- Petroleum Pipeline
- Pipeline (Location Approximate)
- NPDES Discharge Line
- Sanitary Sewer Line
- Stormwater Sewer Line
- Sewer Line
- Fence Line
- Borrow Pit / Swale
- Landfill Area
- Tank
- Tank Berm
- Leased Property
- Surface Water
- Survey Exception
  Village of Hartford Ownership
- River Dock Area
  Property Boundary
- Parcel Boundary

NOTES:

1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2009 BY G-1 AERIAL SURVEY, INC. WITH THE FOLLOWING EXCEPTIONS: BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC. AREA NORTH OF RAND AVENUE AND SURFACE WATER COMPILED FROM APRIL 2000 AERIAL PHOTOGRAPHY.

2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY AND/OR FORMERLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. FEATURE LOCATIONS INCLUDING PIPELINES AND UTILITY LINES ARE APPROXIMATE. DATA COMPILED FROM HISTORIC DRAWINGS AND PHOTOS USING BEST PROFESSIONAL JUDGEMENT BASED ON AVAILABLE INFORMATION. SOME OF THE PIPELINES AND OTHER FEATURES ASSOCIATED WITH THE FACILITY MAY BE INACTIVE, ABANDONED, OR REMOVED.

3. LANDFILL BOUNDARIES ARE APPROXIMATE AND REPRESENT MAXIMUM EXTENTS, BASED ON HISTORIC AERIALS AND DATA FROM EXPERT REPORT (2012). OPERATION OF AREA ADJACENT TO POND #3 BELIEVED TO HAVE ENDED CIRCA 1980.

4. RIVER DOCK BOUNDARY FROM SURVEY LAST REVISED 11/12/87. FENCE LINE IS BASED ON 2009 AERIAL SURVEY.

* OWNERSHIP INFORMATION NOT AVAILABLE.

DRAWN BY: KAK	
CHECKED BY: GP	
DATE: 5-11-18	
SCALE: AS SHOWN	
PROJECT NO.: 15-03095	

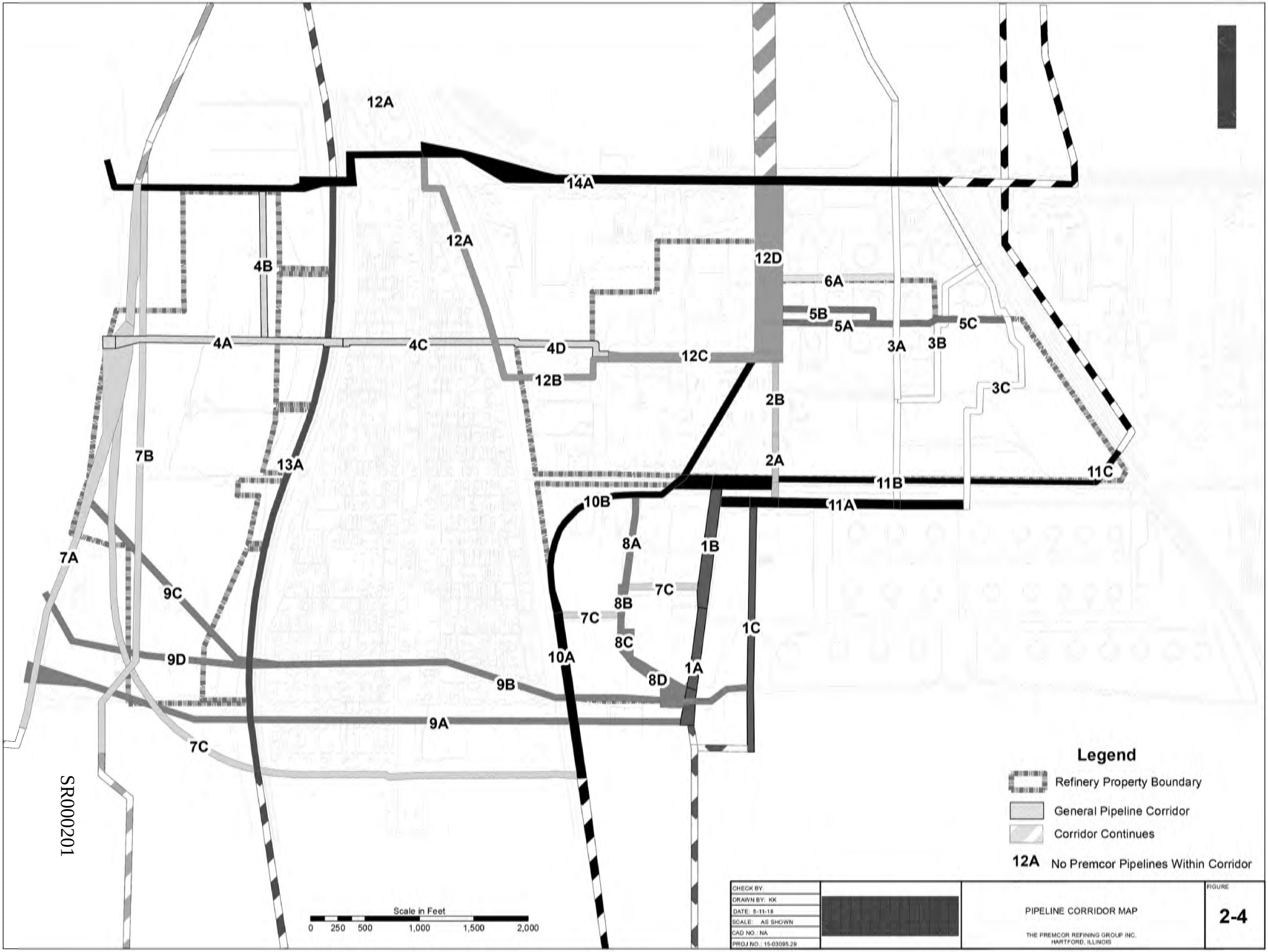
PREMCOR RIVER DOCK AREA
SITE FEATURES MAP

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

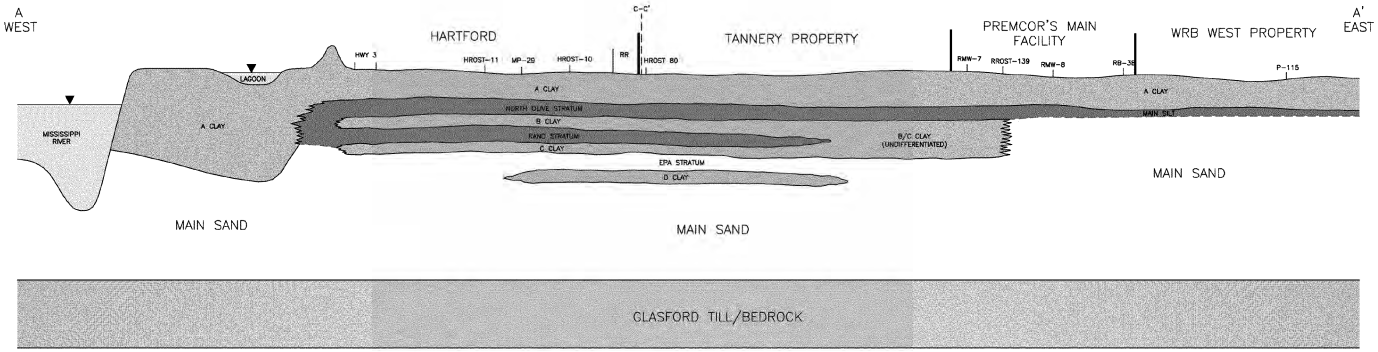
SR000200

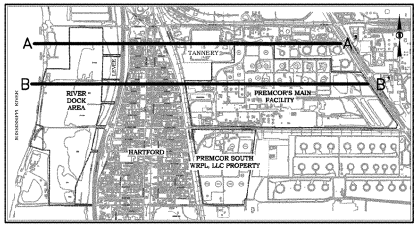
SVM&A
ST. JOHN, MITCHELL, MAHLER & ASSOCIATES

FIGURE
2-3

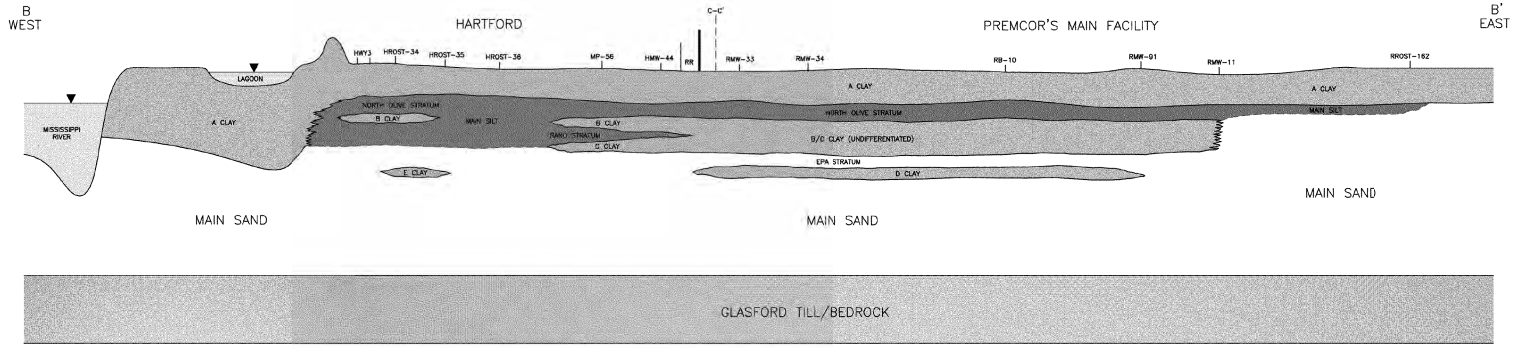

12A
14A
12A
4B
12D
6A
5B
5A
5C
4A
4C
4D
12C
3A
3B
12B
3C
2B
7B
13A
2A
11C
11B
10B
11A
8A
1B
7A
9C
7C
8B
7C
1C
8C
9D
10A
1A
8D
9B
9A
7C
Legend
Refinery Property Boundary
General Pipeline Corridor
Corridor Continues
12A No Premcor Pipelines Within Corridor
Scale in Feet
0 250 500 1,000 1,500 2,000
CHECK BY:
DRAWN BY: KK
DATE: 5-11-18
SCALE: AS SHOWN
CAD NO.: NA
PROJ NO.: 15-03095.29
PIPELINE CORRIDOR MAP
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
FIGURE
2-4

SR000201





CROSS - SECTION REFERENCE MAP
NOT TO SCALE



SR000202

NOTES:

1. VERTICAL AND LATERAL EXTENT OF GEOLOGIC STRATA REFLECT GENERALIZED REPRESENTATIONS FOR THE PURPOSE OF SIMPLIFYING THE UNDERSTANDING AND IDENTIFICATION OF THE MAJOR LITHOLOGIC STRATA WITHIN THE HARTFORD AREA.
2. VERTICAL EXTENT OF STRATA NOT TO SCALE.
3. BORING AND WELL LOCATIONS ARE FOR REFERENCE ONLY AND MAY BE PROJECTED TO THE CROSS-SECTION TRANSECT.

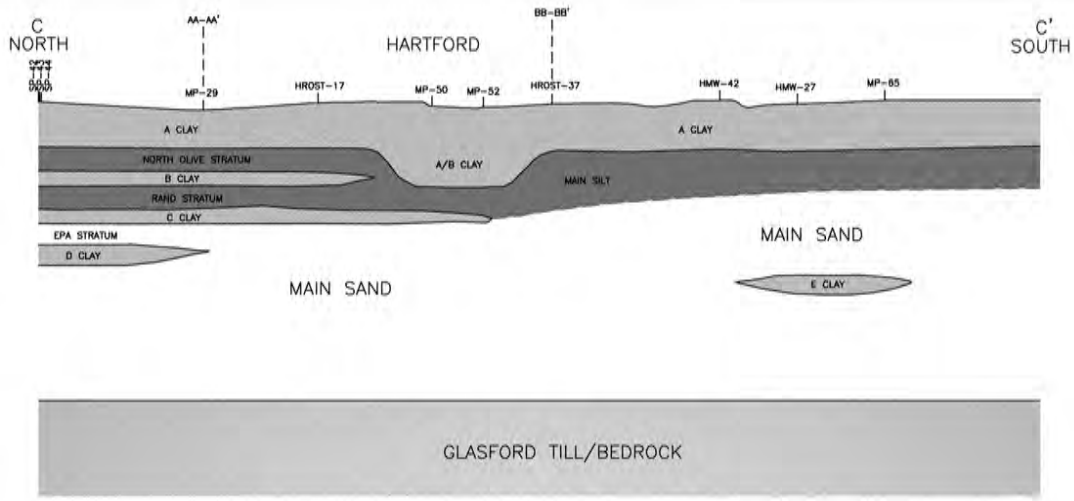
APPROXIMATE HORIZONTAL SCALE IN FEET
0 200 400 800

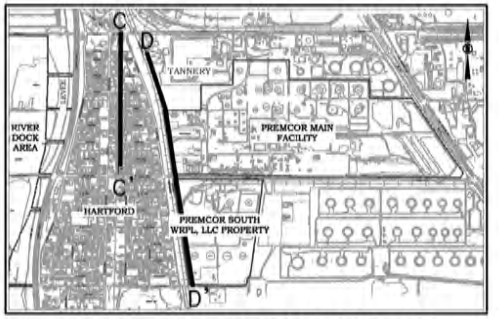
CHECK BY: DL	
DRAWN BY: OS	
DATE: 1-15-18	
SCALE: AS SHOWN	
CAD NO.: 03095.25.802J	
PRJ NO.: 15-03095.25	

SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES

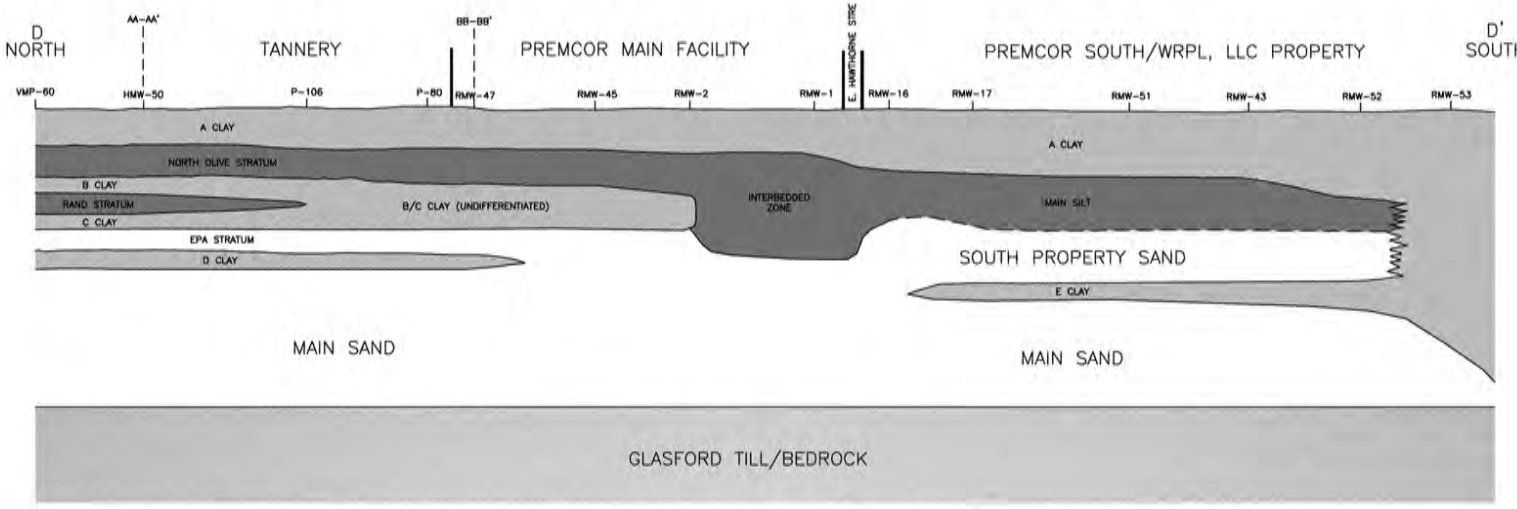
GENERALIZED GEOLOGIC CROSS-SECTIONS
A-A' AND B-B'
HARTFORD, ILLINOIS AREA

FIGURE
2-5





CROSS - SECTION REFERENCE MAP
NOT TO SCALE



APPROXIMATE HORIZONTAL SCALE IN FEET
0 200 400 800

NOTES:

1. VERTICAL AND LATERAL EXTENT OF GEOLOGIC STRATA REFLECT GENERALIZED REPRESENTATIONS FOR THE PURPOSE OF SIMPLIFYING THE UNDERSTANDING AND IDENTIFICATION OF THE MAJOR LITHOLOGIC STRATA WITHIN THE HARTFORD AREA.
2. VERTICAL EXTENT OF STRATA NOT TO SCALE.
3. BORING AND WELL LOCATIONS ARE FOR REFERENCE ONLY AND MAY BE PROJECTED TO THE CROSS-SECTION TRANSECT.

CHECK BY	DL
DRAWN BY	OS
DATE	1-15-18
SCALE	AS SHOWN
CAD NO.	03095.25.802i
PRJ NO.	15-03095.25

GENERALIZED GEOLOGIC CROSS SECTIONS
C-C' AND D-D'
HARTFORD, ILLINOIS AREA

SVM&A
ST. JOHN, MITTELHAUSER & ASSOCIATES

FIGURE
2-6

SR000203

GEOLOGY AND HYDROGEOLOGY OF THE HARTFORD, ILLINOIS AREA

HARTFORD AREA DESCRIPTION

The Hartford Refinery (if active) currently owned by The Premcor Refining Group Inc. (Premcor) is located at 201 East Hawthorne Street, in Hartford (Madison County), Illinois. This 600-acre Facility consists of the property, currently or formerly operated by Premcor and others, as an oil refinery (opened in 1941) that includes the "Main Facility" and the "River Dock Area" (mostly crude storage). The Main Facility is situated in the south half of Section 34 and the southwest quarter of Section 35, Township 6 North, Range 9 West; and the northwest quarter of Section 3, Township 4 North, Range 9 West. The River Dock Area is situated west of Illinois State Route 3 in the north half of Section 4, Township 4 North, Range 9 West and the south half of Section 33, Township 5 North, Range 9 West. Bordering the River Dock Area on the west is the Mississippi River.

The Main Facility is primarily bordered to the north, south and east by petroleum refining and terminal operations and to the west by the Village of Hartford. This area is served by numerous pipeline systems for delivery and distribution of crude oil and refined petroleum products. In addition to the petroleum pipelines owned and/or operated by several companies or their related entities, known to have either currently or previously owned and/or operated(d) petroleum pipelines in the area, those companies include, but may not be limited to: British Petroleum (BP, formerly Amoco), WRB Refining L.P. which is operated by Phillips 66 (a spinoff from Conoco-Phillips (ConP)), Shell Oil Company (Shell), Sinclair Oil Company (Sinclair), Apex Oil Corporation (Apex), Premcor, Atlantic-Richfield Company (ARCO), TOSCO, Whitefish, Buckeye Terminals, LLC (Buckeye), Chartwell Pipeline, Explorer Pipeline, Roth Industries, Marathon Ashland Petroleum, Ozark Pipeline, Pride Pipeline (Pride), Enbridge, St. Louis Pipeline, EnCana, Kinder Morgan, Plains All American Pipeline and Texaco Pipelines. Some of these companies maintain pipeline right-of-ways through the Main Facility.

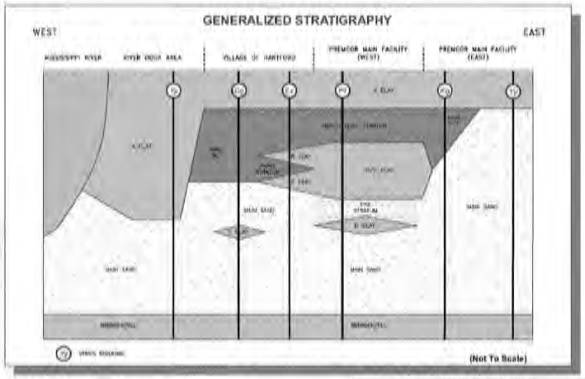
Besides the petroleum-related industry in the surrounding area, the International Shoe Company (1917 to 1985/1970) operated a tannery immediately north of the northwestern portion of the Main Facility. This property is known as the Tannery Property and is currently owned by Shell.

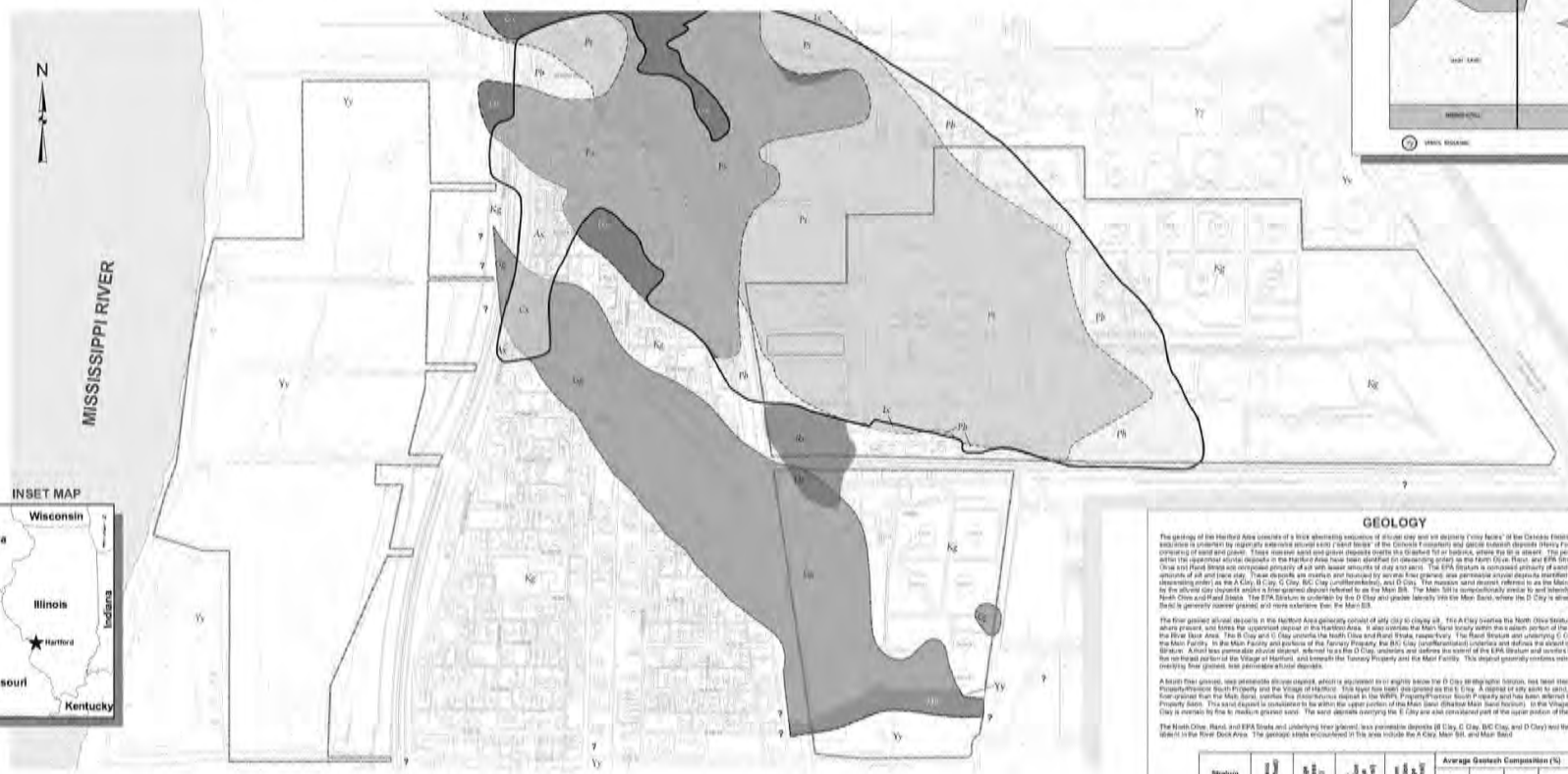
HARTFORD REFINERY OWNERSHIP HISTORY

The Wood River Oil and Refining Company, Inc. (aka Roxo) completed construction of the Hartford Refinery in May 1941. In 1950, "the Sinclair" (later acquired by ARCO) acquired the Hartford Refinery. Lion Terminal operated the Facility in the 1957, when Roxo Oil and Refining Corporation (Roxo) sank (a Wisconsin Corporation) purchased the Facility. That purchase excluded the bulk storage and terminal operation now owned by Hartford Wood River Terminal (HWRT) located northeast of the Main Facility by the St. Louis Road and Rand Avenue in Hartford. In 1981, Apex acquired Clark Oil and Refining Corporation, which continued operating the Hartford Refinery until 1988. Apex and its subsidiaries filed for bankruptcy protection under Chapter 11 of the federal Revenue Code in 1987. In 1988, AOC Holdings Inc. (AOC (80%) owned by The Hindalco Corporation of Toronto) negotiated with the debtors to purchase certain assets of Apex including the Hartford Refinery. Subsequently, AOC was renamed Clark Oil & Refining Corporation (a Delaware Corporation), which became Clark Refining and Marketing, Inc. (New Clark, and the seller, Premcor, in May 2000. In September 2002, Premcor ceased petroleum refining operations and continued operations only as a bulk storage and terminal distribution facility. WRB Refining LP purchased certain petroleum refining assets and leased the underlying real estate associated with those assets from Premcor in July 2003. WRB Refining L.P. leases areas that are referred to as "Dedicated Wood", which supports refining operations in their South Roxana refinery located east of Premcor. Valero Energy Corporation (Valero) acquired Premcor on September 1, 2005. Premcor, a wholly owned subsidiary of Valero, owns the Facility currently known as the Valero Terminaling and Distribution Company facility.

In December 1999, Premcor sold portions of the property south of Hawthorne Street to Equilon Enterprises LLC (Equilon) and, while not entering the transactional details, Premcor believes that thereafter Equilon transferred the property to Buckeye. In 2004, which subsequently transferred it to Wood River Pipe Lines LLC (WRPL) in 2007. In February 2010, WRPL transferred operations of its above ground storage tanks in this area to Hamilton Pipe Line LLC.

GENERALIZED STRATIGRAPHY





HYDROGEOLOGY

North Olive Stratum

The North Olive Stratum is the uppermost permeable stratum in the Hartford Area. The occurrence of groundwater in the North Olive Stratum is dependent on precipitation inputs and consists of localized areas of unsaturated to confined perched groundwater. There is a groundwater mound within this stratum primarily beneath the Tannery Property, where groundwater flows into the Village of Hartford and the Main Facility.

Rand Stratum

The Rand Stratum is the next permeable stratum within the Hartford Area. The occurrence of groundwater in this stratum is dependent on precipitation inputs and also consists of localized areas of unsaturated to confined perched water. This stratum is generally less saturated in the Village of Hartford. However, during times when the Mississippi River stage is higher or at or above Rand stage, the elevation of the groundwater surface can reach and provide recharge to the Rand Stratum in the Village of Hartford. In addition, there is a groundwater mound or divide in this stratum located in the northwest portion of the Tannery Property and north of Rand Avenue. Groundwater flow from this mound or divide flows into the Village of Hartford, the Tannery Property, and north of Rand Avenue.

EPA Stratum

EPA Stratum - Groundwater in the EPA Stratum can be confined or locally unconfined depending on the elevation of the groundwater surface. This stratum is hydraulically and vertically separated from the Main Sand, except along its boundaries, because of the presence of the fine-grained deposits within the D Clay. The restriction in vertical groundwater flow promotes the accumulation of groundwater and creates mounding within the stratum. The large groundwater mound within the EPA Stratum is located at the area of the Tannery Property and extends into the west-central portion of the Main Facility. This mound also extends north of Rand Avenue and towards the confirmed into the BP Riverfront Property. The axis of the groundwater mound in the EPA Stratum is oriented northwest-southeast along the center of the stratum. Groundwater in the EPA Stratum and within the Main Facility flows southeast along the axis of the mound and southeast and northeast along its flanks toward the margins of the D Clay. This stratum is hydraulically connected to the Main Sand and groundwater beyond the edges of the D Clay flows in the direction of the prevailing hydraulic gradients within the Main Sand.

A groundwater convergence zone (see diagram below) occurs along the eastern extent of the D Clay where groundwater flow from the EPA Stratum and Main Sand converge. Depending on the direction of regional groundwater flow in the Main Sand, this convergence zone can occur along the southern and eastern margins of the D Clay. The groundwater convergence zone along the eastern margin of the D Clay occurs during periods of sustained low river stage as groundwater pressures from the Main Sand overlying perched water in the North Olive and Rand Strata. Additionally this stratum is recharged from groundwater in the Main Sand during periods of sustained and higher Mississippi River stages due to bank storage within the Main Sand aquifer.

Horizontal hydraulic gradients within the EPA Stratum range from approximately 0.001 to 0.01 foot/foot. The hydraulic conductivity of this stratum ranges from 1 to 40 feet/day with a porosities assumption of 1 feet/day.



Main Sand

The Main Sand, known regionally as the American Bottoms Aquifer, is the deepest and most extensive unconsolidated aquifer in the Hartford and surrounding areas. It has been used extensively as a groundwater resource by industry, municipalities and for irrigation and domestic water supplies. Pumping from this aquifer has altered the natural groundwater flow direction (predevelopment) creating a northerly regional groundwater flow direction towards the pumping centers.

The Mississippi River is the primary hydraulic boundary of the Main Sand Aquifer in the Hartford Area. Due to groundwater pumping in the area, the Mississippi River provides recharge to the aquifer north of Hawthorne Street. South of this, groundwater in the Main Sand discharges into the Mississippi River. In addition, during times of increasing and/or high river stage, the Mississippi River provides additional recharge as bank storage into the aquifer. During these times, groundwater flow in the Main Sand within the River Dock Area, Village of Hartford, and the eastern portion of the Main Facility is towards the northeast and east.

Groundwater in the Main Sand and Mesh Silt can be confined or unconfined where it underlies the C Clay, B/C Clay, and D Clay (detectively) depending on the elevation of the Mississippi River. In general, the horizontal hydraulic gradient across the site are low and averages approximately 0.001 to 0.002 foot/foot but increases within proximity to the pumping wells located at the WRB Refining L.P. River Dock, Village of Hartford municipal wells, and within the Main Facility. Groundwater flow in the Main Sand is generally (1) northwesterly north of the Village of Hartford, (2) northeasterly within the central portion of the Village of Hartford and along the eastern property boundary of the Main Facility, and (3) northerly to northwesterly in the central and eastern portions of the Main Facility. However, the regional groundwater flow direction is influenced by a combination of the Mississippi River stage and groundwater pumping at the regional pumping centers. The vertical gradients within the Main Sand are essentially horizontal groundwater flow in the aquifer. The geometric mean hydraulic conductivity values for this aquifer range from 0.01 to 614 feet/day. However, the hydraulic conductivity values can be approximately 150 feet/day or less in some areas within the Shallow Main Sand near the contact with the Mesh Silt and in the Main Sand below the D Clay.

Groundwater elevations within the Main Sand have fluctuated over the past several decades. Historical groundwater monitoring data indicate that the groundwater elevation was as high as 420 feet above mean sea level (msl). Groundwater elevations may have been higher at the time of the 1903 flood. Groundwater elevations in the Main Sand as low as approximately 370 feet msl to 375 feet msl also occur in the mid-1950's. It is believed that this period of lower groundwater elevations was due to the combined effects of maximum industrial groundwater use in the area and a period of low precipitation (drought) as evidenced by the lowest Main Mississippi River stages in the mid-1950's. Since circa early-1960's, the lowest river elevations in the Hartford Area have been approximately 390 to 397 feet msl as a result of the low water dam constructed upstream of the Chain of Rocks Canal.

GEOLOGY

The geology of the Hartford Area consists of a thick alternating sequence of silt-clay and silt deposits ("clay facies" of the Cahokia Formation). This sequence is underlain by regionally extensive alluvial sand ("sand facies" of the Cahokia Formation) and glacial outwash deposits (Henry Formation) consisting of sand and gravel. These coarse-sand and gravel deposits overlie the Bedford Till or bedrock, where the till is absent. The permeable zones within the uppermost alluvial deposits in the Hartford Area have been identified (in descending order) as the North Olive, Rand, and EPA Strata. The North Olive and Rand Strata are composed primarily of silt with lesser amounts of clay and sand. The EPA Stratum is composed primarily of sand with lesser amounts of silt and trace clay. These deposits are overlain and bounded by alluvial fine-grained, less permeable alluvial deposits identified locally (in descending order) as the A Clay, B Clay, C Clay, B/C Clay (undifferentiated), and D Clay. The naming and stratum reference is as the Main Sand, is overlain by the alluvial clay deposits and/or a fine-grained deposit referred to as the Main Silt. The Main Silt is compositionally similar to and laterally grades into the North Olive and Rand Strata. The EPA Stratum is underlain by the D Clay and grades laterally into the Main Sand, where the D Clay is absent. The Main Sand is generally coarser grained and more extensive than the Main Silt.

The finer grained alluvial deposits in the Hartford Area generally consist of silty clay to clayey silt. Thin A Clay overlies the North Olive Stratum and Main Silt, where present, and forms the uppermost deposit in the Hartford Area. It also overlies the Main Sand locally within the eastern portion of the Main Facility and the River Dock Area. The B Clay and C Clay underlie the North Olive and Rand Strata, respectively. The Rand Stratum and underlying C Clay are absent in the Main Facility. In the Main Facility and portions of the Tannery Property, the B/C Clay (undifferentiated) underlies and defines the extent of the North Olive Stratum. A thin less permeable alluvial deposit, referred to as the D Clay, underlies and defines the extent of the EPA Stratum and overlies the Main Sand or the ice-marginal portion of the Village of Hartford, and beneath the Tannery Property and the Main Facility. This deposit generally contains some silt from the overlying finer grained, less permeable alluvial deposits.

A basin fine grained, less permeable alluvial deposit, which is equivalent in or slightly below the D Clay stratigraphic horizon, has been identified in the WRB, Property/Premcor South Property and the Village of Hartford. This layer has been designated as the E Clay. A deposit of silty sand to sand, which is laterally and vertically continuous with the Main Sand, overlies the discontinuous deposit in the WRB, Property/Premcor South Property and has been referred to as the South Property Sand. This sand deposit is considered to be within the upper portion of the Main Sand (Shallow Main Sand horizon). In the Village of Hartford, the E Clay is overlain by fine to medium grained sand. The sand deposits overlying the E Clay are also considered part of the upper portion of the Main Sand.

The North Olive, Rand, and EPA Strata and underlying finer grained, less permeable deposits (B Clay, C Clay, B/C Clay, and D Clay) and the E Clay are absent in the River Dock Area. The geologic strata encountered in this area include the A Clay, Main Silt, and Main Sand.

Stratum Name	Thickness Range (feet)	Average Thickness (feet)	Top Elevation Range (feet msl)	Bottom Elevation Range (feet msl)	Average Geotech Composition (%)			
					Gravel	Sand	Silt	Clay
Premcor Main Facility and South Property [1]								
A Clay[2]	5 - 58	31	~434 - 422	415 - 362	0	4	40	56
North Olive	1 - 15	8	424 - 414	416 - 405	0	8	73	19
Main Silt	1 - 24	8	424 - 406	411 - 395	0	22	60	18
B/C Clay	2 - 25	14	417 - 406	405 - 392	0	4	38	57
EPA	2 - 15	8	406 - 394	395 - 385	1	76	16	7
D Clay	1 - 6	3	395 - 385	394 - 384	0	7	52	31
E Clay	2 - 11	6	391 - 384	382 - 377	0	8	36	52
Main Sand	53 - 100	73	422 - 362	370 - 299	4	85	9	3
Bedford Till	-	-	374 - 299	??	8	51	31	11
Premcor River Dock Area [3]								
A Clay[2]	5 - 43	26	~434 - 412	415 - 370	0	3	33	64
Main Silt	0 - 16	8	415 - 401	408 - 391	0	64	22	14
Main Sand	83 - 106	96	408 - 370	315 - 302	1	92	7	4
Village of Hartford [4]								
A Clay[2]	8 - 24	13	~425 - 413	424 - 402	0	8	44	45
North Olive	1 - 10	5	424 - 412	420 - 406	0	12	70	20
B Clay	1 - 22	8	420 - 406	412 - 395	0	4	46	52
B/C Clay	1 - 16	15	418 - 408	412 - 395	0	3	34	64
C Clay	1 - 11	5	416 - 406	410 - 400	0	15	67	18
EPA	1 - 11	6	410 - 400	405 - 395	0	6	32	62
Mesh Silt	2 - 22	12	420 - 400	414 - 384	0	41	48	11
EPA	5 - 9	7	403 - 395	395 - 389	0	75	17	8
D Clay	2 - 7	3	395 - 389	393 - 386	0	3	52	36
E Clay	2 - 14	7	391 - 379	385 - 365	-	-	-	-
Main Sand	77 - 107	94	414 - 364	335 - 300	2	87	7	4
Bedford Till	-	-	378 - 301	??	2	34	36	28
Tannery Property [5]								
A Clay[2]	8 - 27	14	~424 - 414	422 - 407	-	-	-	-
North Olive	1 - 8	4	422 - 416	418 - 411	-	-	-	-
B Clay	2 - 12	6	419 - 411	414 - 400	-	-	-	-
B/C Clay	3 - 25	18	417 - 413	402 - 391	-	-	-	-
Rand	1 - 13	8	414 - 403	408 - 395	-	-	-	-
C Clay	3 - 11	6	408 - 396	404 - 391	-	-	-	-
EPA	1 - 15	8	404 - 390	395 - 383	-	-	-	-
D Clay	1 - 11	6	395 - 383	389 - 381	-	-	-	-
Main Sand	-	-	411 - 416	??	-	-	-	-

Note:
(1) = Information was either not collected or was not available.
(2) = Based on data collected from 1995 through 2004 and as presented in the Group 4 (b) Investigation Report (SMA, 2014).
(3) = Restricted to depiction of alluvial features.
(4) = Based on data collected and presented in the Group 5 Soil Investigation Report (SMA, 2012).
(5) = Based on data collected from 1978 through 2003.
(6) = Based on data collected from 1978 through 2004.

STRATA DESCRIPTION

A CLAY

This stratum is the uppermost geologic unit present throughout the Hartford Area, extending and projecting out to the east of the Main Facility along Highway 111. The A Clay is composed primarily of silty clay to clayey silt with some localized coarser grained and permeable lenses. However, this stratum also contains various fill materials including asphalt, sand, and gravel particularly throughout the Village of Hartford and Main Facility.

NORTH OLIVE STRATUM

This stratum is overlain by the A Clay and underlain by the B Clay in the Village of Hartford and portions within the Tannery Property. Where the Rand Stratum is absent, the North Olive Stratum is underlain and defined by the extent of the B/C Clay. The North Olive Stratum is composed primarily of silt with lesser amounts of clay and trace sand to silty sand.

B CLAY

This stratum is overlain by the North Olive Stratum and consists primarily of silty clay to clayey silt.

RAND

This stratum is overlain by the B Clay and underlain by the C Clay, where present. The extent of the Rand Stratum is defined by the extent of the C Clay and is absent in the Main Facility. This stratum is composed primarily of silt with lesser amounts of clay and trace sand to silty sand.

C CLAY

This stratum is overlain by the Rand Stratum and consists primarily of silty clay to clayey silt.

B/C CLAY

This stratum occurs where the Rand Stratum is absent and underlies and defines the extent of the North Olive Stratum. It consists primarily of silty clay to clayey silt with some localized coarser grained and permeable lenses.

MAIN SILT

The Main Silt is compositionally similar to and laterally grades into the North Olive and Rand Strata. In addition, this deposit observes and vertically grades into the underlying Main Sand. It should be noted that this no stratum areas where the contact between this Main Silt and the Main Sand is gradational and difficult to interpret. The transitional zone is an area of interbedded sand, silts and clays which exists at the same horizon as the Main Silt in the northwest portion of the WRB, Property/Premcor South Property and the southmost portion of the Main Facility north of East Hawthorne Street. In addition, a thick sequence of Main Silt occurs along East Hawthorne Street, where it grades into and/or interfingers with the B/C Clay, EPA Stratum, and Main Sand. The Main Silt consists primarily of silt to sandy silt with varying amounts of clay.

TRANSITION ZONE

There is a silt transition zone below the edge of the B/C Clay that grades laterally into the Main Silt. This transition zone is encountered along the southern and eastern edges of the B/C Clay within the Main Facility.

EPA STRATUM

This stratum consists primarily of silt, silty sand, and fine sand. It is present in the northeastern portion of the Village of Hartford, beneath the Tannery Property, and within the western and central portions of the Main Facility. The extent of this stratum is defined by the extent of the underlying D Clay. The EPA Stratum is hydraulically connected with and laterally grades into the Main Sand along the extent of the D Clay.

D CLAY

This stratum underlies the EPA Stratum and is compositionally coarser grained (sandy silt to silty) than the other less granular, less permeable strata. The D Clay could be considered a discontinuous, less permeable lense within the Main Sand, based on its relative thickness and limited extent.

SOUTH PROPERTY SAND

This stratum is laterally continuous with and hydraulically connected to the Main Sand. This stratum is known to the extent of the E Clay encountered in the WRPL Property/Premcor South Property and is texturally finer grained than the Main Sand. However, it is considered to be within the Shallow Main Sand horizon. A portion of this sand deposit serves/lies by the Main Silt and the A Clay.

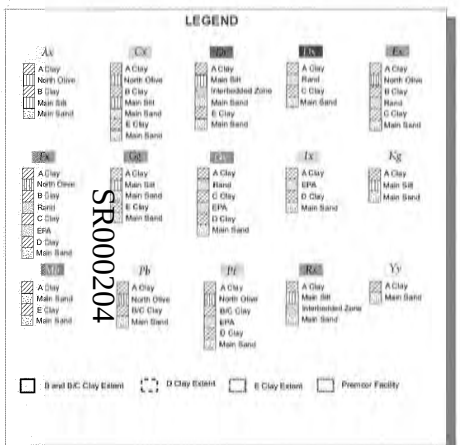
E CLAY

This stratum is encountered in the WRPL Property/Premcor South Property at the same stratigraphic horizon as the D Clay. The E Clay laterally grades into the A Clay (Clay Plug) towards the south. It also extends northwestward into the Village of Hartford. The E Clay consists primarily of clayey silt to silt.

MAIN SAND

The Main Sand is areally extensive throughout the Hartford Area and surrounding areas. The Main Sand is overlain by alluvial deposits and/or the Main Silt, and overlies the Bedford Till or bedrock, where the till is absent. The composition of the Main Sand consists primarily of sand to sand and gravel with trace amounts of silt and clay.

LEGEND



SR00020A4

CHECK BY: S.S.	GEOLOGY AND HYDROLOGY MAP - HARTFORD, ILLINOIS
DRAWN BY: AP	
DATE: 5-11-16	SM&A ST. JOHN, MITTELHAUSEN & ASSOCIATES
SCALE: AS SHOWN	FIGURE 2-07
PART NO.: 4000150B0	
PROJ NO.: 15-0005.01	

NOTES:

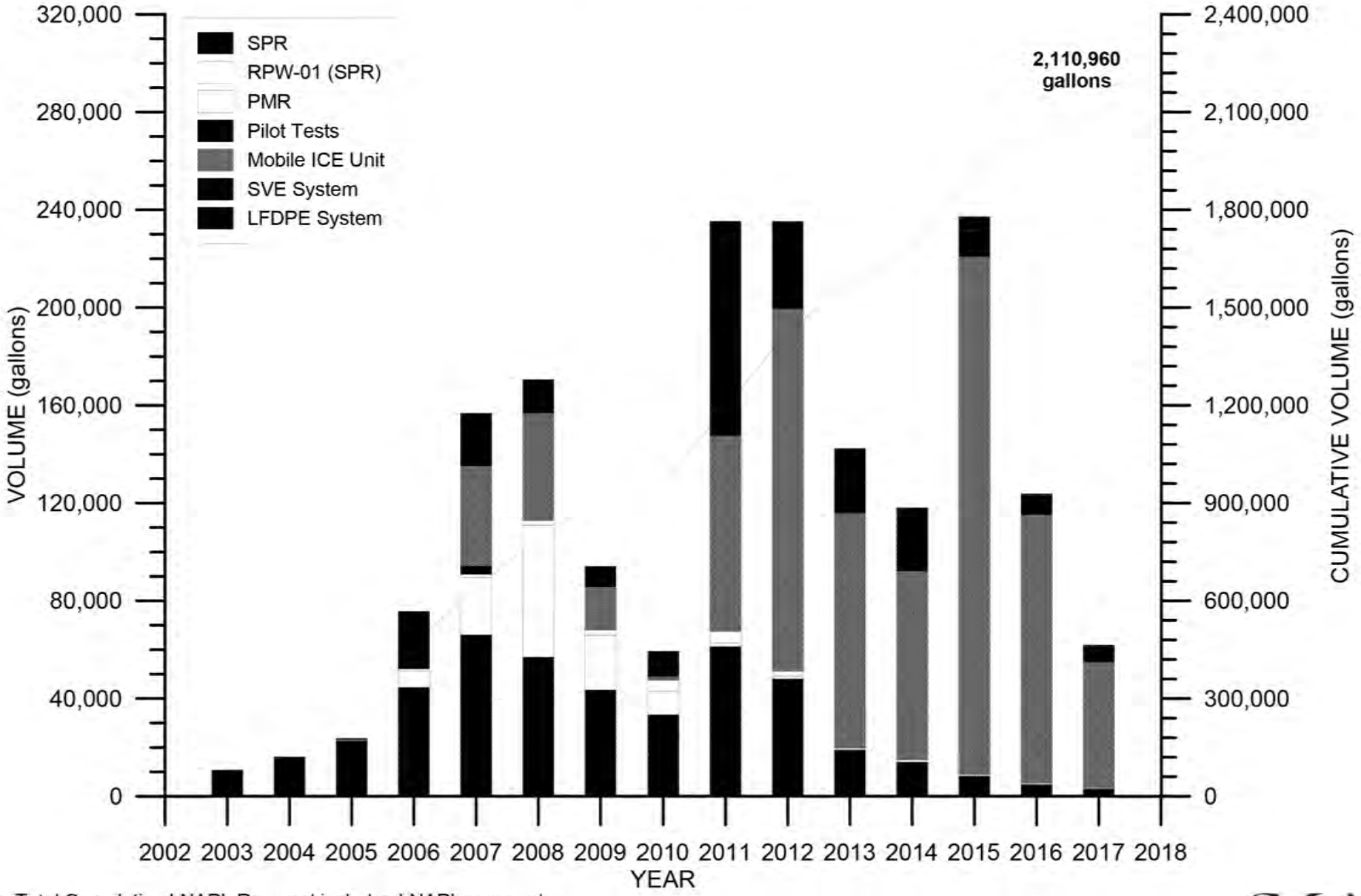
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2006 BY G-1 AERIAL SURVEYS INC. WITH THE FOLLOWING EXCEPTIONS: BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC.

2. THE GEOLOGY PRESENTED ON THIS MAP WAS GENERALIZED TO REPRESENT THE MAJOR LITHOLOGIC UNITS USING DATA THAT WAS AVAILABLE AT THE TIME OF PREPARATION. THE EXTENTS AND SEQUENCES OF THESE UNITS ARE BASED ON BEST PROFESSIONAL JUDGMENT MADE FROM THE INTERPRETATION AND EVALUATION OF SOIL BORING LOGS, CONE PENETROMETER PROFILES, GEOTECHNICAL DATA, AND STRUCTURE CONTOUR AND ISOPACH MAPS. THIS MAP MAY BE UPDATED AS NEW DATA OR INFORMATION BECOMES AVAILABLE.


Groundwater Convergence Zone Axes
Western
EPA Stratum
Groundwater Mound Axes
Groundwater Convergence Zone Axes
Eastern
Legend
Approximate Convergence Zone and Groundwater Mound Axes (2005-2017)
General Groundwater Flow Direction
Premcor Facility Boundary
Interpreted Extent of D Clay
0
150
300
600
900
Feet
SR000205
EPA STRATUM -
GROUNDWATER MOUND AXIS LOCATIONS AND
CONVERGENCE ZONE AXES LOCATIONS
SV&A
FIGURE
2-8

Figure 3-1
Annual LNAPL Removal by Technology
and Total Cumulative LNAPL Removal 2003 - 2017

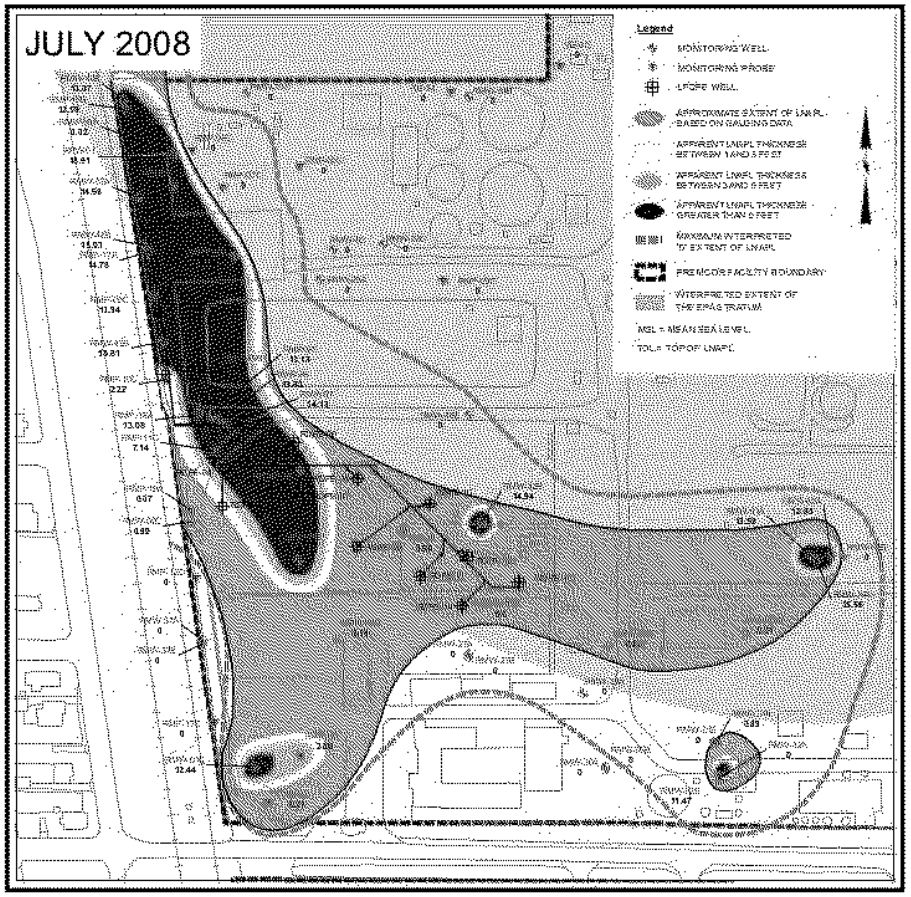
Premcor Main Facility/Hartford, Illinois



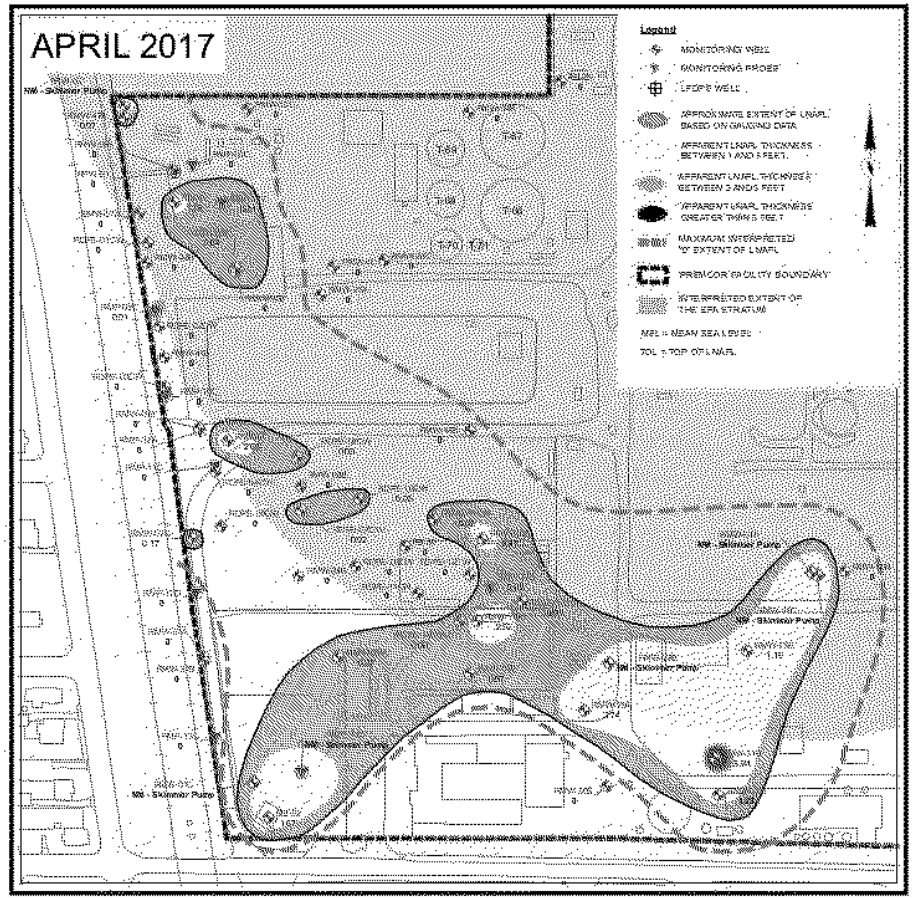
Note: The Total Cumulative LNAPL Removal includes LNAPL removed via LNAPL recovery pumps from 1994 through the end of 2002.

SR000206

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES



River Stage = 421.68' msl
RMW-97 = 412.21' msl (TOL)



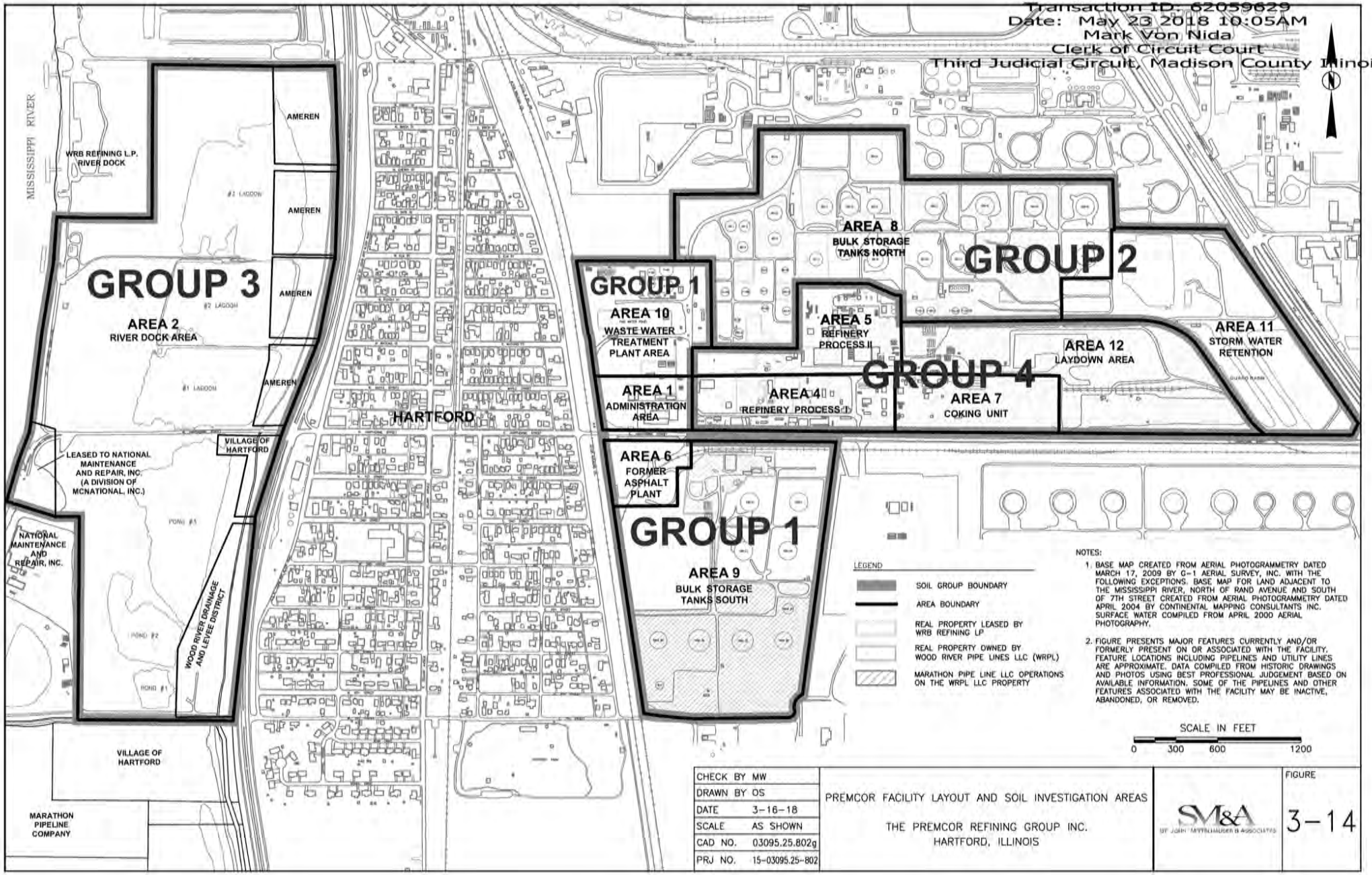
River Stage = 411.57' msl
RMW-97 = 401.55' msl (TOL)

SR000207

Scale in Feet
0 100 200 400

CHECK BY: DC DRAWN BY: RK DATE: 5-11-18 SCALE: AS SHOWN CAD NO.: NA PROJ NO.: 17-0909.21-100-007	SM&A ST. JOHN-MITTELHAMMER & ASSOCIATES	APPARENT LNAPL THICKNESS (WPB AREA) DURING CONFINED CONDITIONS THE PREMCOR REFINING GROUP INC. HARTFORD, ILLINOIS	FIGURE 3-2

EFILED
Case Number 2003CH000459
Transaction ID: 62059629
Date: May 23 2018 10:05AM
Mark Von Nida
Clerk of Circuit Court
Third Judicial Circuit, Madison County Illinois



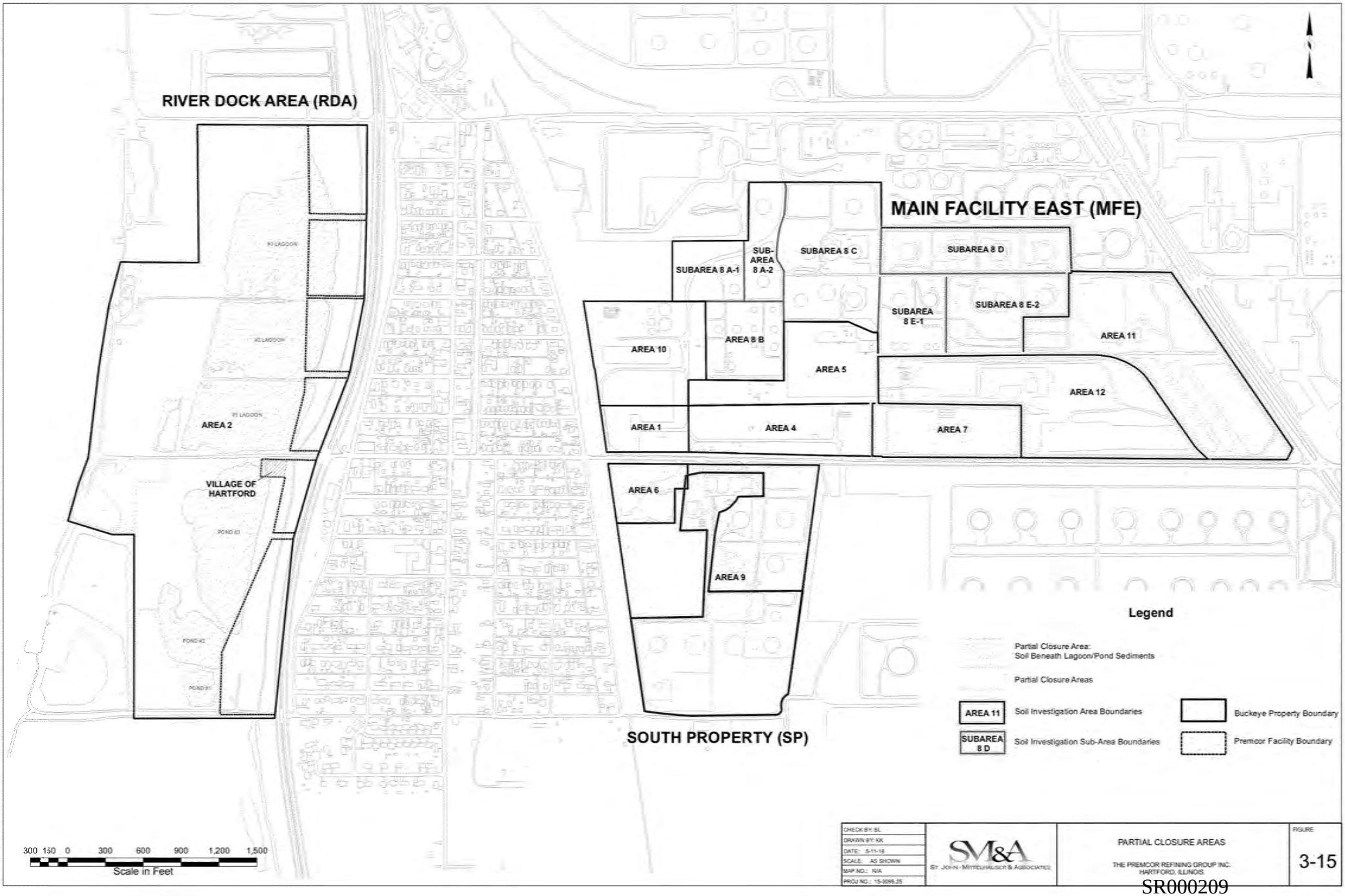
CHECK BY	MW
DRAWN BY	OS
DATE	3-16-18
SCALE	AS SHOWN
CAD NO.	03095.25.802g
PRJ NO.	15-03095.25-802

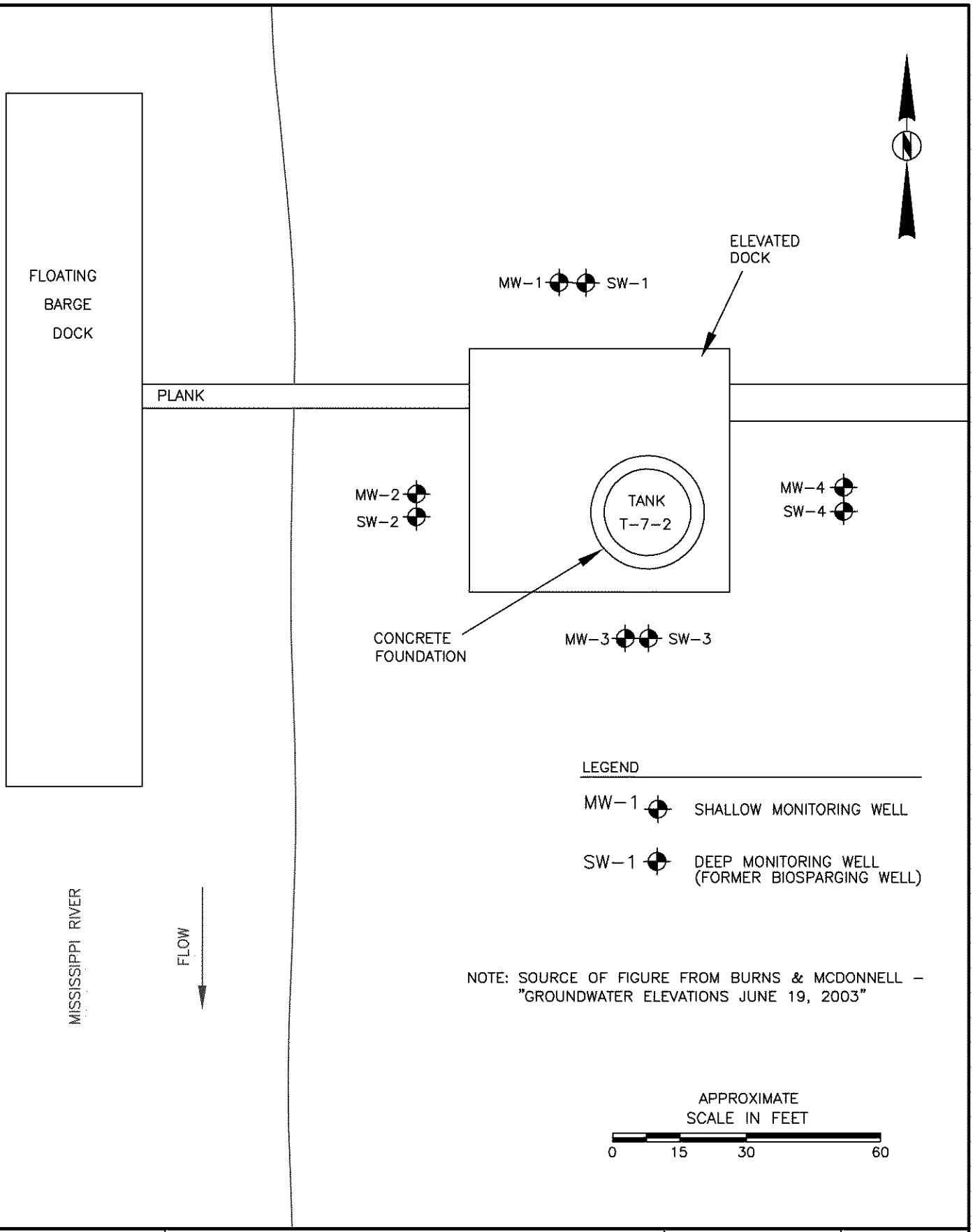
PREMCOR FACILITY LAYOUT AND SOIL INVESTIGATION AREAS

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SM&A
ST. JOHN, MITTELHAUSER & ASSOCIATES

FIGURE
3-14


RIVER DOCK AREA (RDA)
MAIN FACILITY EAST (MFE)
SUBAREA 8 A-1
SUB-AREA 8 A-2
SUBAREA 8 C
SUBAREA 8 D
SUBAREA 8 E-1
SUBAREA 8 E-2
AREA 8 B
AREA 10
AREA 5
AREA 11
AREA 12
AREA 1
AREA 4
AREA 7
AREA 2
VILLAGE OF HARTFORD
AREA 6
AREA 9
SOUTH PROPERTY (SP)
Legend
Partial Closure Area: Soil Beneath Lagoon/Pond Sediments
Partial Closure Areas
AREA 11
Soil Investigation Area Boundaries
SUBAREA 8 D
Soil Investigation Sub-Area Boundaries
Buckeye Property Boundary
Premcor Facility Boundary
300 150 0 300 600 900 1,200 1,500
Scale in Feet
CHECK BY: BL
DRAWN BY: KK
DATE: 5-11-18
SCALE: AS SHOWN
MAP NO.: N/A
PROJ NO.: 15-3095.25
SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES
PARTIAL CLOSURE AREAS
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
FIGURE
3-15



CHECK BY	MN
DRAWN BY	OS
DATE	1-15-18
SCALE	AS SHOWN
CAD NO.	03095.25.802f
PRJ NO.	15-03095.25-802

RIVER TERMINAL MONITORING WELL LOCATIONS

HARTFORD RIVER TERMINAL
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES

FIGURE
3-16

SR000210

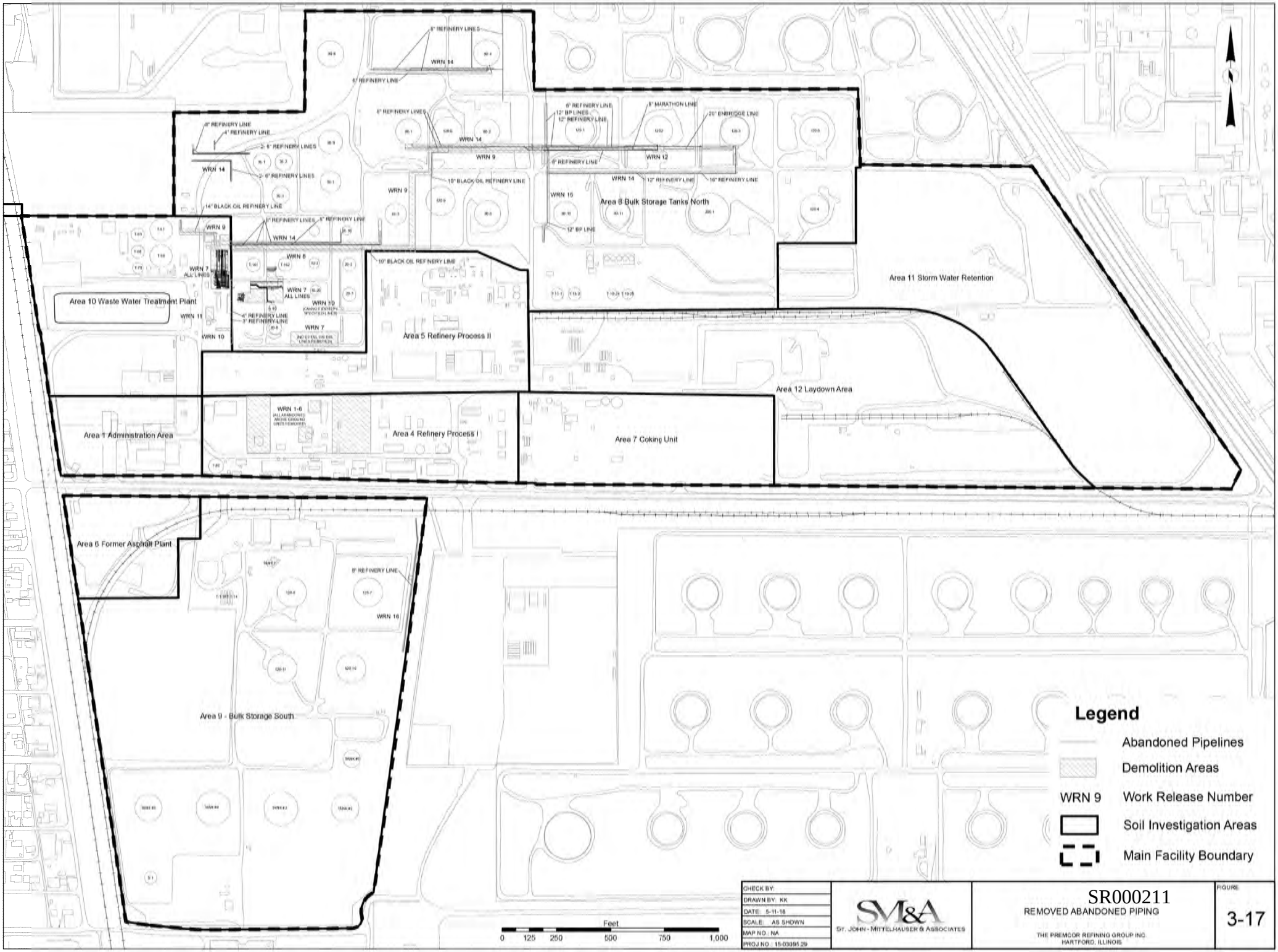
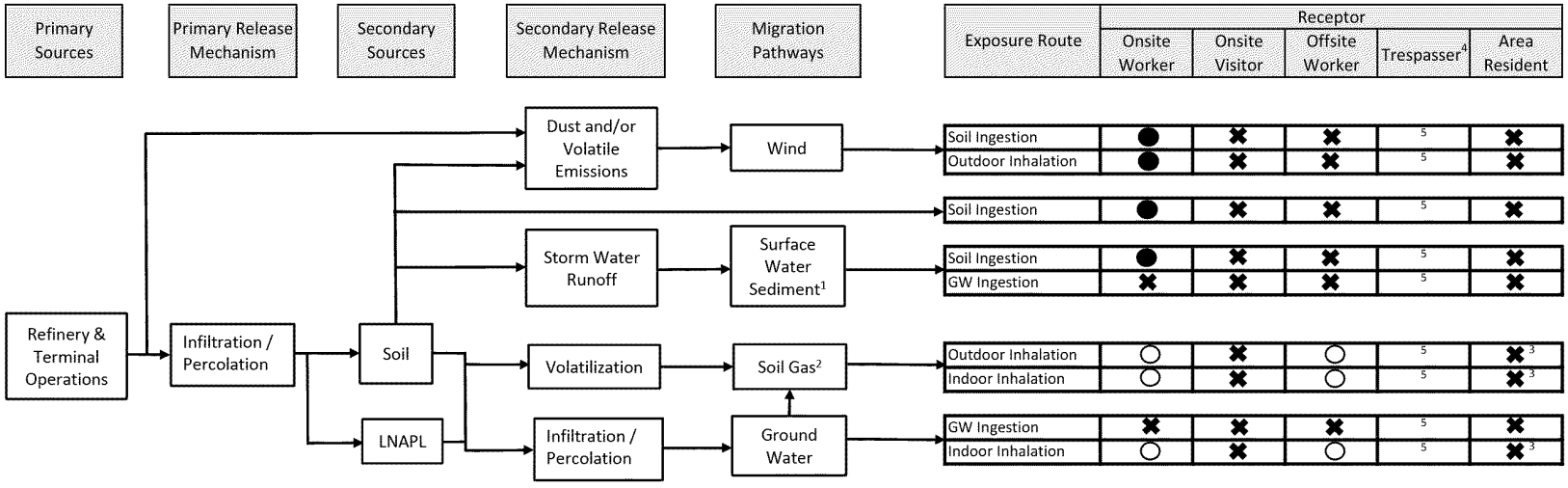

Area 1 Administration Area
Area 4 Refinery Process I
Area 5 Refinery Process II
Area 6 Former Asphalt Plant
Area 7 Coking Unit
Area 8 Bulk Storage Tanks North
Area 9 - Bulk Storage South
Area 10 Waste Water Treatment Plant
Area 11 Storm Water Retention
Area 12 Laydown Area
WRN 1-6
WRN 7
WRN 8
WRN 9
WRN 10
WRN 11
WRN 12
WRN 14
WRN 15
WRN 16
8" REFINERY LINES
6" REFINERY LINE
4" REFINERY LINE
2- 6" REFINERY LINES
14" BLACK OIL REFINERY LINE
10" BLACK OIL REFINERY LINE
12" REFINERY LINE
16" REFINERY LINE
12" BP LINES
12" BP LINE
8" MARATHON LINE
20" ENBRIDGE LINE
4" REFINERY LINE
3" REFINERY LINE
WRN 7 ALL LINES
Legend
Abandoned Pipelines
Demolition Areas
WRN 9 Work Release Number
Soil Investigation Areas
Main Facility Boundary
Feet
0 125 250 500 750 1,000
CHECK BY:
DRAWN BY: KK
DATE: 5-11-18
SCALE: AS SHOWN
MAP NO.: NA
PROJ NO.: 15-03095.29
SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES
SR000211
REMOVED ABANDONED PIPING
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
FIGURE
3-17

Figure 4-1

Conceptual Site Model for Premcor Facility

1190500002--Madison County--ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois



KEY

● Complete Pathway

✖ Incomplete Pathway

○ Pathway will be Evaluated in Accordance with the Strategic Plan

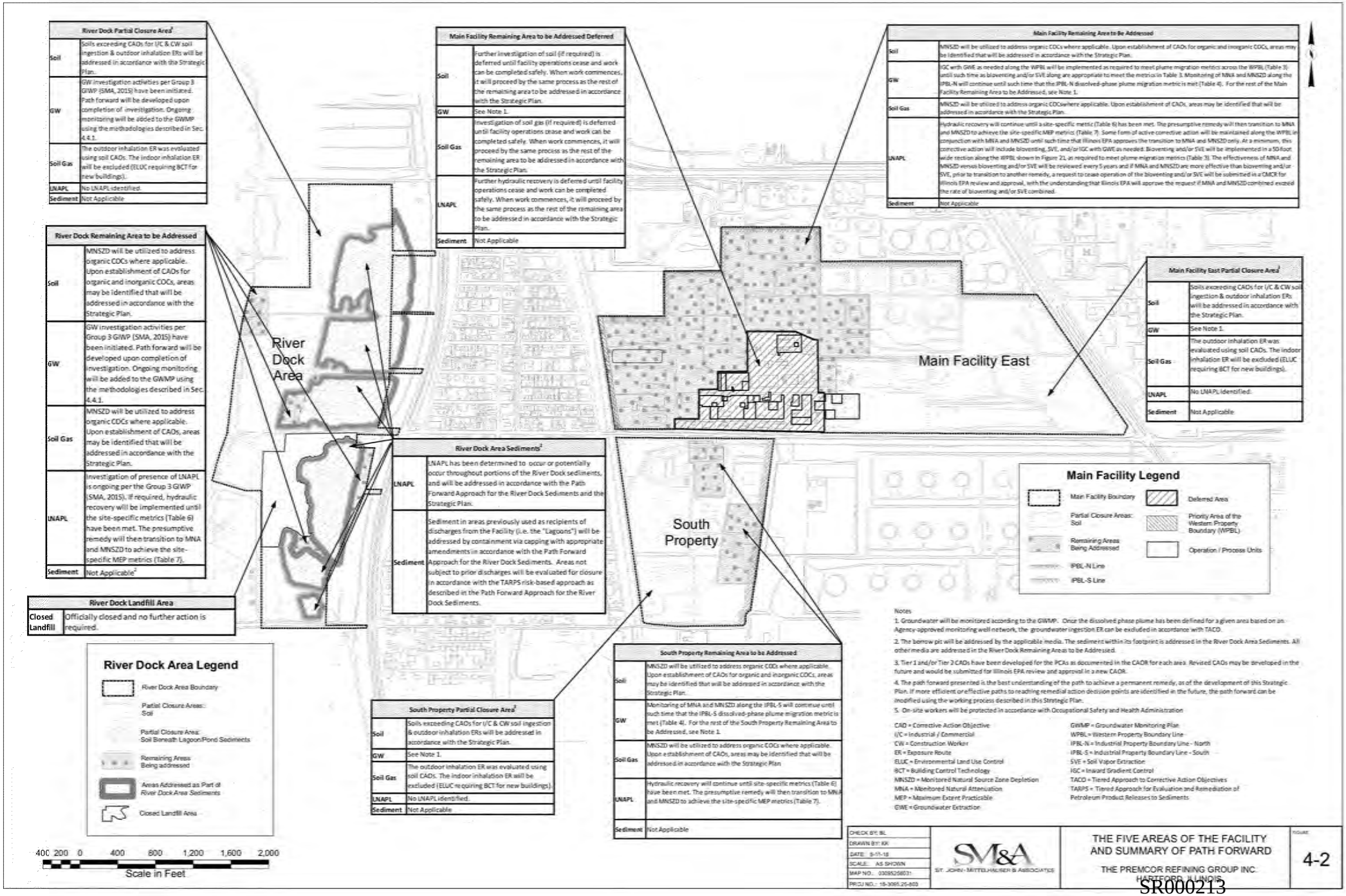
[1] For River Dock Area Sediments Ecological Exposure, refer to Sediment Path Forward CSM shown on Figure 45

[2] For Non-Partial Closure Areas

[3] Incomplete Pathway due to Operating Systems in Western Property Boundary Area

[4] Trespasser Receptor only Applies to the River Dock Area

[5] Complete but insignificant pathway addressed via access controls


River Dock Partial Closure Area[2]
Soil: Soils exceeding CAOs for I/C & CW soil ingestion & outdoor inhalation ERs will be addressed in accordance with the Strategic Plan.
GW: GW investigation activities per Group 3 GIWP (SMA, 2015) have been initiated. Path forward will be developed upon completion of investigation. Ongoing monitoring will be added to the GWMP using the methodologies described in Sec. 4.4.1.
Soil Gas: The outdoor inhalation ER was evaluated using soil CAOs. The indoor inhalation ER will be excluded (ELUC requiring BCT for new buildings).
LNAPL: No LNAPL identified.
Sediment: Not Applicable
River Dock Remaining Area to be Addressed
Soil: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs for organic and inorganic COCs, areas may be identified that will be addressed in accordance with the Strategic Plan.
GW: GW investigation activities per Group 3 GIWP (SMA, 2015) have been initiated. Path forward will be developed upon completion of investigation. Ongoing monitoring will be added to the GWMP using the methodologies described in Sec. 4.4.1.
Soil Gas: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs, areas may be identified that will be addressed in accordance with the Strategic Plan.
LNAPL: Investigation of presence of LNAPL is ongoing per the Group 3 GIWP (SMA, 2015). If required, hydraulic recovery will be implemented until the site-specific metrics (Table 6) have been met. The presumptive remedy will then transition to MNA and MNSZD to achieve the site-specific MEP metrics (Table 7).
Sediment: Not Applicable[2]
River Dock Landfill Area
Closed Landfill: Officially closed and no further action is required.
Main Facility Remaining Area to be Addressed Deferred
Soil: Further investigation of soil (if required) is deferred until facility operations cease and work can be completed safely. When work commences, it will proceed by the same process as the rest of the remaining area to be addressed in accordance with the Strategic Plan.
GW: See Note 1.
Soil Gas: Investigation of soil gas (if required) is deferred until facility operations cease and work can be completed safely. When work commences, it will proceed by the same process as the rest of the remaining area to be addressed in accordance with the Strategic Plan.
LNAPL: Further hydraulic recovery is deferred until facility operations cease and work can be completed safely. When work commences, it will proceed by the same process as the rest of the remaining area to be addressed in accordance with the Strategic Plan.
Sediment: Not Applicable
River Dock Area Sediments[2]
LNAPL: LNAPL has been determined to occur or potentially occur throughout portions of the River Dock sediments, and will be addressed in accordance with the Path Forward Approach for the River Dock Sediments and the Strategic Plan.
Sediment: Sediment in areas previously used as recipients of discharges from the Facility (i.e. the "Lagoons") will be addressed by containment via capping with appropriate amendments in accordance with the Path Forward Approach for the River Dock Sediments. Areas not subject to prior discharges will be evaluated for closure in accordance with the TARPS risk-based approach as described in the Path Forward Approach for the River Dock Sediments.
South Property Partial Closure Area[2]
Soil: Soils exceeding CAOs for I/C & CW soil ingestion & outdoor inhalation ERs will be addressed in accordance with the Strategic Plan.
GW: See Note 1.
Soil Gas: The outdoor inhalation ER was evaluated using soil CAOs. The indoor inhalation ER will be excluded (ELUC requiring BCT for new buildings)
LNAPL: No LNAPL identified.
Sediment: Not Applicable
South Property Remaining Area to be Addressed
Soil: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs for organic and inorganic COCs, areas may be identified that will be addressed in accordance with the Strategic Plan.
GW: Monitoring of MNA and MNSZD along the IPBL-S will continue until such time that the IPBL-S dissolved-phase plume migration metric is met (Table 4). For the rest of the South Property Remaining Area to be Addressed, see Note 1.
Soil Gas: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs, areas may be identified that will be addressed in accordance with the Strategic Plan
LNAPL: Hydraulic recovery will continue until site-specific metrics (Table 6) have been met. The presumptive remedy will then transition to MNA and MNSZD to achieve the site-specific MEP metrics (Table 7).
Sediment: Not Applicable
Main Facility Remaining Area to Be Addressed
Soil: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs for organic and inorganic COCs, areas may be identified that will be addressed in accordance with the Strategic Plan.
GW: IGC with GWE as needed along the WPBL will be implemented as required to meet plume migration metrics across the WPBL (Table 3) until such time as bioventing and/or SVE along are appropriate to meet the metrics in Table 3. Monitoring of MNA and MNSZD along the IPBL-N will continue until such time that the IPBL-N dissolved-phase plume migration metric is met (Table 4). For the rest of the Main Facility Remaining Area to be Addressed, see Note 1.
Soil Gas: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs, areas may be identified that will be addressed in accordance with the Strategic Plan.
LNAPL: Hydraulic recovery will continue until a site-specific metric (Table 6) has been met. The presumptive remedy will then transition to MNA and MNSZD to achieve the site-specific MEP metrics (Table 7). Some form of active corrective action will be maintained along the WPBL in conjunction with MNA and MNSZD until such time that Illinois EPA approves the transition to MNA and MNSZD only. At a minimum, this corrective action will include bioventing, SVE, and/or IGC with GWE as needed. Bioventing and/or SVE will be implemented in a 50-foot wide section along the WPBL shown in Figure 21, as required to meet plume migration metrics (Table 3). The effectiveness of MNA and MNSZD versus bioventing and/or SVE will be reviewed every 5 years and if MNA and MNSZD are more effective than bioventing and/or SVE, prior to transition to another remedy, a request to cease operation of the bioventing and/or SVE will be submitted in a CMCR for Illinois EPA review and approval, with the understanding that Illinois EPA will approve the request if MNA and MNSZD combined exceed the rate of bioventing and/or SVE combined.
Sediment: Not Applicable
Main Facility East Partial Closure Area[2]
Soil: Soils exceeding CAOs for I/C & CW soil ingestion & outdoor inhalation ERs will be addressed in accordance with the Strategic Plan.
GW: See Note 1.
Soil Gas: The outdoor inhalation ER was evaluated using soil CAOs. The indoor inhalation ER will be excluded (ELUC requiring BCT for new buildings).
LNAPL: No LNAPL identified.
Sediment: Not Applicable
River Dock Area
Main Facility East
South Property
Main Facility Legend
Main Facility Boundary
Partial Closure Areas: Soil
Remaining Areas Being Addressed
IPBL-N Line
IPBL-S Line
Deferred Area
Priority Area of the Western Property Boundary (WPBL)
Operation / Process Units
River Dock Area Legend
River Dock Area Boundary
Partial Closure Areas: Soil
Partial Closure Area: Soil Beneath Lagoon/Pond Sediments
Remaining Areas Being addressed
Areas Addressed as Part of River Dock Area Sediments
Closed Landfill Area
400 200 0 400 800 1,200 1,600 2,000
Scale in Feet
Notes
1. Groundwater will be monitored according to the GWMP. Once the dissolved phase plume has been defined for a given area based on an Agency-approved monitoring well network, the groundwater ingestion ER can be excluded in accordance with TACO.
2. The borrow pit will be addressed by the applicable media. The sediment within its footprint is addressed in the River Dock Area Sediments. All other media are addressed in the River Dock Remaining Areas to be Addressed.
3. Tier 1 and/or Tier 2 CAOs have been developed for the PCAs as documented in the CAOR for each area. Revised CAOs may be developed in the future and would be submitted for Illinois EPA review and approval in a new CAOR.
4. The path forward presented is the best understanding of the path to achieve a permanent remedy, as of the development of this Strategic Plan. If more efficient or effective paths to reaching remedial action decision points are identified in the future, the path forward can be modified using the working process described in this Strategic Plan.
5. On-site workers will be protected in accordance with Occupational Safety and Health Administration
CAO = Corrective Action Objective
I/C = Industrial / Commercial
CW = Construction Worker
ER = Exposure Route
ELUC = Environmental Land Use Control
BCT = Building Control Technology
MNSZD = Monitored Natural Source Zone Depletion
MNA = Monitored Natural Attenuation
MEP = Maximum Extent Practicable
GWE = Groundwater Extraction
GWMP = Groundwater Monitoring Plan
WPBL = Western Property Boundary Line
IPBL-N = Industrial Property Boundary Line - North
IPBL-S = Industrial Property Boundary Line - South
SVE = Soil Vapor Extraction
IGC = Inward Gradient Control
TACO = Tiered Approach to Corrective Action Objectives
TARPS = Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments
CHECK BY: BL
DRAWN BY: KK
DATE: 5-17-18
SCALE: AS SHOWN
MAP NO.: 0309525803
PROJ NO.: 18-3065.25-803
SM&A
ST. JOHN-MITTELHAUSER & ASSOCIATES
THE FIVE AREAS OF THE FACILITY AND SUMMARY OF PATH FORWARD
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
FIGURE
4-2

TABLES

TABLE 3-1
Index of Documents Submitted to Illinois EPA

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Date Submitted	Document Title	Agency Comments	Reply to Agency Comments
DOCUMENTS PRIOR TO OR OUTSIDE OF CONSENT ORDER			
4/29/2003	Current Conditions Report (Volumes 1-3)	10/07/03-IL EPA comments on Current Conditions Report faxed to Ed Dwyer (outside council for Premcor) from Jim Morgan (IL Attorney General's Office). IL EPA is in general agreement with the contents of the Current Conditions Report and therefore the next step is the development and eventual implementation of a plan to investigate/characterize the extent of soil contamination. Included in fax is IL EPA's Required Contents of a Soil Investigation Workplan.	
INTERIM MEASURES ALONG WESTERN PROPERTY BOUNDARY - INWARD GRADIENT CONTROL - Draft Partial Consent Order Section VIII.B.1.b.1.			
3/4/2005	Western Property Boundary Inward Gradient Control Plan	4/12/05 - Approved subject to specified conditions and modifications.	5/5/05 - Replacement cover pages 5/6/05 - Revised Contingency Plan (approved 7/12/05).
5/6/2005	Revised Contingency Plan for Western Property Boundary Gradient Control Plan	7/12/05-Approved subject to specified conditions and modifications.	
6/22/2005	Measures to Address Water Level Data Gaps and Anomalies	7/12/05-Approved subject to specified conditions and modifications.	7/26/05
10/7/2005	Transmittal - Memorandum: Installation of Shallow Pumping Well	12/29/05 - Approved subject to specified conditions and modifications.	
11/2/2005	Step Test and Constant-Rate Pumping Test Memorandum	12/29/05 - Approved subject to specified conditions and modifications.	
1/30/2006	Preliminary Pumping Test Results Technical Memorandum	07/17/06 - Approved subject to specified conditions and modifications.	
6/28/2006	Request to Discontinue Pumping of Production Well P-6	01/5/07 - Approved subject to specified conditions and modifications.	
5/11/2007	Response Action Plan for Inward Gradient Control Pumping Wells	10/12/07 - Approved subject to specified conditions and modifications.	
12/6/2007	Response Action Plan for Inward Gradient Control Pumping Wells - Revision 01	No Response Received or Expected.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
3/2/2011	Request Shutdown of Production Well P-6 & Reduce Pumping Rate at RPW-01	4/1/11 - Approved subject to specified conditions and modifications.	
5/2/2011	Response Action Plan for Groundwater Inward Gradient Control - Revision 02	1/13/12 - Plan cannot be approved until specified conditions and modifications are met.	4/16/12 - Premcor reply to Illinois EPA Letter Dated January 13, 2012. 5/22/2012 - Filed appeal with IL PCB.
5/11/2011	Letter Re: April 2011 (Second Quarter 2011) Groundwater Contour Maps (WPB Gradient Control)	1/13/12 - Does not concur that Premcor has inward gradient control.	4/16/12 - Premcor reply to Illinois EPA Letter Dated January 13, 2012. 5/22/2012 - Filed appeal with IL PCB.
8/19/2011	Letter Re: August 2011 Gauging Event and Groundwater Contour Maps	1/13/12 - Does not concur that Premcor has inward gradient control.	4/16/12 - Premcor reply to Illinois EPA Letter Dated January 13, 2012. 5/22/2012 - Filed appeal with IL PCB.
02/07/2012	Letter providing supplemental information in preparation for 02/14/2012 meeting with IEPA concerning their 01/13/2012 letter	No Response Received or Expected.	
4/30/2012	Letter Re: April (Q2) 2012 Groundwater Contour Maps	6/26/12 - (also replies to Premcor's 4/16/12 submittal) Approved subject to specified conditions and modifications; 3/3/13 (Reply to 7/24/12 Letter - Requirement to notify IEPA when P-1/P-2 or P-5 pumping rates changed rescinded).	7/24/12 - Reply to Illinois EPA's Letter Dated June 26, 2012.
8/14/2012	Response Action Plan for Groundwater Inward Gradient Control - Revision 3	3/13/13 - Approved subject to specified conditions and modifications.	
10/4/2012	Letter Re: July (Q3) 2012 Groundwater Contour Maps	3/13/13 - Approved subject to specified conditions and modifications.	
12/7/2012	Letter Re: Modification to WPB Inward Gradient Control System	9/24/13 - Approved subject to specified conditions and modifications.	
12/13/2012	Letter Re: October (Q4) 2012 Groundwater Contour Maps		
6/20/2013	Western Property Boundary Inward Gradient Control System - RPW-02 and RPW-03 Installation Documentation Report	9/24/13 - Approved subject to specified conditions and modifications.	
7/10/2013	Response Action Plan for Groundwater Inward Gradient Control - Revision 4	9/24/13 - Approved subject to specified conditions and modifications.	
8/16/2013	Letter Re: July (Q3) 2013 Groundwater Contour Maps		
7/14/2014	Letter Re: Production Well P-6 Repairs		
9/12/2014	Letter: Production Well P-6 Repair/Rehabilitation Gauging Event and Groundwater Contour Maps		
7/20/2016	Letter Re: Notification of Production Well P-6 and Pumping Well RPW-03 Cleaning		
8/19/2016	Letter Re: Request to Conduct Semi-Annual Gauging	2/1/17 - Approved subject to specified conditions and modifications.	
TANK 80-11 - Draft Partial Consent Oder Section VIII.B.1.d.2.			
1/27/2005	Tank 80-11 Release Area Soil and GW Investigation Work Plan	2/10/05 - Approved subject to specified conditions and modifications.	
4/8/2005	Tank 80-11 Release Area Soil and GW Investigation Report	7/15/05 and 7/26/05-Draft response letters received via email; 8/24/05 - Approved subject to conditions and modifications.	
1/27/2006	Tank 80-11 Soil Remediation Report	02/21/06 - Approved subject to specified conditions and modifications.	
11/9/2006	Work Plan: Investigation of Soil Beneath Tank 80-11	Draft Letter Received 11/29/06; Final Letter Dated 1/22/07.	
3/28/2007	Tank 80-11 Release Area - Report of Soil Investigation Beneath Tank 80-11	5/22/07 - Approved subject to specified conditions and modifications.	

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TABLE 3-1
Index of Documents Submitted to Illinois EPA

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Date Submitted	Document Title	Agency Comments	Reply to Agency Comments
SITE WIDE FREE PRODUCT RECOVERY ENHANCEMENT - Draft Partial Consent Order Section VIII.B.1.c.2.			
4/4/2005	Site Wide Free Product Investigation Work Plan (2 Volumes)	4/20/05 Phone Conversation (referenced in Clayton's correspondence on 4/22/05) 6/22/05-Approved subject to specified conditions and modifications.	4/22/05 - Clarification letter 6/13/05 - Revised figure.
1/23/2006	Site Wide Free Product Investigation Report (3 Volumes)	07/17/06 - Approved subject to specified conditions and modifications.	
6/28/2006	Proposed Monitoring Well and Core Sample Locations (Figure)	07/17/06 - Approved subject to specified conditions and modifications.	9/6/2006-Response provided basis as to why an additional well southwest of RB-52 requested by the Agency could not be installed.
9/14/2006	Work Plan for Additional Site Wide Free Product Investigation	04/04/07 - Approved subject to specified conditions and modifications.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
5/28/2009	Addendum to Site Wide Free Product Investigation Report	2/25/11 - Draft approval letter received via email; 6/28/12 - Approved subject to specified conditions and modifications.	
1/26/2010	Establishment of LNAPL Management Districts, Premcor Facility, Hartford, IL	2/25/11 - Draft approval letter received via email; 6/28/12 - Approved subject to specified conditions and modifications.	
10/26/2012	Basis of Design for Site Wide Management of Free Product	2/3/15 - Approved subject to specified conditions and modifications; 8/27/15 - Approved subject to specified conditions and modifications.	3/20/15 - Premcor's Response to Agency's Approval Letter.
10/21/2015	Request for Extension of Final Design Report for LNAPL Management Districts 1A and 1B Due Date	10/30/15 - Agency approval via email.	
12/23/2015	Request for Extension of Final Design Report for LNAPL Management Districts 1A and 1B Due Date	1/15/16 - Agency approval via email.	
2/25/2016	Final Design Report for Management of Free Product in Districts 1A and 1B - Volume 1 of 2: Final Design Documentation and Construction Work Plan		
2/25/2016	Final Design Report for Management of Free Product in Districts 1A and 1B - Volume 2 of 2: Operation and Maintenance Plan For Free Product Recovery Systems In Districts 1A and 1B		
INTERIM MEASURES ALONG WESTERN PROPERTY BOUNDARY - FREE PRODUCT RECOVERY ENHANCEMENT SVE SYSTEM- Draft Partial Consent Order Section VIII.B.1.b.2.			
5/29/2003	FPH Recovery Enhancement Work Plan	9/7/04 8:50 AM email including attachment dated 8/5/03 providing approval subject to specified conditions and recommendations.	
8/29/2003	Free Phase Hydrocarbon Recovery Enhancement Evaluation (Section 6 includes results of SVE pilot test) - report submitted by Premcor	9/7/04 10:54 email includes attachments (one undated & second dated 9/2/04) - document not acceptable.	
9/17/2004	Field Schedule for FPH Recovery Enhancement Work Plan	10/12/04 - Approved subject to specified conditions and recommendations (document conveyed via email).	
6/3/2005	Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report (Appendix B contains results of MPE Pilot Test)	**8/30/05** - Received comments from Illinois EPA via email; **9/29/05** - SVE portion of Plan approved subject to specified conditions and modifications. **4/15/08** - remainder of plan approved with specified conditions and modifications based on the subsequent submittal of the September 18, 2006 Addendum, the September 27, 2006 Low-Flow Pilot Testing procedures, and the December 14, 2007 Extended Low-Flow Dual Phase Extraction Pilot Test Report.	11/15/05 Provided draft response to Agency's 8/30/05 comments; 2/7/06 Agency commented on draft correspondence; 3/24/06 Submitted final response to Agency's 8/30/05 comments; 7/17/06 Agency approved response.
7/14/2005	Soil Vapor Monitoring - July 2005 Quarterly Monitoring Report	No Response Received or Expected.	
7/28/2005	Plan to Evaluate Dissolved BETX at RMW-35A	10/19/05 - Approved subject to specified conditions and modifications.	
10/14/2005	Vapor Monitoring Ports - Quarterly Monitoring Report October 2005	No Response Received or Expected.	
12/16/2005	Final Design Report - IM Western Property Boundary Free Product Enhancement Plan.	02/08/06 - Approved subject to specified conditions and modifications.	
1/13/2006	Vapor Monitoring Ports - Quarterly Monitoring Report January 2006	No Response Received or Expected.	
4/7/2006	Vapor Monitoring Ports - Quarterly Monitoring Report - March 2006	No Response Received or Expected.	
7/6/2006	Vapor Monitoring Ports Quarterly Monitoring Report	No Response Received or Expected.	
12/4/2006	SVE System Construction Completion Report	1/25/07 - Approved subject to specified conditions and modifications.	
2/5/2007	RMW-35A Area Investigation Report and Remedial Design Plan	5/24/07 - Received Memo via email recommending approval of submittal; 6/7/07 - Approved subject to specified conditions and modifications.	
11/16/2007	RMW-35A Area SVE Expansion Construction Completion Report	4/18/08 - Approved subject to specified conditions and modifications.	
3/3/2008	Request to Modify SVE Effectiveness Monitoring Plan	4/10/08 - Draft response received via email; 4/30/08 - Approved subject to specified conditions and modifications.	
8/8/2008	Request to Combine Quarterly Progress Report and SVE Effectiveness Quarterly Monitoring Report	10/7/08 - Approved subject to specified conditions and modifications.	
11/12/2008	Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan (Revision No. 1)	12/4/08 - Draft approval letter received via email; 2/9/09 - approved subject to specified conditions and modifications.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	

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TABLE 3-1
Index of Documents Submitted to Illinois EPA

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Date Submitted	Document Title	Agency Comments	Reply to Agency Comments
3/26/2009	Request to Reduce Frequency of SVE Effectiveness Monitoring	7/02/09 - Approved subject to specified conditions and modifications.	
5/8/2009	Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan (Revision No. 2)	7/02/09 - Approved subject to specified conditions and modifications.	
10/6/2009	Request to Remove RVMP-10 Well Nest from the SVE Effectiveness O&M Plan	4/13/10 - Verbal approval (phone conversation between M.Nienkerk & J.Moore).	
12/9/2009	Request to Modify the SVE Effectiveness O&M Plan	3/3/10 - Approved subject to specified conditions and modifications.	
5/13/2010	Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan Rev. 03	11/4/10 - Approved subject to specified conditions and modifications.	
10/8/2012	Letter Re: Request to Modify SVE & LFDPE O&M Plans	12/21/12 - Reduces SVE/LFDPE Effectiveness Monitoring from quarterly to annual. Also requires daily, weekly, & monthly systems monitoring already required by the systems O&M plans.	
11/17/2017	Notification: RMW-35A SVE Area Shutdown	No Response Received or Expected.	
INTERIM MEASURES ALONG WESTERN PROPERTY BOUNDARY - FREE PRODUCT RECOVERY ENHANCEMENT - LFDPE SYSTEM - Draft Partial Consent Order Section VIII.B.1.b.3.			
6/3/2005	Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report (Appendix B contains results of MPE Pilot Test)	**8/30/05** - Received comments from Illinois EPA via email; **9/29/05** - SVE portion of Plan approved subject to specified conditions and modifications. **4/15/08** - remainder of plan approved with specified conditions and modifications based on the subsequent submittal of the September 18, 2006 Addendum, the September 27, 2006 Low-Flow Pilot Testing procedures, and the December 14, 2007 Extended Low-Flow Dual Phase Extraction Pilot Test Report.	11/15/05 Provided draft response to Agency's 8/30/05 comments; 2/7/06 Agency commented on draft correspondence; 3/24/06 Submitted final response to Agency's 8/30/05 comments; 7/17/06 Agency approved response.
10/10/2005	Transmittal of Technical Memorandum - LNAPL Characterization and Recovery Pilot Testing Plan, Premcor - Hartford Site	02/02/06 - Approved subject to specified conditions and modifications.	
9/18/2006	Addendum to Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report	4/8/08 - Draft response received; 4/15/08 - approved subject to specified conditions and modifications.	4/23/08 - Correspondence submitted to clarify conditions.
9/27/2006	Low-Flow DPE Extended Pilot Testing Memorandum	4/8/08 - Draft response received; 4/15/08 - approved subject to specified conditions and modifications.	
12/14/2007	Extended Low-Flow Dual Phase Extraction Pilot Test Report	4/8/08 - Draft response received; 4/15/08 - approved subject to specified conditions and modifications.	
6/13/2008	Western Property Boundary Final Design Documentation and Construction Work Plan Addendum	3/11/09 - Draft approval letter received via email. 4/13/09 - Final approval letter - approved subject to specified conditions and modifications	3/27/09 - Provided redline strikeout version of approval letter
6/13/2008	Western Property Boundary Free Product Recovery Enhancement Low-Flow Dual Phase Extraction Operation and Maintenance Plan	10/27/08 - Draft list of conditions received via email; 3/11/09 - Draft approval letter received via email. 4/13/09 - Final approval letter - approved subject to specified conditions and modifications.	11/4/2008 - Sent email and red-line strikeout version of conditions; 3/27/09 - Provided redline strikeout version of approval letter.
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
5/26/2011	Construction Completion Report Western Property Boundary Low-Flow Dual Phase Extraction System Premcor Main Facility	6/8/12 - Approved subject to specified conditions and modifications.	
8/4/2011	Letter Re: Western Property Boundary Low-Flow Dual Phase Extraction System Construction Completion Report Revisions (revised Figure AB-6)	6/8/12 - Approved subject to specified conditions and modifications.	
10/8/2012	Letter Re: Request to Modify SVE & LFDPE O&M Plans	12/21/12 - Reduces SVE/LFDPE Effectiveness Monitoring from quarterly to annual. Also requires daily, weekly, & monthly systems monitoring already required by the systems O&M plans.	
11/24/2014	Letter Re: LFDPE System – Changing Mode of Operation	2/18/15 - Approved subject to specified conditions and modifications.	
8/10/2016	Letter Re: LNAPL Transmissivity Tests		
SITE WIDE INWARD GRADIENT CONTROL - Draft Partial Consent Order Section VIII.B.1.c.1.			
7/1/2005	Work Plan Site Wide Inward Gradient Control	12/29/05 Approved in concept subject to specified conditions and modifications; an Addendum to the Work Plan is due May 5, 2006.	Addendum submitted May 5, 2006 and approved 1/8/07.
9/16/2005	Transmittal - Memorandum: Additional Deep Nested Monitoring Wells	11/15/05 - Approved subject to specified conditions and modifications.	
5/5/2006	Addendum to Site Wide Inward Gradient Control Work Plan	01/8/07 - Approved subject to specified conditions and modifications.	
1/17/2007	Request to Conduct Quarterly Gauging and Reporting	1/31/07 - Approved verbally; 2/15/07 - received written approval letter.	
2/27/2007	Request to Modify Groundwater Monitoring Program	7/30/07- Approved subject to specified conditions and modifications.	
3/9/2007	Site Wide Inward Gradient Control Basis of Design Report (Document Withdrawn)	5/28/2009 - Accepts 4/9/2009 & 5/7/2009 requests to withdraw subject to specified conditions & modifications.	
6/1/2007	Request to Not Submit 0.10-Foot Groundwater Contour Map	7/30/07- Approved subject to specified conditions and modifications.	
3/27/2008	Request to Modify Groundwater Monitoring Program	6/27/08 - Approved via email; 7/8/08 - Final approval letter received.	
8/8/2008	Request to Combine Quarterly Progress Report and SVE Effectiveness Quarterly Monitoring Report	10/7/08 - Approved subject to specified conditions and modifications.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	

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TABLE 3-1
Index of Documents Submitted to Illinois EPA

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Date Submitted	Document Title	Agency Comments	Reply to Agency Comments
4/9/2009	Withdrawal of the Site Wide Inward Gradient Control Basis of Design Report	4/9/09 - Agency email acknowledgment of receipt of Premcor's April 9, 2009 letter withdrawing report; 5/28/09 - Approved subject to specified conditions and modifications.	
5/7/2009	Addendum to April 9, 2009 Letter Withdrawing the March 9, 2007 Site Wide Inward Gradient Control Basis of Design Report	5/28/09 - Approved subject to specified conditions and modifications.	
5/28/2009	Groundwater Monitoring Plan (Revision No. 1)	9/17/09 - Approved subject to specified conditions and modifications.	
10/2/2009	Confirmation of 9/24/09 and 9/30/09 telephone conversations with Paula Stine regarding two approval letters dated 9/17/09 concerning the 5/28/09 Groundwater Monitoring Plan and 7/2/09 Notification of RB-37 Abandonment	10/6/09 - Telephone Conversation Confirmed.	
10/15/2009	New Site Wide Inward Gradient Control Basis of Design Report - Request for a Revised Submittal Date	12/28/09 - Approved subject to specified conditions and modifications.	
11/24/2009	Request to Conduct Semi-Annual Gauging	12/18/09 - Email response - request was denied.	
5/4/2010	Request to Reconsider Semi-Annual Gauging	5/25/10 - Approved subject to specified conditions and modifications.	
6/22/2010	New SWIGC Basis of Design Report Request for Time Extension	8/25/10 - Approved subject to specified conditions and modifications.	
6/29/2010	Request to go to Quarterly Status Reports and Annual Comprehensive Reports.	11/17/10 - Request Approved.	
7/16/2010	Request to Modify Groundwater Monitoring Program	9/8/10 - Approved subject to specified conditions and modifications.	
1/21/2011	Request to Modify Groundwater Monitoring Plan and Abandon Wells	3/14/11 - Approved subject to specified conditions and modifications.	
5/11/2011	GW Monitoring Plan - Revision No. 02	1/13/12 - approved; Plan incorporates changes approved by Illinois EPA in their 3/14/11 letter approving the 1/21/11 Request to Modify the Plan.	
1/13/2012	Letter Re: Request to Modify GW Monitoring Plan	4/27/12 - Request to decrease number of analytical parameters – denied; Request to decrease number of monitoring wells – approved with modifications; Request to conduct HydraSleeve pilot test – approved.	6/4/12 - Reply to Condition 3 of Illinois EPA's April 27, 2012 Letter.
3/21/2012	Letter Re: Supplemental Information (HydraSleeve pilot test) to January 13, 2012 Request to Modify Groundwater Monitoring Plan	4/27/12 - Approved subject to specified conditions and modifications.	
10/4/2012	Letter Re: Request to Modify Groundwater Monitoring Plan	3/13/13 - Approved subject to specified conditions and modifications.	
5/31/2013	Revision No. 3 of the Groundwater Monitoring Plan	9/24/13 - Approved subject to specified conditions and modifications.	
6/13/2013	Revision No. 3 of the Groundwater Monitoring Plan - Appendix A Sampling and Analyses Plan: Attachment A Standard Operating Procedures Errata	9/24/13 - Approved subject to specified conditions and modifications.	
11/5/2013	Request to Modify Groundwater Monitoring Plan	2/20/14 - Rejected pending additional information.	
12/9/2014	Letter Re: Request to Abandon Monitoring Well RB-26 and Remove from the Groundwater Monitoring Plan	2/19/15 - Approved subject to specified conditions and modifications.	
12/16/2014	Letter Re: Supplemental Information to Support November 5, 2013 Request to Modify Groundwater Monitoring Plan	3/12/15 - Rejected pending additional information.	
3/7/2016	Alternate Source Demonstration Groundwater Impact at RMW-43A	4/30/18 - Approved	
SITE WIDE SOIL INVESTIGATION - Draft Partial Consent Order Section VIII.B.1.c.3.			
6/30/2006	Site Wide Soil Investigation Work Plan	Draft Letter Received August 16, 2006; Final Letter Dated Sept. 19, 2006.	
1/17/2007	Group 1 Soil Investigation Work Plan	5/30/07 - Draft response letter received via email; 7/30/07 -approved subject to specified conditions and modifications.	
5/22/2008	Group 1 Soil Investigation Report	12/15/08 - Draft approval letter received; 2/24/10 - Approved subject to specified conditions and modifications.	3/10/09 - Provided redline strikeout version of approval letter.
6/30/2008	Group 2 Soil Investigation Work Plan	10/30/09 - Approved subject to specified conditions and modifications.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
10/20/2009	LNAPL and Groundwater Status for Site Wide Soil Investigation Group 1 - South of Hawthorne Street	2/24/10 - Acknowledgment contained in Condition 7C of 2/28/10 letter approving Group 1 Soil Investigation Report.	
4/5/2010	Site Wide Soil Group 1 Additional Step-Out Locations	4/6/10 - Email acknowledgment.	
8/5/2010	Group 3 Soil Investigation Work Plan	11/10/10 - Verbal Approval Received, 1/31/11 - Approved subject to specified conditions and modifications.	
10/22/2010	Group 1 Soil Investigation Addendum and Summary Report	2/29/12 - Approved subject to specified conditions and modifications.	
2/28/2011	Preliminary Group 2 Soil Investigation Data Evaluation Memorandum	07/22/2011 - Email received from Takako Halteman (IEPA) providing comment on the memorandum & requiring submittal of the Group 2 Soil Investigation Report by 11/01/2011.	
10/28/2011	Group 2 Soil Investigation Report	5/22/13 - Approved subject to specified conditions and modifications. Requires supplemental soil investigation. Supplemental Soil Investigation Work Plan due by 8/20/2013.	

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TABLE 3-1
Index of Documents Submitted to Illinois EPA

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Date Submitted	Document Title	Agency Comments	Reply to Agency Comments
9/14/2012	Group 3 Soil Investigation Report	10/14 – Draft Approval Letter; 6/30/15 - Approved subject to specified conditions and modifications.	3/9/15 - Premcor's Response to Agency's Draft Approval Letter; 8/28/15 Premcor's Response to Approval of Group 3 Soil Investigation Report.
3/20/2013	Group 4 Soil Investigation Work Plan	9/23/13 - Approved subject to specified conditions and modifications.	
6/27/2013	Group 3 Soil Investigation Errata for Section 5.1.3 and Appendices E	10/14 – Draft Approval Letter; 6/30/15 - Approved subject to specified conditions and modifications.	3/9/15 - Premcor's Response to Agency's Draft Approval Letter
8/16/2013	Group 2 Supplemental Soil Investigation Work Plan	11/7/14 - Approved subject to specified conditions and modifications.	
5/6/2014	Group 2 Supplemental Soil Investigation Work Plan: Revised Table 2.1	11/7/14 - Approved subject to specified conditions and modifications.	
6/27/2014	Response to June 13, 2014 Illinois EPA Email requesting additional information for the Group 3 Area .	10/14 – Draft Approval Letter; 6/30/15 - Approved subject to specified conditions and modifications.	3/9/15 - Premcor's Response to Agency's Draft Approval Letter
7/25/2014	Group 4 Soil Investigation Report	8/6/15 - Draft Approval Letter; 11/24/15 - Approved subject to specified conditions and modifications.	9/2/15 - Premcor's Response to Agency's Draft Approval Letter; 3/22/16 - Premcor's Response to Agency's Approval Letter
8/27/2014	Additional Information Requested by Illinois EPA in a July 17, 2014 email regarding the Group 2 Supplemental Soil Investigation WP: TPH Evaluation		
9/24/2014	Response to September 10, 2014 Email regarding request for additional information on the TPH Evaluation for Group 2		
5/21/2015	Group 2 Supplemental Soil Investigation Report	8/28/15 - Draft Approval Letter; 11/24/15 - Approved subject to specified conditions and modifications.	9/15/15 - Premcor's Response to Agency's Draft Approval Letter
9/2/2015	Group 4 Soil Investigation Report Errata for Table 5-5 and Table in Appendix I	11/24/15 - Approved subject to specified conditions and modifications.	3/22/16 - Premcor's Response to Agency's Approval Letter
10/29/2015	Group 3 Groundwater Investigation Work Plan	8/1/17 – Approved subject to specified conditions and modifications.	
5/10/2016	Group 1 Soil Investigation Report Errata for Table D-1 in Appendix D - Soil Analytical for Area 9		
5/10/2016	Group 1 Soil Investigation Addendum and Summary Report Errata for Table 4-1		
5/10/2016	Group 2 Soil Investigation Errata for Section 5.3.2, Table 4-1, Figure 5-60		
5/10/2016	Group 2 Supplemental Soil Investigation Errata for Table 2-1A		
5/10/2016	Group 3 Soil Investigation Errata for Table 4-1		
5/10/2016	Group 4 Soil Investigation Errata for Section 5.3.2, Table 4-1, Figures 5-31 and 5-51		

TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
DS-01	DS01	02/02/2005	427.97	431.16	406.37 - 396.87	Main Shallow	None							
DS-02	DS02	02/02/2005	428.11	431.21	406.26 - 396.76	Main Shallow	None							
DS-03	DS03	02/04/2005	428.36	430.56	405.48 - 396.75	Main Shallow	None							
DS-04	DS04	02/03/2005	428.24	431.62	406.74 - 397.24	Main Shallow	None							
GB-01	GB01	01/22/1993	429.21	431.59	399.71 - 389.71	Main Shallow	Fluid Gauging	X	X					
GB-06	GB06	08/05/1993	428.08	430.55	403.08 - 388.08	Main Shallow	Fluid Gauging	X	X					
LP-04	LP04	02/03/1993	430.32	432.61	405.32 - 390.32	Main Shallow	Fluid Gauging	X						
MW-01	MW01	10/10/1995	419.58	420.51	410.08 - 395.08	Main Shallow	Fluid Gauging	X	X					
MW-02		10/12/1995	418.93	419.23	410.51 - 395.51	Main Shallow	Fluid Gauging	X						
MW-03		10/13/1995	420.47	421.45	411.28 - 396.28	Main Shallow	Fluid Gauging	X						
MW-04	MW04	10/11/1995	420.52	421.45	411.22 - 396.22	Main Shallow	Fluid Gauging	X	X					
P-1		12/16/1966	429.62	430.62	345.62 - 325.62	Main Basal	WRB Production Well							
P-2		04/11/1966	429.92	430.71	336.42 - 316.42	Main Basal	WRB Production Well							
P-5		12/16/1969	428.58	429.33	338.58 - 318.58	Main Basal	WRB Production Well							
P-6		02/26/1973	429.88	424.61	340.88 - 315.88	Main Basal	Gradient Control							
P6N		02/26/1973	431.82	432.33		Main Basal	None							
P-7		08/30/1988	429.74		356.24 - 326.24	Main Basal	Inactive Production Well							
RB-01	RB01	07/06/1979	427.74	430.12	412.72 - 392.72	Main Shallow	Fluid Gauging	X						
RB-08	RB08	07/12/1979	429.99	433.48	400.99 - 380.99	EPA/Main	Fluid Gauging	X						
RB-08P	RB8P	01/01/1980	431.03	432.48	402.03 - 377.03	EPA/Main	Fluid Gauging	X						
RB-10	RB10	10/21/1994	428.48	430.11	403.48 - 383.48	EPA/Main	Fluid Gauging	X						
RB-13	RB13	07/19/1979	429.27	430.85		EPA/Main	Fluid Gauging	X						
RB-22	RB22	08/08/1979	429.29	431.15	410.29 - 385.29	Main Shallow	Fluid Gauging	X						
RB-25	RB25	11/29/1979	428.66	432.22	398.36 - 383.36	EPA/Main	Fluid Gauging	X	X					
RB-29	RB29		429.86	431.97		North Olive	Fluid Gauging	X						
RB-30	RB30		429.79	431.96		Main Shallow	Fluid Gauging	X						
RB-35	RB35		427.18	429.52		EPA/Main	Fluid Gauging	X				X		
RB-38	RB38	02/09/1995	430.39	433.69	395.39 - 380.39	Main Shallow	Fluid Gauging	X	X					
RB-40	RB40	08/30/1995	431.74	433.52	402.24 - 387.24	Main Shallow	Fluid Gauging	X	X					
RB-41	RB41	08/31/1995	431.63	433.27	401.63 - 386.63	Main Shallow	Fluid Gauging	X	X					
RB-42	RB42	09/01/1995	426.57	428.46	399.57 - 384.57	Main Shallow	Fluid Gauging	X	X					
RB-43	RB43	09/07/1995	426.75	427.99	406.75 - 391.75	Main Shallow	Fluid Gauging	X	X					
RB-44	RB44	09/08/1995	430.95	432.96	407.95 - 392.95	Main Shallow	Fluid Gauging	X	X					
RB-45	RB45	09/07/1995	430.23	431.95	400.23 - 385.23	Main Shallow	Fluid Gauging	X	X					
RB-46	RB46	09/19/1995	428.67	430.68	403.67 - 388.67	Main Shallow	Fluid Gauging	X	X					
RB-47	RB47	09/11/1995	429.28	431.16	404.28 - 389.28	Main Shallow	Fluid Gauging	X						
RB-48	RB48	09/19/1995	429.48	431.37	404.48 - 389.48	Main Shallow	Fluid Gauging	X	X		X			
RB-49	RB49	09/14/1995	427.54	429.36	400.54 - 385.54	A Clay	Fluid Gauging	X	X					
RB-50	RB50	09/14/1995	429.52	431.72	419.52 - 384.52	A Clay	Fluid Gauging	X	X					
RB-51	RB51	09/13/1995	429.74	431.67	404.74 - 389.74	Main Shallow	Fluid Gauging	X	X					
RB-52	RB52	09/12/1995	430.66	432.06	408.66 - 388.66	Main Shallow	Fluid Gauging	X	X					
RB-53	RB53	09/05/1995	431.76	433.33	409.76 - 389.76	EPA/Main	Fluid Gauging	X						
RB-55	RB55	08/31/1995	432.33	433.90	412.33 - 392.33	EPA	Fluid Gauging	X					X	

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RB-56	RB56	09/18/1995	430.08	431.98	406.08 - 386.08	EPA/Main	Fluid Gauging	X						E
RDPE-01		07/15/2009	431.18	430.78	401.18 - 389.18	EPA	LFDPE							X
RDPE-01CW		03/31/2010	431.18	430.80	399.68 - 390.28	EPA	LFDPE	X						X
RDPE-02		07/13/2009	431.24	430.78	401.24 - 386.24	Main Shallow	LFDPE							X
RDPE-02CW		03/30/2010	431.24	430.94	399.84 - 386.44	Main Shallow	LFDPE	X						X
RDPE-03		07/14/2009	431.18	430.63	401.18 - 386.18	Main Shallow	LFDPE							X
RDPE-03CW		03/11/2010	431.18	430.75	400.58 - 385.88	Main Shallow	LFDPE	X						X
RDPE-04		07/23/2009	430.52	430.44	399.52 - 384.52	Main Shallow	LFDPE							X
RDPE-04CW		03/10/2010	430.52	430.39	400.22 - 385.52	Main Shallow	LFDPE	X						X
RDPE-05		07/24/2009	430.58	430.18	399.58 - 384.58	Main Shallow	LFDPE							X
RDPE-05CW		04/01/2010	430.58	430.24	399.28 - 384.68	Main Shallow	LFDPE	X						X
RDPE-06		07/31/2009	430.27	429.79	399.87 - 388.77	EPA	LFDPE							X
RDPE-06CW		03/08/2010	430.27	429.97	399.17 - 389.77	EPA	LFDPE	X						X
RDPE-07		07/28/2009	430.18	429.95	399.68 - 384.68	EPA/Main	LFDPE							X
RDPE-07CW		03/08/2010	430.18	429.92	399.08 - 384.28	EPA/Main	LFDPE	X						X
RDPE-08		07/29/2009	430.09	429.87	401.59 - 389.59	EPA	LFDPE							X
RDPE-08CW		03/09/2010	430.09	429.81	399.19 - 390.49	EPA	LFDPE	X						X
RDPE-09		07/30/2009	430.13	429.67	400.13 - 389.13	EPA	LFDPE							X
RDPE-09CW		03/05/2010	430.13	429.70	399.43 - 389.93	EPA	LFDPE	X						X
RDPE-10		07/21/2009	430.10	429.66	400.20 - 389.20	EPA	LFDPE							X
RDPE-10CW		03/04/2010	430.10	429.66	399.70 - 390.50	EPA	LFDPE	X						X
RDPE-11		07/22/2009	430.14	430.02	400.24 - 389.24	EPA	LFDPE							X
RDPE-11CW		03/03/2010	430.14	429.91	399.74 - 390.54	EPA	LFDPE	X						X
RDPE-12		07/20/2009	429.52	429.04	400.62 - 389.62	EPA	LFDPE							X
RDPE-12CW		03/09/2010	429.52	429.11	400.02 - 390.82	EPA	LFDPE	X						X
RDPE-13		07/01/2009	430.26	429.55	400.46 - 390.46	EPA	LFDPE							X
RDPE-13CW		03/02/2010	430.26	429.63	399.56 - 391.36	EPA	LFDPE	X						X
RDPE-14		07/16/2009	429.87	429.41	399.97 - 389.97	EPA	LFDPE							X
RDPE-14CW		03/02/2010	429.87	429.47	399.87 - 391.77	EPA	LFDPE	X						X
RMP-05A		03/28/2006	431.54	431.13	425.54 - 424.64	A Clay	SVE Eff. Mon.			X				
RMP-05B		03/28/2006	431.54	431.01	420.04 - 413.24	North Olive	SVE Eff. Mon.	X		X				
RMP-05C		03/24/2006	431.53	431.32	400.93 - 390.23	EPA	SVE Eff. Mon.	X		X				
RMP-05D		03/23/2006	431.56	431.33	388.06 - 378.06	Main Below D Clay	Fluid Gauging	X						
RMP-06A		03/22/2006	430.48	430.23	424.48 - 423.60	A Clay	SVE Eff. Mon.			X				
RMP-06B		03/22/2006	430.48	430.10	419.98 - 413.10	North Olive	SVE Eff. Mon.			X				
RMP-06C		03/21/2006	430.59	429.96	398.29 - 393.79	EPA	SVE Eff. Mon.			X				
RMP-06D		03/17/2006	430.56	430.36	386.06 - 376.56	Main Below D Clay	None							
RMP-07A		03/31/2006	430.96	430.60	425.16 - 424.06	A Clay	SVE Eff. Mon.			X				
RMP-07B		03/31/2006	430.96	430.66	418.96 - 413.06	North Olive	SVE Eff. Mon.	X		X				
RMP-07C		03/30/2006	430.90	430.58	402.65 - 390.76	EPA	SVE Eff. Mon.	X		X				
RMP-07D		03/29/2006	430.88	430.65	387.98 - 378.48	Main Below D Clay	Fluid Gauging	X						
RMP-08A		04/06/2006	430.22	433.59	424.22 - 423.22	A Clay	SVE Eff. Mon.			X				
RMP-08B		04/06/2006	430.22	433.57	418.72 - 413.82	North Olive	SVE Eff. Mon.	X		X				

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMP-08C		04/05/2006	430.23	433.52	401.33 - 391.83	EPA	SVE Eff. Mon.			X				
RMP-08D		04/03/2006	430.10	433.61	387.43 - 378.00	Main Below D Clay	None							
RMP-09A		04/19/2006	431.03	434.25	425.15 - 424.15	A Clay	SVE Eff. Mon.			X				
RMP-09B		04/19/2006	431.03	434.13	419.07 - 413.15	North Olive	SVE Eff. Mon.	X		X				
RMP-09C		04/18/2006	431.11	434.15	400.11 - 385.03	Main Shallow	SVE Eff. Mon.	X		X				
RMP-10A		04/25/2006	431.00	430.77	425.00 - 424.00	A Clay	SVE Eff. Mon.			X				
RMP-10B		04/25/2006	431.00	430.78	419.00 - 413.10	North Olive	SVE Eff. Mon.	X		X				
RMP-10C		04/24/2006	430.98	430.84	401.58 - 386.48	Main Shallow	SVE Eff. Mon.	X		X				
RMP-11A		04/13/2006	430.23	429.88	424.23 - 423.23	A Clay	SVE Eff. Mon.			X				
RMP-11B		04/13/2006	430.23	429.90	418.73 - 411.56	North Olive	SVE Eff. Mon.	X		X				
RMP-11C		04/12/2006	430.32	429.94	401.32 - 386.71	Main Shallow	SVE Eff. Mon.	X		X				
RMP-12A		04/21/2006	430.76	430.57	424.88 - 423.88	A Clay	SVE Eff. Mon.			X				
RMP-12B		04/21/2006	430.76	430.56	419.26 - 412.23	North Olive	SVE Eff. Mon.	X		X				
RMP-12C		04/21/2006	430.73	430.38	408.46 - 398.99	Main Silt	SVE Eff. Mon.	X		X				
RMP-12D		04/20/2006	430.68	430.47	396.68 - 382.16	Main Shallow	SVE Eff. Mon.	X		X				
RMP-13A		04/27/2006	430.49	431.37	422.49 - 421.49	A Clay	SVE Eff. Mon.			X				
RMP-13B		04/27/2006	430.49	431.38	414.49 - 412.33	Main Silt	SVE Eff. Mon.	X		X				
RMP-13C		04/26/2006	430.48	431.42	405.48 - 390.98	Main Shallow	SVE Eff. Mon.	X		X				
RMP-14A		05/05/2006	430.76	430.38	420.76 - 419.76	A Clay	SVE Eff. Mon.			X				
RMP-14B		05/05/2006	430.76	430.38	413.76 - 411.76	Main Silt	SVE Eff. Mon.	X		X				
RMP-14C		05/04/2006	430.94	430.71	405.94 - 391.44	Main Shallow	SVE Eff. Mon.	X		X	X			
RMP-15A		04/07/2006	430.54	434.00	424.54 - 423.54	A Clay	SVE Eff. Mon.			X				
RMP-15B		04/07/2006	430.54	434.08	419.04 - 413.14	North Olive	SVE Eff. Mon.	X		X				
RMP-16A		05/02/2006	430.78	434.07	424.78 - 423.78	A Clay	SVE Eff. Mon.			X				
RMP-16B		05/01/2006	430.88	434.25	403.38 - 393.89	EPA	SVE Eff. Mon.			X				
RMP-17A		05/03/2006	431.27	434.33	399.77 - 390.28	Main Shallow	SVE Eff. Mon.			X				
RMP-18A		04/04/2006	430.31	430.17	399.91 - 390.41	Main Shallow	SVE Eff. Mon.	X		X				
RMP-19A		04/28/2006	430.72	430.56	398.22 - 388.73	Main Shallow	SVE Eff. Mon.			X				
RMP-20A		05/17/2007	430.92	430.60	424.92 - 423.92	A Clay	SVE Eff. Mon.			X				
RMP-20B		05/17/2007	430.92	430.57	420.92 - 414.62	North Olive	SVE Eff. Mon.			X				
RMP-21A		05/16/2007	430.25	429.88	424.25 - 423.25	A Clay	SVE Eff. Mon.			X				
RMP-21B		05/16/2007	430.25	429.88	419.75 - 413.34	North Olive	SVE Eff. Mon.			X				
RMP-22A		05/21/2007	429.21	428.75	423.21 - 422.21	A Clay	SVE Eff. Mon.			X				
RMP-22B		05/21/2007	429.21	428.86	419.21 - 412.81	North Olive	SVE Eff. Mon.			X				
RMP-23A		05/21/2007	430.01	429.49	425.01 - 424.01	A Clay	SVE Eff. Mon.			X				
RMP-23B		05/21/2007	430.01	429.40	421.01 - 413.78	North Olive	SVE Eff. Mon.			X				
RMP-24A		05/22/2007	430.10	429.69	425.10 - 424.10	A Clay	SVE Eff. Mon.			X				
RMP-24B		05/22/2007	430.10	429.65	421.10 - 413.87	North Olive	SVE Eff. Mon.			X				
RMP-25A		05/22/2007	429.71	429.39	424.71 - 423.71	A Clay	SVE Eff. Mon.			X				
RMP-25B		05/22/2007	429.71	429.43	420.71 - 413.48	North Olive	SVE Eff. Mon.			X				
RMP-26A		05/23/2007	428.75	428.30	423.75 - 422.75	A Clay	SVE Eff. Mon.			X				
RMP-26B		05/23/2007	428.75	428.53	419.75 - 413.35	North Olive	SVE Eff. Mon.			X				
RMP-27A		05/23/2007	429.77	429.42	423.77 - 422.77	A Clay	SVE Eff. Mon.			X				

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								Additional Uses of Well						
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RMP-27B		05/23/2007	429.77	429.53	419.27 - 413.96	North Olive	SVE Eff. Mon.			X				
RMP-28A		05/17/2007	429.86	429.12	423.86 - 422.86	A Clay	SVE Eff. Mon.			X				
RMP-28B		05/17/2007	429.86	429.22	419.36 - 413.95	North Olive	SVE Eff. Mon.			X				
RMP-29A		05/16/2007	430.77	430.56	424.77 - 423.77	A Clay	SVE Eff. Mon.			X				
RMP-29B		05/16/2007	430.77	430.50	420.27 - 413.88	North Olive	SVE Eff. Mon.			X				
RMP-30A		05/15/2007	430.64	430.17	424.64 - 423.64	A Clay	SVE Eff. Mon.			X				
RMP-30B		05/15/2007	430.64	430.15	420.64 - 414.23	North Olive	SVE Eff. Mon.	X		X				
RMP-31A		05/24/2007	430.73	430.17	424.73 - 423.73	A Clay	SVE Eff. Mon.			X				
RMP-31B		05/24/2007	430.73	430.35	420.73 - 413.50	North Olive	SVE Eff. Mon.			X				
RMP-32A		05/18/2007	430.50	429.98	424.50 - 423.50	A Clay	SVE Eff. Mon.			X				
RMP-32B		05/18/2007	430.50	429.98	420.50 - 413.27	North Olive	SVE Eff. Mon.			X				
RMP-33A		05/22/2007	429.03	429.51	423.03 - 422.03	A Clay	SVE Eff. Mon.			X				
RMP-33B		05/22/2007	429.03	429.65	418.53 - 413.22	North Olive	SVE Eff. Mon.			X				
RMP-34A		05/23/2007	429.50	429.26	423.50 - 422.50	A Clay	SVE Eff. Mon.			X				
RMP-34B		05/23/2007	429.50	429.27	419.00 - 413.69	North Olive	SVE Eff. Mon.			X				
RMP-35AR		08/26/2009	430.66	430.33	424.66 - 423.66	A Clay	SVE Eff. Mon			X				
RMP-35BR		08/26/2009	430.66	430.32	420.66 - 413.46	North Olive	SVE Eff. Mon	X		X				
RMP-36AR		11/07/2013	430.8	430.67	424.51 - 424.02	A Clay	SVE Eff. Mon.			X				
RMP-36BR		11/07/2013	430.8	430.68	420.50 - 413.57	North Olive	SVE Eff. Mon.			X				
RMP-37A		07/09/2009	429.11	428.76	420.61 - 411.36	North Olive	LFDPE							E
RMP-37B		07/09/2009	429.19	428.89	400.29 - 389.69	EPA	LFDPE							E
RMP-37C		07/08/2009	429.10	428.83	385.10 - 375.60	Main Below D Clay	LFDPE							X
RMP-38A		09/07/2011	430.9	430.38	424.42 - 423.94	A Clay	None							
RMP-38B		09/07/2011	430.9	430.41	417.81 - 417.34	A Clay	None							
RMP-38C		08/29/2011	430.9	430.56	413.30 - 412.80	North Olive	None							
RMP-38D		09/07/2011	430.9	430.61	400.53 - 400.04	Main Shallow	None							
RMP-39A		09/08/2011	431.4	431.11	424.99 - 424.50	A Clay	None							
RMP-39B		09/08/2011	431.4	431.10	418.41 - 417.92	North Olive	None							
RMP-39C		09/08/2011	431.3	431.04	410.19 - 409.69	B/C Clay Perm Lens	None							
RMP-39D		09/02/2011	431.2	431.01	406.02 - 405.46	Main Shallow	None							
RMW-01A	G01A	11/09/2004	430.14	429.88	424.14 - 419.94	A Clay	Fluid Gauging	X		X				
RMW-01B	G01B	11/10/2004	430.11	429.85	413.11 - 403.61	Main Silt	Fluid Gauging	X	X	X				
RMW-01C	G01C	11/09/2004	430.14	429.56	404.24 - 389.64	Main Shallow	Fluid Gauging	X	X		X			
RMW-01D	G01D	07/10/2005	430.15	429.74	370.30 - 365.86	Main Intermediate	Fluid Gauging	X	X					
RMW-01E	G01E	07/10/2005	430.15	429.73	350.30 - 345.86	Main Deep	Fluid Gauging	X	X					
RMW-01F	G01F	07/10/2005	430.15	429.50	328.82 - 324.38	Main Basal	Fluid Gauging	X	X					
RMW-02A	G02A	10/28/2004	430.61	433.74	421.61 - 412.11	North Olive	Fluid Gauging	X	X	X				
RMW-02B	G02B	10/27/2004	430.59	433.74	411.09 - 406.59	B/C Clay Perm Lens	None							
RMW-02C	G02C	10/27/2004	430.54	433.44	397.94 - 383.39	Main Shallow	Fluid Gauging	X	X					E
RMW-02D	G02D	06/17/2005	430.72	433.46	370.91 - 366.46	Main Intermediate	Fluid Gauging	X	X					
RMW-02E	G02E	06/16/2005	430.67	433.60	350.34 - 345.88	Main Deep	Fluid Gauging	X	X					
RMW-02F	G02F	06/16/2005	430.57	433.72	325.36 - 320.92	Main Basal	Fluid Gauging	X	X					
RMW-03A	G03A	10/21/2004	431.04	434.14	421.54 - 412.04	North Olive	Fluid Gauging	X	X	X				

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Premcor Facility Well Use Table

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								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMW-03C	G03C	08/12/2005	431.14	434.25	385.14 - 380.59	Main Below D Clay	Fluid Gauging	X	X					
RMW-04A	G04A	10/26/2004	430.04	433.19	421.54 - 412.04	North Olive	Fluid Gauging	X						
RMW-04B	G04B	10/26/2004	430.08	433.23	395.98 - 388.93	EPA	Fluid Gauging	X	X					
RMW-04C	G04C	10/25/2004	430.14	433.26	386.24 - 376.54	Main Below D Clay	Fluid Gauging	X	X					
RMW-04D	G04D	07/08/2005	430.06	433.00	364.23 - 359.77	Main Intermediate	Fluid Gauging	X	X					
RMW-04E	G04E	07/08/2005	430.09	432.98	344.09 - 339.63	Main Deep	Fluid Gauging	X	X					
RMW-04F	G04F	07/06/2005	429.96	432.53	325.96 - 321.50	Main Basal	Fluid Gauging	X	X					
RMW-05A	G05A	11/11/2004	428.73	431.92	420.33 - 410.83	North Olive	Fluid Gauging	X	X	X				
RMW-05B	G05B	11/12/2004	428.91	431.88	395.51 - 387.41	EPA	Fluid Gauging	X	X					
RMW-05C	G05C	11/12/2004	428.98	432.13	385.38 - 375.68	Main Below D Clay	Fluid Gauging	X	X					
RMW-06A	G06A	11/19/2004	427.47	430.59	418.87 - 412.97	North Olive	Fluid Gauging	X	X					
RMW-06B	G06B	11/19/2004	427.46	430.58	409.21 - 406.01	B/C Clay Perm Lens	None							
RMW-06C	G06C	11/18/2004	427.45	430.57	404.50 - 400.30	B/C Clay Perm Lens	None							
RMW-06D	G06D	11/18/2004	427.47	430.59	398.72 - 384.12	EPA/Main	Fluid Gauging	X	X					
RMW-06E	G06E	07/22/2005	427.46	430.18	367.46 - 363.01	Main Intermediate	Fluid Gauging	X	X					
RMW-06F	G06F	07/22/2005	427.42	429.83	347.42 - 342.92	Main Deep	Fluid Gauging	X	X					
RMW-06G	G06G	07/21/2005	427.50	430.18	317.50 - 313.00	Main Basal	Fluid Gauging	X	X					
RMW-07A	G07A	11/17/2004	426.05	429.19	416.75 - 407.25	North Olive	Fluid Gauging	X	X	X				
RMW-07B	G07B	11/16/2004	426.17	429.29	405.17 - 400.67	B/C Clay Perm Lens	None							
RMW-07C	G07C	11/16/2004	426.28	429.41	397.68 - 383.18	Main Shallow	Fluid Gauging	X	X				X	
RMW-07D	G07D	08/10/2005	426.73	428.78	366.73 - 362.23	Main Intermediate	Fluid Gauging	X	X					
RMW-07E	G07E	08/10/2005	426.92	429.12	346.92 - 342.42	Main Deep	Fluid Gauging	X	X					
RMW-07F	G07F	08/09/2005	427.11	429.37	317.91 - 313.41	Main Basal	Fluid Gauging	X	X					
RMW-08A	G08A	11/15/2004	432.78	432.57	413.78 - 399.28	Main Silt	Fluid Gauging	X	X					
RMW-08B	G08B	11/15/2004	432.75	432.55	399.45 - 384.85	Main Shallow	Fluid Gauging	X	X					
RMW-08C	G08C	06/15/2006	432.83	432.34	367.83 - 363.39	Main Intermediate	Fluid Gauging	X	X					
RMW-08D	G08D	06/14/2006	432.89	432.43	347.87 - 343.43	Main Deep	Fluid Gauging	X	X					
RMW-08E	G08E	06/14/2006	432.84	432.52	317.99 - 313.56	Main Basal	Fluid Gauging	X	X					
RMW-09A	G09A	11/30/2004	427.66	430.77	419.86 - 405.26	North Olive	Fluid Gauging	X						
RMW-09B	G09B	11/30/2004	427.54	430.79	400.04 - 385.34	EPA	Fluid Gauging	X						
RMW-10A	G10A	11/11/2004	427.50	430.66	418.60 - 410.50	North Olive	Fluid Gauging	X						
RMW-10B	G10B	11/17/2004	427.58	430.50	400.28 - 385.58	Main Shallow	Fluid Gauging	X	X					
RMW-10C	G10C	08/12/2005	428.42	428.16	368.02 - 363.52	Main Intermediate	Fluid Gauging	X	X					
RMW-10D	G10D	08/12/2005	428.44	428.08	353.44 - 348.94	Main Deep	Fluid Gauging	X	X					
RMW-10E	G10E	08/11/2005	428.99	427.90	325.99 - 321.49	Main Basal	Fluid Gauging	X	X					
RMW-11A	G11A	11/11/2004	426.80	429.83	419.40 - 409.90	North Olive	Fluid Gauging	X						
RMW-11B	G11B	11/12/2004	426.86	430.00	407.40 - 403.20	B/C Clay Perm Lens	None							
RMW-11C	G11C	11/12/2004	427.20	430.33	402.70 - 387.90	Main Shallow	Fluid Gauging	X						
RMW-12A	G12A	11/29/2004	429.41	432.50	421.61 - 407.01	North Olive	Fluid Gauging	X						
RMW-12B	G12B	11/24/2004	429.65	432.63	404.05 - 402.05	B/C Clay Perm Lens	None							
RMW-12C	G12C	11/29/2004	429.54	432.31	400.54 - 385.84	Main Shallow	Fluid Gauging	X						
RMW-13A	G13A	11/10/2004	429.42	429.33	420.02 - 406.02	North Olive	Fluid Gauging	X						
RMW-13B	G13B	11/11/2004	429.49	429.32	405.09 - 401.89	B/C Clay Perm Lens	None							

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMW-13C	G13C	11/10/2004	429.41	429.15	395.41 - 380.91	Main Shallow	Fluid Gauging	X						
RMW-14A	G14A	11/19/2004	430.02	433.25	420.72 - 411.22	North Olive	Fluid Gauging	X						
RMW-14B	G14B	11/22/2004	430.21	433.21	409.81 - 400.71	B/C Clay Perm Lens	None							
RMW-14C	G14C	11/22/2004	430.13	433.17	391.93 - 377.33	Main Below D Clay	Fluid Gauging	X						
RMW-15A	G15A	10/29/2004	429.94	433.08	420.44 - 408.34	North Olive	Fluid Gauging	X						
RMW-15B	G15B	10/29/2004	429.97	433.08	405.77 - 402.27	B/C Clay Perm Lens	None							
RMW-15C	G15C	10/28/2004	429.99	433.08	400.09 - 385.59	EPA/Main	Fluid Gauging	X			X			
RMW-15D	G15D	07/20/2005	430.08	432.88	365.13 - 360.63	Main Intermediate	Fluid Gauging	X	X					
RMW-15E	G15E	07/20/2005	430.15	432.90	345.15 - 340.65	Main Deep	Fluid Gauging	X	X					
RMW-15F	G15F	07/20/2005	430.00	432.47	315.00 - 310.50	Main Basal	Fluid Gauging	X	X					
RMW-16A	G16A	11/02/2004	430.44	430.18	416.04 - 401.54	Main Silt	Fluid Gauging	X	X	X				
RMW-16B	G16B	11/02/2004	430.35	430.24	401.15 - 386.65	Main Shallow	Fluid Gauging	X	X					
RMW-16C	G16C	10/19/2005	430.46	430.28	370.61 - 366.17	Main Intermediate	Fluid Gauging	X	X					
RMW-16D	G16D	10/19/2005	430.39	430.27	345.54 - 341.10	Main Deep	Fluid Gauging	X	X					
RMW-16E	G16E	10/19/2005	430.44	430.25	321.61 - 317.17	Main Basal	Fluid Gauging	X						
RMW-17A	G17A	11/02/2004	428.80	431.91	411.50 - 399.40	Main Silt	Fluid Gauging	X	X	X				
RMW-17B	G17B	11/03/2004	428.79	431.90	399.89 - 385.34	Main Shallow	Fluid Gauging	X	X					
RMW-17C	G17C	06/20/2005	428.69	431.56	368.44 - 363.99	Main Intermediate	Fluid Gauging	X	X					
RMW-17D	G17D	06/20/2005	428.69	431.61	343.76 - 339.30	Main Deep	Fluid Gauging	X	X					
RMW-17E	G17E	06/17/2005	428.69	431.64	314.34 - 309.89	Main Basal	Fluid Gauging	X	X					
RMW-18A	G18A	11/04/2004	429.87	429.66	414.47 - 404.97	Main Silt	Fluid Gauging	X						
RMW-18B	G18B	11/04/2004	429.89	429.50	403.89 - 389.49	Main Shallow	Fluid Gauging	X						
RMW-18C	G18C	09/24/2010	430.11	429.37	369.41 - 365.06	Main Intermediate	Fluid Gauging	X						
RMW-19A	G19A	11/09/2004	428.51	431.41	411.11 - 399.01	Main Silt	Fluid Gauging	X	X					
RMW-19B	G19B	11/09/2004	428.66	431.79	400.36 - 385.76	Main Shallow	Fluid Gauging	X	X					
RMW-19C	G19C	09/22/2010	428.73	431.14	369.13 - 364.78	Main Intermediate	Fluid Gauging	X	X					
RMW-20A	G20A	11/01/2004	428.69	431.63	413.89 - 399.29	Main Silt	Fluid Gauging	X	X		X			
RMW-20B	G20B	11/02/2004	428.72	431.65	400.02 - 385.52	Main Shallow	Fluid Gauging	X	X					
RMW-21A	G21A	11/03/2004	429.02	432.26	412.12 - 402.62	Main Shallow	Fluid Gauging	X	X					
RMW-21B	G21B	11/03/2004	428.89	432.18	404.09 - 389.39	Main Shallow	Fluid Gauging	X	X		X			
RMW-21C	G21C	08/16/2005	429.33	429.12	369.33 - 364.83	Main Intermediate	Fluid Gauging	X	X					
RMW-21D	G21D	08/16/2005	429.21	428.80	344.21 - 339.71	Main Deep	Fluid Gauging	X	X					
RMW-21E	G21E	08/15/2005	429.17	428.35	318.17 - 313.67	Main Basal	Fluid Gauging	X	X					
RMW-22A	G22A	11/08/2004	427.77	430.99	410.87 - 401.37	Main Silt	Fluid Gauging	X						
RMW-22B	G22B	11/08/2004	427.76	430.82	402.86 - 388.26	Main Shallow	Fluid Gauging	X						
RMW-23A	G23A	11/03/2004	427.45	430.63	400.35 - 385.85	Main Shallow	Fluid Gauging	X	X					
RMW-24A	G24A	10/22/2004	430.18	433.35	420.68 - 411.18	North Olive	Fluid Gauging	X		X				
RMW-24B	G24B	10/22/2004	430.19	433.33	406.09 - 404.09	B/C Clay Perm Lens	None							
RMW-24C	G24C	10/21/2004	430.20	433.32	400.70 - 386.20	EPA/Main	Fluid Gauging	X						
RMW-24D	G24D	08/15/2005	430.32	433.38	383.32 - 378.77	Main Below D Clay	Fluid Gauging	X						
RMW-25A	G25A	11/01/2004	430.43	433.68	401.43 - 390.53	EPA	Fluid Gauging	X		X				
RMW-25B	G25B	10/29/2004	430.50	433.71	387.10 - 377.60	Main Below D Clay	Fluid Gauging	X						
RMW-26A	G26A	10/25/2004	429.94	433.04	421.04 - 411.54	North Olive	Fluid Gauging	X		X				

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMW-26B	G26B	10/22/2004	430.00	433.11	408.40 - 406.40	B/C Clay Perm Lens	None							
RMW-26C	G26C	10/22/2004	429.80	432.92	400.30 - 392.40	EPA	Fluid Gauging	X						
RMW-26D	G26D	10/21/2004	429.78	432.56	386.18 - 376.78	Main Below D Clay	Fluid Gauging	X						
RMW-27A	G27A	10/28/2004	430.20	429.92	414.50 - 405.00	Main Silt	Fluid Gauging	X		X				
RMW-27B	G27B	10/28/2004	430.17	429.97	403.27 - 388.77	Main Shallow	Fluid Gauging	X						
RMW-28A	G28A	10/26/2004	429.44	432.52	414.94 - 405.34	North Olive	Fluid Gauging	X		X				
RMW-28B	G28B	10/27/2004	429.45	432.53	402.95 - 389.85	EPA	Fluid Gauging	X			X			
RMW-28C	G28C	10/26/2004	429.55	432.66	387.55 - 377.95	Main Below D Clay	Fluid Gauging	X						
RMW-29A	G29A	10/25/2004	429.63	432.74	403.73 - 389.23	Main Silt	Fluid Gauging	X		X				
RMW-30A	G30A	11/10/2004	429.14	429.01	413.14 - 403.64	Main Silt	Fluid Gauging	X		X				
RMW-30B	G30B	11/08/2004	429.08	428.96	404.48 - 389.98	Main Shallow	Fluid Gauging	X		X				
RMW-31A	G31A	11/05/2004	430.28	433.30	414.38 - 404.78	Main Silt	Fluid Gauging	X	X					
RMW-31B	G31B	11/08/2004	430.29	433.35	405.39 - 390.89	Main Shallow	Fluid Gauging	X	X			X		
RMW-31C	G31C	07/27/2005	430.32	433.09	365.32 - 360.82	Main Intermediate	Fluid Gauging	X	X					
RMW-31D	G31D	07/27/2005	430.32	432.99	345.22 - 340.72	Main Deep	Fluid Gauging	X	X					
RMW-31E	G31E	07/26/2005	430.32	432.89	314.52 - 310.02	Main Basal	Fluid Gauging	X	X					
RMW-32A	G32A	12/03/2004	429.43	429.56	417.63 - 408.13	Main Silt	Fluid Gauging	X						
RMW-32B	G32B	12/03/2004	429.29	429.42	405.29 - 390.59	Main Shallow	Fluid Gauging	X				X		
RMW-33A	G33A	11/22/2004	431.54	434.67	424.04 - 411.94	North Olive	Fluid Gauging	X	X					
RMW-33B	G33B	11/22/2004	431.68	434.61	406.68 - 404.68	B/C Clay Perm Lens	None							
RMW-33C	G33C	11/23/2004	431.64	434.72	398.54 - 391.74	EPA	Fluid Gauging	X	X					
RMW-33D	G33D	11/23/2004	431.67	434.61	387.97 - 378.47	Main Below D Clay	Fluid Gauging	X	X					
RMW-34A	G34A	11/23/2004	429.17	432.42	421.37 - 411.87	North Olive	Fluid Gauging	X	X					
RMW-34B	G34B	11/23/2004	429.00	431.93	394.60 - 390.10	EPA	Fluid Gauging	X	X					
RMW-34C	G34C	11/24/2004	429.17	432.10	385.17 - 375.67	Main Below D Clay	Fluid Gauging	X	X					
RMW-34D	G34D	06/08/2006	429.06	432.29	364.05 - 359.61	Main Intermediate	Fluid Gauging	X	X					
RMW-34E	G34E	06/08/2006	428.97	432.17	343.96 - 339.52	Main Deep	Fluid Gauging	X	X					
RMW-34F	G34F	06/07/2006	429.01	432.31	320.50 - 316.06	Main Basal	Fluid Gauging	X	X					
RMW-35A	G35A	12/01/2004	429.36	432.15	421.66 - 410.76	North Olive	Fluid Gauging	X	X					
RMW-35B	G35B	12/02/2004	429.20	432.51	391.20 - 388.00	EPA	Fluid Gauging	X	X					
RMW-35C	G35C	12/01/2004	429.04	432.25	384.84 - 375.34	Main Below D Clay	Fluid Gauging	X	X					
RMW-35D	G35D	07/19/2005	428.94	431.83	359.94 - 355.44	Main Intermediate	Fluid Gauging	X	X					
RMW-35E	G35E	07/19/2005	428.94	431.93	339.94 - 335.34	Main Deep	Fluid Gauging	X	X					
RMW-35F	G35F	07/13/2005	428.94	432.44	316.92 - 312.48	Main Basal	Fluid Gauging	X	X					
RMW-36A	G36A	12/02/2004	428.70	431.72	421.50 - 412.00	North Olive	Fluid Gauging	X	X					
RMW-36B	G36B	12/01/2004	428.73	431.56	402.13 - 387.63	EPA	Fluid Gauging	X	X					
RMW-36C	G36C	12/01/2004	428.77	431.87	384.37 - 374.87	Main Below D Clay	Fluid Gauging	X	X					
RMW-36D	G36D	07/25/2005	428.62	431.27	363.82 - 359.32	Main Intermediate	Fluid Gauging	X	X					
RMW-36E	G36E	07/25/2005	428.62	431.15	343.82 - 339.32	Main Deep	Fluid Gauging	X	X					
RMW-36F	G36F	07/25/2005	428.62	431.34	324.32 - 319.82	Main Basal	Fluid Gauging	X	X					
RMW-37A	G37A	12/02/2004	431.13	431.47	418.23 - 403.83	Main Silt	Fluid Gauging	X	X	X				
RMW-37B	G37B	12/02/2004	431.22	431.59	404.22 - 389.82	Main Shallow	Fluid Gauging	X	X					
RMW-38A	G38	12/03/2004	430.10	433.02	388.60 - 359.00	Main Below D Clay	Fluid Gauging	X			X			

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMW-39A	G39A	02/01/2005	428.08	431.01	418.28 - 413.68	Main Silt	None							
RMW-39B	G39B	02/01/2005	428.35	431.22	412.35 - 402.85	Main Silt	None							
RMW-39C	G39C	01/31/2005	428.42	431.26	403.62 - 389.02	Main Shallow	Fluid Gauging	X						
RMW-40	G040	02/24/2005	429.82	432.49	397.12 - 391.32	EPA	Fluid Gauging	X						
RMW-41A	G41A	06/30/2005	431.09	433.97	371.76 - 367.30	Main Intermediate	Fluid Gauging	X	X					
RMW-41B	G41B	06/29/2005	431.09	434.07	351.09 - 346.63	Main Deep	Fluid Gauging	X	X					
RMW-41C	G41C	06/29/2005	431.09	434.16	323.21 - 318.79	Main Basal	Fluid Gauging	X	X					
RMW-42A	G42A	05/06/2005	428.21	431.83	421.91 - 409.81	North Olive	Fluid Gauging	X		X				
RMW-42B	G42B	05/06/2005	428.66	432.08	398.66 - 389.16	EPA	Fluid Gauging	X		X				
RMW-42C	G42C	05/05/2005	428.96	432.08	385.76 - 376.26	Main Below D Clay	Fluid Gauging	X						
RMW-43A	G43A	06/22/2005	430.99	433.88	370.69 - 366.23	Main Intermediate	Fluid Gauging	X	X					
RMW-43B	G43B	06/21/2005	430.49	433.38	345.33 - 340.87	Main Deep	Fluid Gauging	X	X					
RMW-43C	G43C	06/21/2005	429.95	432.82	311.20 - 306.75	Main Basal	Fluid Gauging	X						
RMW-44AR	44AR	09/25/2010	431.73	430.90	371.43 - 367.08	Main Intermediate	Fluid Gauging	X	X					
RMW-44BR	44BR	09/25/2010	431.52	430.98	351.32 - 346.97	Main Deep	Fluid Gauging	X	X					
RMW-44C	G44C	07/11/2005	431.31	430.99	320.46 - 316.02	Main Basal	Fluid Gauging	X	X					
RMW-45A	G45A	08/17/2005	431.16	431.11	423.66 - 414.26	North Olive	Fluid Gauging	X	X					
RMW-45B	G45B	08/17/2005	431.16	430.88	401.16 - 386.76	Main Shallow	Fluid Gauging	X	X					
RMW-45C	G45C	08/16/2005	431.16	430.87	384.16 - 379.61	Main Shallow	Fluid Gauging	X	X					
RMW-46A	G46A	08/19/2005	429.67	428.89	419.17 - 414.67	North Olive	Fluid Gauging	X		X				
RMW-46B	G46B	08/19/2005	429.67	429.18	402.67 - 391.22	EPA	Fluid Gauging	X						
RMW-46C	G46C	08/18/2005	429.67	429.09	387.67 - 378.22	Main Below D Clay	Fluid Gauging	X						
RMW-47A	G47A	08/23/2005	430.58	433.84	421.58 - 412.13	North Olive	Fluid Gauging	X	X	X				
RMW-47B	G47B	08/23/2005	430.47	433.53	399.47 - 390.02	EPA	Fluid Gauging	X	X		X			
RMW-47C	G47C	08/22/2005	430.51	433.54	388.51 - 379.06	Main Below D Clay	Fluid Gauging	X	X					
RMW-48A	G48A	08/24/2005	431.30	433.85	423.30 - 416.85	North Olive	Fluid Gauging	X	X	X				
RMW-48B	G48B	08/24/2005	431.27	434.15	398.77 - 384.22	Main Shallow	Fluid Gauging	X	X					E
RMW-49A	G49A	08/26/2005	430.20	430.08	419.70 - 414.15	North Olive	Fluid Gauging	X	X	X				
RMW-49B	G49B	08/26/2005	430.20	430.00	398.20 - 383.75	Main Shallow	Fluid Gauging	X	X					
RMW-50A	G50A	10/21/2005	428.43	431.92	403.38 - 388.97	Main Shallow	Fluid Gauging	X	X					
RMW-50B	G50B	10/21/2005	428.34	431.76	368.49 - 364.05	Main Intermediate	Fluid Gauging	X	X					
RMW-50C	G50C	10/20/2005	428.26	431.74	343.41 - 338.97	Main Deep	Fluid Gauging	X	X					
RMW-50D	G50D	10/20/2005	428.24	431.67	309.39 - 304.95	Main Basal	Fluid Gauging	X	X					
RMW-51A	G51A	10/26/2005	428.65	428.70	403.77 - 389.36	Main Shallow	Fluid Gauging	X	X					
RMW-51B	G51B	10/26/2005	428.67	428.52	374.82 - 370.38	Main Intermediate	Fluid Gauging	X	X					
RMW-51C	G51C	10/25/2005	428.62	428.81	343.60 - 339.16	Main Deep	Fluid Gauging	X	X					
RMW-51D	G51D	10/25/2005	428.68	428.31	311.33 - 306.89	Main Basal	Fluid Gauging	X						
RMW-52A	G52A	11/04/2005	428.80	432.40	403.90 - 389.50	Main Shallow	Fluid Gauging	X	X					
RMW-52B	G52B	11/03/2005	428.75	432.38	363.75 - 359.35	Main Intermediate	Fluid Gauging	X	X					
RMW-52C	G52C	11/03/2005	428.86	432.31	343.96 - 339.56	Main Deep	Fluid Gauging	X	X					
RMW-52D	G52D	11/03/2005	428.78	432.26	310.88 - 306.48	Main Basal	Fluid Gauging	X						
RMW-53A	G53A	11/01/2005	430.18	433.59	361.28 - 356.88	Main Intermediate	Fluid Gauging	X	X					
RMW-53B	G53B	11/01/2005	430.08	433.48	341.18 - 336.78	Main Deep	Fluid Gauging	X	X					

SR000227

TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMW-53C	G53C	11/01/2005	429.98	433.49	314.08 - 309.68	Main Basal	Fluid Gauging	X						
RMW-54A	G54A	10/21/2005	430.02	431.84	366.17 - 361.73	Main Intermediate	Fluid Gauging	X	X					
RMW-54B	G54B	10/27/2005	429.89	431.75	345.04 - 340.60	Main Deep	Fluid Gauging	X	X					
RMW-54C	G54C	10/27/2005	429.81	431.66	314.96 - 310.52	Main Basal	Fluid Gauging	X						
RMW-55A	G55A	11/08/2005	427.88	429.94	362.98 - 358.48	Main Intermediate	Fluid Gauging	X	X					
RMW-55B	G55B	11/08/2005	427.86	430.10	342.96 - 338.46	Main Deep	Fluid Gauging	X	X					
RMW-55C	G55C	11/07/2005	427.86	430.15	312.06 - 307.56	Main Basal	Fluid Gauging	X						
RMW-56A	G56A	11/03/2005	431.32	434.63	401.92 - 390.42	EPA	Fluid Gauging	X						
RMW-56B	G56B	11/02/2005	431.47	434.40	385.57 - 376.07	Main Below D Clay	Fluid Gauging	X						
RMW-57A	G57A	04/17/2006	431.23	434.33	404.23 - 391.13	EPA	Fluid Gauging	X	X	X				
RMW-57B	G57B	04/14/2006	431.17	434.28	388.17 - 378.67	Main Below D Clay	Fluid Gauging	X	X					
RMW-58A	G58A	02/13/2006	431.25	431.11	399.35 - 390.65	EPA	None							
RMW-58B	G58B	02/13/2006	431.29	431.15	386.79 - 377.29	Main Below D Clay	None							
RMW-59A	G59A	02/08/2006	431.13	431.01	399.13 - 390.73	EPA	Fluid Gauging	X			X			
RMW-59B	G59B	02/15/2006	431.29	431.15	386.79 - 377.29	Main Below D Clay	None							
RMW-60A	G60A	02/08/2006	431.22	430.88	421.82 - 413.62	North Olive	Fluid Gauging	X						
RMW-60B	G60B	02/07/2006	431.16	430.95	400.36 - 389.76	EPA	Fluid Gauging	X					X	
RMW-60C	G60C	02/06/2006	431.13	430.95	386.63 - 377.13	Main Below D Clay	Fluid Gauging	X						
RMW-61A	G61A	02/03/2006	430.19	430.04	398.69 - 387.29	EPA	Fluid Gauging	X	X					
RMW-61B	G61B	02/02/2006	430.16	429.84	384.66 - 375.26	Main Below D Clay	Fluid Gauging	X	X					
RMW-62A	G62A	02/01/2006	430.03	429.84	398.73 - 387.33	EPA	Fluid Gauging	X			X			
RMW-62B	G62B	01/31/2006	429.96	429.65	384.46 - 375.06	Main Below D Clay	None							
RMW-63A	G63A	01/30/2006	430.10	429.86	420.10 - 412.62	North Olive	None							
RMW-63B	G63B	01/30/2006	429.95	429.76	398.95 - 386.45	EPA	Fluid Gauging	X						
RMW-63C	G63C	01/27/2006	429.87	429.66	383.87 - 374.45	Main Below D Clay	None							
RMW-64A	G64A	04/11/2006	430.27	433.69	424.26 - 423.26	A Clay	Fluid Gauging	X		X				
RMW-64B	G64B	04/11/2006	430.25	433.62	402.21 - 390.11	EPA	Fluid Gauging	X		X				
RMW-64C	G64C	04/10/2006	430.37	433.72	388.07 - 378.55	Main Below D Clay	Fluid Gauging	X						
RMW-65A	G65A	06/23/2006	431.16	433.79	413.66 - 404.16	Main Silt	Fluid Gauging	X	X					
RMW-65B	G65B	06/23/2006	431.17	433.90	406.17 - 391.49	Main Shallow	Fluid Gauging	X	X					
RMW-65C	G65C	06/13/2006	430.89	433.81	370.86 - 366.43	Main Intermediate	Fluid Gauging	X	X					
RMW-65D	G65D	06/13/2006	430.83	433.77	350.82 - 346.39	Main Deep	Fluid Gauging	X	X					
RMW-65E	G65E	06/12/2006	430.84	433.77	323.88 - 319.40	Main Basal	Fluid Gauging	X	X					
RMW-66A	G66A	06/21/2006	430.44	430.16	414.44 - 404.93	Main Silt	Fluid Gauging	X	X					
RMW-66B	G66B	06/21/2006	430.48	430.13	405.48 - 390.78	Main Shallow	Fluid Gauging	X	X					
RMW-66C	G66C	06/09/2006	430.51	430.19	370.51 - 366.06	Main Intermediate	Fluid Gauging	X	X					
RMW-66D	G66D	06/09/2006	430.49	429.89	355.39 - 350.94	Main Deep	Fluid Gauging	X	X					
RMW-66E	G66E	06/09/2006	430.54	429.98	332.56 - 328.11	Main Basal	Fluid Gauging	X	X					
RMW-67A	G67A	06/20/2006	431.30	431.00	414.80 - 405.29	Main Silt	Fluid Gauging	X	X					
RMW-67B	G67B	06/19/2006	431.34	430.95	406.34 - 391.70	Main Shallow	Fluid Gauging	X	X					
RMW-67C	G67C	06/27/2006	431.34	430.92	371.34 - 366.89	Main Intermediate	Fluid Gauging	X	X					
RMW-68A	G68A	07/07/2006	429.90	432.96	423.88 - 414.29	North Olive	Fluid Gauging	X						
RMW-68B	G68B	07/06/2006	429.95	432.96	407.95 - 403.63	B/C Clay Perm Lens	Fluid Gauging	X						

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMW-68C	G68C	07/10/2006	429.86	432.77	396.54 - 389.88	EPA	Fluid Gauging	X	X					
RMW-68D	G68D	07/05/2006	429.78	432.63	386.28 - 376.74	Main Below D Clay	Fluid Gauging	X	X					
RMW-68E	G68E	06/19/2006	429.66	432.52	364.66 - 360.22	Main Intermediate	Fluid Gauging	X	X					
RMW-68F	G68F	06/19/2006	429.61	432.51	344.65 - 340.21	Main Deep	Fluid Gauging	X	X					
RMW-68G	G68G	06/16/2006	429.50	432.47	317.50 - 313.06	Main Basal	Fluid Gauging	X	X					
RMW-69A	G69A	06/27/2006	429.21	432.38	418.21 - 411.13	North Olive	Fluid Gauging	X						
RMW-69B	G69B	06/28/2006	429.28	432.45	399.83 - 392.21	EPA	Fluid Gauging	X	X					
RMW-69C	G69C	06/29/2006	429.38	432.48	388.88 - 379.38	Main Below D Clay	Fluid Gauging	X	X					
RMW-69D	G69D	06/21/2006	429.44	432.48	364.44 - 360.00	Main Intermediate	Fluid Gauging	X	X					
RMW-69E	G69E	06/20/2006	429.44	432.59	344.44 - 340.00	Main Deep	Fluid Gauging	X	X					
RMW-69F	G69F	06/20/2006	429.43	432.73	318.43 - 313.99	Main Basal	Fluid Gauging	X	X					
RMW-70A	G70A	07/11/2006	429.25	432.31	419.25 - 412.35	North Olive	Fluid Gauging	X						
RMW-70B	G70B	07/11/2006	429.30	432.41	404.80 - 399.11	Main Silt	Fluid Gauging	X	X					
RMW-70C	G70C	06/30/2006	429.40	432.35	390.90 - 381.39	Main Shallow	Fluid Gauging	X	X					
RMW-70D	G70D	06/26/2006	429.39	432.17	369.39 - 364.97	Main Intermediate	Fluid Gauging	X	X					
RMW-70E	G70E	06/26/2006	429.19	428.69	349.19 - 344.77	Main Deep	Fluid Gauging	X	X					
RMW-70F	G70F	06/26/2006	429.17	428.89	317.17 - 312.72	Main Basal	Fluid Gauging	X	X					
RMW-71A	G71A	06/22/2006	429.41	429.00	369.41 - 364.97	Main Intermediate	Fluid Gauging	X	X					
RMW-71B	G71B	06/22/2006	429.21	428.84	349.21 - 344.77	Main Deep	Fluid Gauging	X	X					
RMW-71C	G71C	06/21/2006	429.16	428.76	318.16 - 313.72	Main Basal	Fluid Gauging	X	X					
RMW-72A		07/20/2006	429.59	429.39	418.99 - 411.12	North Olive	Fluid Gauging	X						
RMW-72B		07/19/2006	429.61	429.41	401.94 - 389.19	EPA	Fluid Gauging	X						E
RMW-72C		07/13/2006	429.61	429.48	386.59 - 377.09	Main Below D Clay	Fluid Gauging	X						
RMW-73A		07/21/2006	430.38	430.24	418.91 - 414.42	North Olive	Fluid Gauging	X						
RMW-73B		07/20/2006	430.38	430.23	397.51 - 389.85	EPA	Fluid Gauging	X						
RMW-73C		07/12/2006	430.41	430.24	386.45 - 376.96	Main Below D Clay	Fluid Gauging	X						
RMW-80A		05/31/2007	430.58	430.19	396.58 - 390.98	EPA	Fluid Gauging	X						
RMW-80B		05/30/2007	430.70	430.10	387.30 - 377.78	Main Below D Clay	Fluid Gauging	X						
RMW-81A		06/13/2007	431.44	430.90	420.94 - 413.03	North Olive	Fluid Gauging	X						
RMW-81B		06/12/2007	431.33	431.04	403.33 - 391.44	EPA	Fluid Gauging	X				X		
RMW-81C		06/11/2007	431.41	431.12	387.41 - 377.89	Main Below D Clay	Fluid Gauging	X						
RMW-82A		06/07/2007	428.11	427.66	419.11 - 412.61	North Olive	Fluid Gauging	X						
RMW-82B		06/06/2007	428.20	427.86	400.88 - 390.27	EPA	Fluid Gauging	X			X			
RMW-82C		06/08/2007	428.23	427.73	388.23 - 378.68	Main Below D Clay	Fluid Gauging	X						
RMW-83A		06/15/2007	433.55	433.30	419.55 - 415.57	North Olive	Fluid Gauging	X						
RMW-83B		06/15/2007	433.69	430.86	402.69 - 387.66	Main Shallow	Fluid Gauging	X					X	
RMW-84A		06/05/2007	433.88	433.32	418.38 - 408.88	North Olive	Fluid Gauging	X						
RMW-84B		06/04/2007	433.85	433.47	400.05 - 388.05	EPA	Fluid Gauging	X						
RMW-84C		06/01/2007	433.88	433.52	384.88 - 375.36	Main Below D Clay	Fluid Gauging	X						
RMW-85A		06/20/2007	430.73	430.35	421.73 - 413.75	North Olive	Fluid Gauging	X						
RMW-85B		06/19/2007	430.62	430.23	397.66 - 390.08	EPA	Fluid Gauging	X			X			
RMW-85C		06/18/2007	430.57	430.25	387.07 - 377.12	Main Below D Clay	Fluid Gauging	X						
RMW-86A		06/22/2007	433.72	433.52	420.22 - 412.46	North Olive	Fluid Gauging	X						

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RMW-86B		06/21/2007	433.74	433.54	396.44 - 390.84	EPA	Fluid Gauging	X						
RMW-86C		06/25/2007	433.78	433.44	388.28 - 378.76	Main Below D Clay	Fluid Gauging	X						
RMW-87A		07/05/2007	429.54	429.25	421.34 - 411.59	North Olive	Fluid Gauging	X						
RMW-87B		07/05/2007	429.60	429.41	397.00 - 391.40	EPA	Fluid Gauging	X						
RMW-87C		07/06/2007	429.65	428.97	388.55 - 379.03	Main Below D Clay	Fluid Gauging	X						
RMW-88A		07/11/2007	428.50	428.18	403.00 - 388.87	EPA	Fluid Gauging	X						
RMW-88B		07/10/2007	428.49	428.29	387.29 - 377.77	Main Below D Clay	Fluid Gauging	X						
RMW-89A	G89A	07/17/2007	429.16	429.07	414.16 - 404.57	Main Silt	Fluid Gauging	X	X					
RMW-89B	G89B	07/13/2007	429.12	429.00	404.42 - 389.74	Main Shallow	Fluid Gauging	X	X			X		
RMW-90A	G90A	07/23/2007	430.26	430.01	412.76 - 403.49	Main Silt	Fluid Gauging	X	X					
RMW-90B	G90B	07/23/2007	430.21	429.83	405.31 - 390.21	Main Shallow	Fluid Gauging	X	X		X			
RMW-91A		07/27/2007	426.00	426.32	420.00 - 412.96	A Clay Perm Lens	None							
RMW-91B		07/26/2007	425.95	428.65	400.05 - 385.75	EPA	Fluid Gauging	X						
RMW-91C		07/25/2007	425.95	428.88	383.55 - 373.50	Main Below D Clay	Fluid Gauging	X						
RMW-92A		07/19/2007	431.76	431.60	416.85 - 407.23	Main Silt	None							
RMW-92B		07/18/2007	431.96	431.73	407.16 - 392.58	Main Shallow	Fluid Gauging	X						
RMW-93A		09/26/2006	429.52	429.31	421.44 - 409.59	North Olive	Fluid Gauging	X		X				
RMW-93B		09/27/2006	429.53	429.30	399.07 - 389.58	EPA	Fluid Gauging	X						E
RMW-94A		09/25/2006	429.88	429.73	419.88 - 410.43	North Olive	Fluid Gauging	X		X				
RMW-94B		09/22/2006	430.01	429.69	399.71 - 385.04	Main Shallow	Fluid Gauging	X						E
RMW-95		09/18/2006	430.13	429.82	400.09 - 385.20	Main Shallow	None							
RMW-96		09/20/2006	430.15	429.84	399.11 - 384.60	Main Shallow	None							
RMW-97		09/21/2006	430.08	429.95	399.09 - 384.43	Main Shallow	Fluid Gauging	X						
RMW-98A		10/19/2006	430.06	429.90	415.06 - 405.58	Main Silt	Fluid Gauging	X		X				
RMW-98B		10/19/2006	430.05	429.84	405.05 - 390.37	Main Silt	Fluid Gauging	X				X		
RMW-99A		06/09/2010	428.52	431.46	419.83 - 408.45	North Olive	Fluid Gauging	X						
RMW-99B		06/09/2010	428.53	431.40	400.50 - 386.09	Main Shallow	Fluid Gauging	X					X	
RMW-100A	100A	09/23/2010	428.19	430.51	372.39 - 368.04	Main Intermediate	Fluid Gauging	X	X					
RMW-101A	101A	09/21/2010	435.58	435.03	410.38 - 391.03	Main Shallow	Fluid Gauging	X						
RMW-102A	102A	03/07/2012	427.8	430.34	400.06 - 391.72	EPA	Fluid Gauging	X	X					
RMW-102B	102B	03/06/2012	427.9	430.57	385.20 - 375.81	Main Below D Clay	Fluid Gauging	X	X					
RMW-103A	103A	02/24/2012	430.5	430.19	397.10 - 392.60	Main Shallow	Fluid Gauging	X	X					
RMW-103B	103B	02/23/2012	430.6	430.26	388.70 - 384.05	Main Shallow	Fluid Gauging	X	X					
RMW-104A	104A	09/07/2011	433.0	432.64	399.68 - 393.75	B/C Clay Perm Lens	Fluid Gauging	X	X					
RMW-104B	104B	08/31/2011	432.9	432.71	388.40 - 379.10	Main Shallow	Fluid Gauging	X	X					
RMW-105A	105A	02/26/2012	430.8	430.39	400.52 - 393.67	B/C Clay Perm Lens	Fluid Gauging	X	X					
RMW-105B	105B	02/25/2012	430.8	430.51	388.25 - 378.85	Main Shallow	Fluid Gauging	X	X					
RPW-01		10/20/2005	431.72	432.15	399.92 - 359.82	EPA/Main	Fluid Gauging	X						
RPW-02		02/11/2013	431.0	429.47	399.50 - 390.00	EPA	Gradient Control				X			
RPW-03		02/11/2013	431.1	429.87	384.30 - 369.80	Main Below D Clay	Gradient Control							
RSVE-01		02/27/2006	431.09	430.07	420.09 - 414.69	North Olive	SVE Well							
RSVE-02		02/28/2006	430.83	429.93	419.83 - 414.23	North Olive	SVE Well							
RSVE-03		03/13/2006	430.24	429.23	419.24 - 413.54	North Olive	SVE Well							

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RSVE-04		02/28/2006	430.70	430.03	419.70 - 414.10	North Olive	SVE Well							
RSVE-05		03/01/2006	429.99	430.01	418.99 - 413.49	North Olive	SVE Well							
RSVE-06		03/02/2006	431.06	430.33	420.06 - 414.56	North Olive	SVE Well							
RSVE-07		03/06/2006	430.51	429.71	419.51 - 414.01	North Olive	SVE Well							
RSVE-08		03/07/2006	430.21	430.11	419.21 - 413.71	North Olive	SVE Well							
RSVE-09		03/07/2006	430.69	430.40	415.69 - 406.19	Main Silt	SVE Well							
RSVE-10		03/14/2006	430.11	429.70	414.17 - 404.67	Main Silt	SVE Well							
RSVE-11		08/25/2006	430.15	430.01	419.52 - 412.90	North Olive	SVE Well							
RSVE-12		09/01/2006	429.94	429.75	418.14 - 412.05	North Olive	SVE Well							
RSVE-13		08/31/2006	429.75	429.84	418.25 - 413.30	North Olive	SVE Well							
RSVE-14		08/28/2006	429.18	429.60	417.88 - 411.23	North Olive	SVE Well							
RSVE-15		08/30/2006	429.83	429.39	418.33 - 412.33	North Olive	SVE Well							
RSVE-16		08/29/2006	429.40	429.31	418.40 - 412.15	North Olive	SVE Well							
RVMP-01A		12/10/2004	428.86	428.86	422.86 - 422.36	A Clay	Vapor Monitoring			X				
RVMP-01B		12/10/2004	428.86	428.86	409.86 - 409.36	Main Silt	Vapor Monitoring			X				
RVMP-01C		12/10/2004	428.86	428.86	405.36 - 404.86	Main Shallow	Vapor Monitoring			X				
RVMP-02A		12/09/2004	430.36	430.36	424.36 - 423.86	A Clay	Vapor Monitoring			X				
RVMP-02B		12/09/2004	430.36	430.36	415.86 - 415.36	A Clay	Vapor Monitoring			X				
RVMP-02C		12/09/2004	430.36	430.36	407.36 - 406.86	Main Silt	Vapor Monitoring			X				
RVMP-03A		12/07/2004	430.09	430.09	424.09 - 423.59	A Clay	Vapor Monitoring			X				
RVMP-03B		12/07/2004	430.09	430.09	412.89 - 412.39	Main Silt	Vapor Monitoring							
RVMP-03C		12/07/2004	430.09	430.09	407.09 - 406.59	Main Silt	Vapor Monitoring							
RVMP-04A		12/10/2004	431.14	431.14	425.14 - 424.64	A Clay	Vapor Monitoring			X				
RVMP-04B		12/10/2004	431.14	431.14	418.14 - 417.64	Main Silt	Vapor Monitoring			X				
RVMP-04C		12/10/2004	431.14	431.14	408.14 - 407.64	Main Silt	Vapor Monitoring			X				
RVMP-05A		12/08/2004	430.69	430.69	425.19 - 424.69	A Clay	Vapor Monitoring			X				
RVMP-05B		12/08/2004	430.69	430.69	420.69 - 420.19	North Olive	None							
RVMP-05C		12/08/2004	430.69	430.69	411.69 - 411.19	B/C Clay	Vapor Monitoring			X				
RVMP-05D		12/08/2004	430.69	430.69	407.69 - 407.19	B/C Clay Perm Lens	Vapor Monitoring			X				
RVMP-05E		12/08/2004	430.69	430.69	402.69 - 402.19	B/C Clay	Vapor Monitoring			X				
RVMP-06A		12/08/2004	431.23	431.23	425.23 - 424.73	A Clay	Vapor Monitoring			X				
RVMP-06B		12/08/2004	431.23	431.23	420.73 - 420.23	North Olive	Vapor Monitoring							
RVMP-06C		12/08/2004	431.23	431.23	411.73 - 411.23	B/C Clay	Vapor Monitoring			X				
RVMP-06D		12/08/2004	431.23	431.23	401.23 - 400.73	EPA	Vapor Monitoring							E
RVMP-07A		12/07/2004	431.74	431.74	426.44 - 425.94	A Clay	Vapor Monitoring			X				
RVMP-07B		12/07/2004	431.74	431.74	421.94 - 421.44	North Olive	Vapor Monitoring			X				
RVMP-07C		12/07/2004	431.74	431.74	411.94 - 411.44	B/C Clay	Vapor Monitoring			X				
RVMP-07D		12/07/2004	431.74	431.74	405.94 - 405.44	B/C Clay Perm Lens	Vapor Monitoring			X				
RVMP-07E		12/07/2004	431.74	431.74	401.94 - 401.54	B/C Clay	Vapor Monitoring			X				
RVMP-08A		12/07/2004	429.50	429.50	424.20 - 423.70	A Clay	Vapor Monitoring			X				
RVMP-08B		12/07/2004	429.50	429.50	419.70 - 419.20	North Olive	Vapor Monitoring			X				
RVMP-08C		12/07/2004	429.50	429.50	407.70 - 407.20	B/C Clay	Vapor Monitoring			X				

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TABLE 3-2
Premcor Facility Well Use Table

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

								Additional Uses of Well						
Well ID	Illinois EPA Well ID[1]	Date Installed	Ground Surface Elev. (feet MSL)	Top of Casing Elev. (feet MSL)	Screened Interval (feet MSL)	Stratum Screened	Primary Use of Well	Fluid Gauging[2]	GW Monitoring[3]	SVE Effectiveness Monitoring[4]	LNAPL SPR[5]	LNAPL PMR[6]	Mobile ICE Unit[7]	LFDPE[8]
RVMP-09A		12/13/2004	429.10	429.10	423.10 - 422.60	A Clay	Vapor Monitoring			X				
RVMP-09B		12/13/2004	429.10	429.10	419.10 - 418.60	North Olive	Vapor Monitoring			X				
RVMP-09C		12/13/2004	429.10	429.10	407.60 - 407.10	B/C Clay	Vapor Monitoring			X				
SW-01		10/11/1995	419.71	420.67	380.34 - 375.34	Main Shallow	Fluid Gauging	X						
SW-02		10/12/1995	419.13	419.72	380.69 - 375.69	Main Shallow	Fluid Gauging	X						
SW-03		10/17/1995	420.67	421.05	383.03 - 378.03	Main Shallow	Fluid Gauging	X						
SW-04		10/17/1995	420.53	421.25	381.22 - 376.22	Main Shallow	Fluid Gauging	X						
T-01	T001	12/12/1996	429.13	431.50	408.13 - 388.13	Main Shallow	Fluid Gauging	X	X					

NOTES:

ft msl = Feet above mean sea level.

X = Indicates well is used for specified program.

E = Indicates wells added to the SVE effectiveness monitoring when the LFDPE System was brought on line.

R = Indicates well was removed from specified program during the quarter presented in the Quarterly Status Report.

N = Indicates well was added to specified program during the quarter presented in the Quarterly Status Report.

This table is current for the quarter presented in the Quarterly Status Report.

[1]Illinois EPA Well IDs have only been assigned to wells that are currently or have been previously in the Illinois EPA-approved Groundwater Monitoring Plan.

[2]Fluid Gauging: Locations of wells where water and/or free product levels are measured.

[3]GW Monitoring: The wells that are being sampled in accordance with the Illinois EPA-approved Groundwater Monitoring Plan.

[4]SVE Effectiveness Monitoring: Wells that are being monitored for evaluating the effectiveness of the western property boundary SVE System.

[5]LNAPL SPR: Wells that contain a pneumatic LNAPL skimmer pump.

[6]LNAPL PMR: Wells where LNAPL is removed by a vacuum truck on a weekly basis.

[7]Mobile ICE Unit: Identification of the wells where the Mobile ICE Unit is currently recovering LNAPL.

[8]LFDPE: Wells that are part of the Low-Flow Dual-Phase Extraction System.

TABLE 3-3
Volume of LNAPL Recovery by Technology

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Recovery Technology	Operation Dates	LNAPL Removal (gallons)					Recovery Total
		Q1 2017	Q2 2017	Q3 2017	Q4 2017	2017	
LNAPL Recovery Pumps[1]	January 1994 to December 2002	--	--	--	--	--	**350,000**
Skimmer Pump Recovery (SPR)	June 2003 to present	**664**	**907**	**1,234**	**278**	**3,083**	**571,579**
Premcor Mobile ICE Unit[2]							
RMW-72B	June to October 2007	--	--	--	--	--	35,000
RMW-49B	November 2007	--	--	--	--	--	61
RMW-95	November to December 2007	--	--	--	--	--	1,234
RMW-96	December 2007	--	--	--	--	--	74
RMW-95/RMW-96	December 2007 to March 2008	--	--	--	--	--	15,700
RMW-45B	April 2008 to June 2008	--	--	--	--	--	8,860
RMW-72B	July 9, 2008 to April 2011	--	--	--	--	--	42,600
RMW-99B	May 11, 2011 to present	2,662	1,812	2,632	1,416	8,522	390,759
RMW-07C	September 9, 2013 to present	5	288	212	88	593	51,940
RMW-83B	October 8, 2013 to present	325	232	253	81	891	22,951
RB-55	October 28, 2014 to present	6,832	4,850	5,328	1,845	18,855	146,962
RMW-60B	November 5, 2014 to present	8,212	5,833	6,405	2,099	22,549	161,929
	TOTAL MOBILE ICE UNIT GALLONS	**18,036**	**13,015**	**14,830**	**5,529**	**51,410**	**878,070**
SVE System[3]	September 2006 to present	**1,428**	**2,425**	**698**	**1,881**	**6,432**	**125,710**
LFDPE System[2]	December 2010 through mid-December 2015	--	--	--	--	--	**140,885**
LFDPE System[3]	Mid-December 2015 to present	**85**	**179**	**258**	**77**	**599**	**1,109**
MPE Pilot Tests[2]	August and September 2004	--	--	--	--	--	**310**
Extended LFDPE Pilot Tests	October 2005 to March 2007	--	--	--	--	--	**14,460**
Short-Term HVR & LFDPE Pilot Tests	November 2005 to June 2006	--	--	--	--	--	**7,630**
Periodic Manual Removal (PMR)	May 2005 to present	**127**	**117**	**129**	**29**	**402**	**21,207**
TOTAL GALLONS		**20,340**	**16,643**	**17,149**	**7,794**	**61,926**	**2,110,960**

NOTES:
(1) = Total volume based on review of documents and information from that time period.
(2) = LNAPL and equivalent gallons of gasoline from vapor removal.
(3) = Equivalent gallons of gasoline from vapor removal.
-- = This recovery technology not being used during this period.
ICE = Internal Combustion Engine
SVE = Soil Vapor Extraction
LFDPE = Low-Flow Dual Phase Extraction
HVR = High Vacuum Removal
MPE = Multi-Phase Extraction

TABLE 3-4
LNAPL Transmissivity Test Summary Table
Premcor Main Facility

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	LNAPL District	Stratum Screened	Test Date	LNAPL Removal Method	Tn Value (ft2/day)	Test Method	Calculation Method	Corr. GW Elev. (ft msl)	Apparent Thickness (ft)	Est. Mobile NAPL Interface	Conditions
RB-08	LNAPL_District_4	EPA/Main	6/19/2003	SPR	4.46	BDT	--	409.91	7.04	4.11	PERCHED
RB-10	LNAPL_District_4	EPA/Main	6/16/2003	SPR	0.03	BDT	AQWIN	400.88	12.73	5.25	CONFINED
			11/17/2011	NR	0.01	BDT	AQWIN/SSR	404.44	19.40	6.89	CONFINED
			11/18/2013	NR	0.04	BDT	API	400.57	13.38	6.07	CONFINED
RB-29	LNAPL_District_6	North Olive	6/18/2003	NR	0.69	BDT	AQWIN	418.71	0.53	0.53	UNCONFINED
RB-48	LNAPL_District_3	Main Shallow	6/18/2003	SPR	3.31	BDT	AQWIN	402.93	1.92	1.92	UNCONFINED
			3/2/2006	SPR	2.59	BDT	AQWIN	399.62	3.28	3.28	UNCONFINED
			11/8/2010	SPR	--	INS	--	408.02	--	0.00	UNCONFINED
			12/8/2011	SPR	--	INS	--	405.63	--	0.00	UNCONFINED
			9/25/2012	SPR	2.82	BDT	API	402.00	3.52	3.52	UNCONFINED
			11/14/2013	NR	0.56	BDT	API	402.56	1.36	1.36	UNCONFINED
			7/1/2015	NR	--	INS	--	408.64	0.05	0.05	UNCONFINED
RB-52	LNAPL_District_1B	Main Shallow	6/16/2003	NR	0.12	BDT	AQWIN	401.33	1.89	1.89	UNCONFINED
			11/21/2013	NR	< 0.1 est.	BDT	API	399.99	4.59	4.59	UNCONFINED
			7/9/2015	NR	< 0.1 est.	BDT	API	409.58	3.61	DEQ	CONFINED
			11/1/2016	NR	0.32	RT	OWR	405.27	0.18	DEQ	CONFINED
RB-53	LNAPL_District_1A	EPA/Main	11/17/2006	SPR	2.22	BDT	AQWIN	394.68	2.48	2.48	UNCONFINED
			11/12/2013	SPR	< 0.1 est.	BDT	API	398.14	0.66	0.66	UNCONFINED
RB-55	LNAPL_District_4	EPA	6/17/2003	NR	8.94	BDT	API	402.65	6.72	2.39	CONFINED
			3/1/2006	SPR	12.86	BDT	API	399.06	4.19	4.01	CONFINED
			11/9/2010	SPR	5.17	BDT	API	408.03	14.57	3.13	CONFINED
			10/11/2011	SPR	3.88	BDT	API	407.96	14.30	2.99	CONFINED
			9/11/2012	SPR	2.66	BDT	API	401.52	6.35	3.23	CONFINED
			10/7/2013	SPR	2.30	BDT	API	402.83	8.05	3.25	CONFINED
			10/16/2014	SPR	5.20	BDT	API	405.60	11.36	3.06	CONFINED
			7/6/2015	MICE	5.28	BDT	API	407.11	12.67	2.57	CONFINED
			10/27/2016	NR	0.33	RT	OWR	407.57	13.38	2.67	CONFINED
RB-56	LNAPL_District_1A	EPA/Main	6/17/2003	SPR	--	BDT	--	400.68	3.60	1.23	CONFINED
			12/14/2006	SPR	3.92	BDT	AQWIN	395.44	2.75	2.75	UNCONFINED
			12/2/2010	SPR	--	INS	--	403.54	0.01	DEQ	CONFINED
			11/11/2011	NR	--	INS	--	403.27	0.04	DEQ	CONFINED
			10/1/2012	NR	--	INS	--	398.63	0.16	0.16	UNCONFINED
			11/22/2013	NR	--	INS	--	398.29	0.01	0.01	UNCONFINED
			11/5/2014	NR	--	INS	--	404.34	0.01	DEQ	CONFINED
			7/1/2015	NR	--	INS	--	406.21	--	0.00	CONFINED
			10/4/2016	NR	--	INS	--	426.15	--	0.00	CONFINED
RDPE-01	LNAPL_District_1A	EPA	7/14/2015	LFDPE	0.02	RT	OWR	409.40	7.07	DEQ	CONFINED
RDPE-01CW	LNAPL_District_1A	EPA	12/2/2010	LFDPE	--	INS	--	403.92	--	0.00	CONFINED
			11/8/2011	LFDPE	0.13	BDT	AQWIN/SSR	401.12	2.56	0.18	CONFINED
			10/1/2012	LFDPE	--	INS	--	397.08	--	0.00	UNCONFINED
			11/22/2013	LFDPE	--	INS	--	396.87	--	0.00	UNCONFINED
			11/5/2014	LFDPE	--	INS	--	399.71	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	405.66	0.16	DEQ	CONFINED
			10/4/2016	LFDPE	--	INS	--	405.29	0.02	DEQ	CONFINED
RDPE-02	LNAPL_District_1A	Main Shallow	7/14/2015	LFDPE	0.001	RT	OWR	409.59	2.84	DEQ	CONFINED
RDPE-02CW	LNAPL_District_1A	Main Shallow	10/2/2010	LFDPE	8.35	BDT	AQWIN/SSR	405.74	9.33	1.04	CONFINED
			11/8/2011	LFDPE	0.96	BDT	AQWIN/SSR	401.72	2.98	0.10	CONFINED
			10/1/2012	LFDPE	--	INS	--	398.05	--	0.00	UNCONFINED
			6/12/2013	LFDPE	0.02	BDT	API	407.88	11.09	0.27	CONFINED
			11/19/2013	LFDPE	--	INS	--	397.72	--	0.00	UNCONFINED
			10/1/2014	LFDPE	--	INS	--	402.62	0.05	DEQ	CONFINED
			7/1/2015	LFDPE	--	INS	--	407.02	0.72	DEQ	CONFINED
			10/27/2016	LFDPE	0.25	RT	OWR	404.45	6.67	0.25	CONFINED
RDPE-03CW	LNAPL_District_1A	Main Shallow	10/20/2010	LFDPE	6.95	BDT	AQWIN/SSR	406.28	9.46	0.20	CONFINED
			11/8/2011	LFDPE	--	INS	--	402.54	3.53	DEQ	CONFINED
			10/1/2012	LFDPE	--	INS	--	397.98	--	0.00	UNCONFINED
			11/19/2013	LFDPE	--	INS	--	398.10	--	0.00	UNCONFINED
			10/1/2014	LFDPE	--	INS	--	402.30	0.09	DEQ	CONFINED
			7/15/2015	LFDPE	0.10	RT	OWR	408.59	4.82	DEQ	CONFINED
			10/4/2016	LFDPE	--	INS	--	425.31	--	0.00	CONFINED
RDPE-04CW	LNAPL_District_1A	Main Shallow	10/18/2010	LFDPE	4.32	BDT	AQWIN/SSR	406.44	10.68	0.69	CONFINED
			11/2/2011	LFDPE	0.05	BDT	AQWIN/SSR	402.89	5.47	0.18	CONFINED
			10/16/2012	LFDPE	--	INS	--	398.25	--	0.00	UNCONFINED
			11/19/2013	LFDPE	--	INS	--	398.91	--	0.00	CONFINED
			10/1/2014	LFDPE	--	INS	--	402.37	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	407.26	--	0.00	CONFINED
			10/4/2016	LFDPE	--	INS	--	424.91	--	0.00	CONFINED

TABLE 3-4
LNAPL Transmissivity Test Summary Table
Premcor Main Facility

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	LNAPL District	Stratum Screened	Test Date	LNAPL Removal Method	Tn Value (ft2/day)	Test Method	Calculation Method	Corr. GW Elev. (ft msl)	Apparent Thickness (ft)	Est. Mobile NAPL Interface	Conditions
RDPE-05CW	LNAPL_District_1A	Main Shallow	12/2/2010	LFDPE	--	INS	--	403.56	--	0.00	CONFINED
			11/1/2011	LFDPE	--	INS	--	403.10	--	0.00	CONFINED
			10/1/2012	LFDPE	--	INS	--	398.54	--	0.00	CONFINED
			11/19/2013	LFDPE	--	INS	--	398.55	--	0.00	CONFINED
			10/1/2014	LFDPE	--	INS	--	402.51	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	407.33	--	0.00	CONFINED
			10/4/2016	LFDPE	--	INS	--	424.81	--	0.00	CONFINED
RDPE-06CW	LNAPL_District_1A	EPA	12/2/2010	LFDPE	--	INS	--	403.65	--	0.00	CONFINED
			11/8/2011	LFDPE	0.32	BDT	AQWIN/SSR	401.30	6.97	3.14	CONFINED
			10/16/2012	LFDPE	--	INS	--	397.09	--	0.00	UNCONFINED
			11/19/2013	LFDPE	--	INS	--	397.63	--	0.00	UNCONFINED
			11/5/2014	LFDPE	--	INS	--	402.32	0.01	DEQ	CONFINED
			7/16/2015	LFDPE	0.30	RT	OWR	408.77	2.52	DEQ	CONFINED
			10/28/2016	LFDPE	0.28	RT	OWR	404.64	2.71	DEQ	CONFINED
RDPE-07CW	LNAPL_District_1A	EPA/Main	10/26/2010	LFDPE	0.03	BDT	AQWIN/SSR	405.74	9.27	0.29	CONFINED
			11/8/2011	LFDPE	--	INS	--	402.91	4.20	DEQ	CONFINED
			10/16/2012	LFDPE	--	INS	--	398.52	--	0.00	UNCONFINED
			11/19/2013	LFDPE	< 0.1 est.	INS	--	398.64	--	0.00	UNCONFINED
			10/1/2014	LFDPE	< 0.1 est.	INS	--	402.29	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	406.89	--	0.00	CONFINED
			11/2/2016	LFDPE	0.002	RT	OWR	404.31	0.01	DEQ	CONFINED
RDPE-08CW	LNAPL_District_1A	EPA	10/27/2010	LFDPE	1.66	BDT	AQWIN/SSR	405.31	9.47	1.08	CONFINED
			11/1/2011	LFDPE	--	INS	INS	400.23	0.02	DEQ	CONFINED
			10/1/2012	LFDPE	--	INS	--	396.72	--	0.00	UNCONFINED
			11/19/2013	LFDPE	--	INS	--	397.29	--	0.00	UNCONFINED
			10/1/2014	LFDPE	--	INS	--	399.81	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	406.53	0.02	DEQ	CONFINED
			11/3/2016	LFDPE	0.0003	RT	--	404.31	0.01	DEQ	CONFINED
RDPE-09CW	LNAPL_District_1A	EPA	11/1/2010	LFDPE	0.04	BDT	--	405.10	1.46	DEQ	CONFINED
			11/9/2011	LFDPE	0.07	BDT	--	401.50	5.13	1.60	CONFINED
			8/30/2012	LFDPE	0.04	BDT	--	398.73	2.83	2.58	CONFINED
			6/10/2013	LFDPE	0.31	BDT	--	406.39	11.19	1.44	CONFINED
			6/13/2013	LFDPE	0.07	BDT	--	407.61	11.46	0.43	CONFINED
			11/19/2013	LFDPE	--	INS	--	397.19	0.03	0.03	UNCONFINED
			10/1/2014	LFDPE	--	INS	--	401.45	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	406.31	0.28	DEQ	CONFINED
			11/2/2016	LFDPE	0.0010	RT	--	404.51	0.67	DEQ	CONFINED
RDPE-10CW	LNAPL_District_1A	EPA	12/2/2010	LFDPE	--	INS	--	403.50	--	0.00	CONFINED
			11/7/2011	LFDPE	0.02	BDT	--	400.92	7.46	2.80	CONFINED
			10/16/2012	LFDPE	--	INS	--	395.91	0.42	0.42	UNCONFINED
			11/19/2013	LFDPE	--	INS	--	395.64	0.08	0.08	UNCONFINED
			10/1/2014	LFDPE	--	INS	--	399.27	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	405.63	0.13	DEQ	CONFINED
			11/2/2016	LFDPE	0.0003	RT	--	404.68	0.15	DEQ	CONFINED
RDPE-11CW	LNAPL_District_1A	EPA	10/28/2010	LFDPE	0.43	BDT	--	404.81	8.61	1.21	CONFINED
			11/9/2011	LFDPE	0.09	BDT	--	400.66	4.30	1.99	CONFINED
			10/16/2012	LFDPE	--	INS	--	396.72	--	0.00	UNCONFINED
			11/19/2013	LFDPE	--	INS	--	398.09	0.14	0.14	UNCONFINED
			10/1/2014	LFDPE	--	INS	--	399.45	0.10	DEQ	CONFINED
			7/14/2015	LFDPE	0.16	RT	--	408.05	10.28	DEQ	CONFINED
			10/4/2016	LFDPE	--	INS	--	424.56	--	0.00	CONFINED
RDPE-12	LNAPL_District_1A	EPA	7/14/2015	LFDPE	--	RT	--	408.81	--	0.00	CONFINED
RDPE-12CW	LNAPL_District_1A	EPA	12/2/2010	LFDPE	--	INS	--	403.57	--	0.00	CONFINED
			11/3/2011	LFDPE	0.37	BDT	--	400.39	11.93	8.02	CONFINED
			10/17/2012	LFDPE	0.24	BDT	--	393.55	1.16	1.16	UNCONFINED
			6/11/2013	LFDPE	0.31	BDT	--	407.43	10.94	0.20	CONFINED
			11/19/2013	LFDPE	--	INS	--	394.70	0.18	0.18	UNCONFINED
			11/6/2014	LFDPE	0.06	BDT	--	401.75	1.38	DEQ	CONFINED
			11/2/2016	LFDPE	0.0010	RT	--	404.71	0.02	DEQ	CONFINED
RDPE-13	LNAPL_District_1A	EPA	7/15/2015	LFDPE/SPR	0.01	RT	--	407.33	11.96	0.30	CONFINED
RDPE-13CW	LNAPL_District_1A	EPA	12/2/2010	LFDPE	--	INS	--	403.27	--	0.00	CONFINED
			11/1/2011	LFDPE	--	INS	--	403.01	0.04	DEQ	CONFINED
			8/29/2012	LFDPE	0.15	BDT	--	398.41	2.23	1.63	CONFINED
			12/10/2013	LFDPE	0.07	BDT	--	396.88	0.69	0.69	UNCONFINED
			11/6/2014	LFDPE/SPR	--	BDT	--	402.45	2.31	DEQ	CONFINED
			11/1/2016	LFDPE	0.06	RT	--	404.83	0.36	DEQ	CONFINED

SR000235

TABLE 3-4
LNAPL Transmissivity Test Summary Table
Premcor Main Facility

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	LNAPL District	Stratum Screened	Test Date	LNAPL Removal Method	Tn Value (ft2/day)	Test Method	Calculation Method	Corr. GW Elev. (ft msl)	Apparent Thickness (ft)	Est. Mobile NAPL Interface	Conditions
RDPE-14CW	LNAPL_District_1A	EPA	12/2/2010	LFDPE	--	INS	--	403.19	0.03	DEQ	CONFINED
			11/3/2011	LFDPE	0.17	BDT	--	401.61	4.36	DEQ	CONFINED
			8/29/2012	LFDPE	0.20	BDT	--	398.40	1.10	0.26	CONFINED
			11/19/2013	LFDPE	--	INS	--	396.70	--	0.00	UNCONFINED
			10/1/2014	LFDPE	--	INS	--	399.60	--	0.00	CONFINED
			7/1/2015	LFDPE	--	INS	--	403.74	0.01	DEQ	CONFINED
			10/4/2016	LFDPE	--	INS	--	424.17	--	0.00	CONFINED
RMP-14C	LNAPL_District_1B	Main Shallow	7/27/2006	NR	0.06	BDT	--	396.92	7.59	7.00	CONFINED
			8/14/2006	NR	0.02	BDT	--	396.07	6.86	6.86	UNCONFINED
			3/19/2008	PMR	0.06	BDT	--	398.10	6.24	4.77	CONFINED
			9/13/2012	PMR	0.49	BDT	--	398.78	8.77	6.06	CONFINED
			10/24/2013	PMR	0.26	BDT	--	398.77	8.38	5.77	CONFINED
			10/27/2014	PMR	0.49	BDT	--	403.23	11.91	4.06	CONFINED
			7/15/2015	PMR	0.08	RT	--	409.59	0.75	DEQ	CONFINED
			10/31/2016	SPR	2.41	RT	--	402.93	12.14	4.54	CONFINED
RMP-16B	LNAPL_District_1A	EPA	12/1/2016	NR	0.11	RT	--	402.10	1.47	DEQ	CONFINED
RMP-37B	LNAPL_District_1A	EPA	11/11/2010	NR	0.10	BDT	--	404.30	7.78	DEQ	CONFINED
			11/2/2011	NR	0.04	BDT	--	402.54	5.90	DEQ	CONFINED
			10/1/2012	NR	--	INS	--	397.34	0.02	0.02	UNCONFINED
			10/20/2014	NR	0.19	BDT	--	401.22	2.18	DEQ	CONFINED
			7/1/2015	NR	--	INS	--	405.14	--	0.00	CONFINED
			10/25/2016	NR	0.27	RT	--	404.91	0.81	DEQ	CONFINED
RMP-38D	LNAPL_District_2	Main Shallow	11/29/2016	NR	2.40	RT	--	404.62	5.85	1.14	CONFINED
RMW-01C	LNAPL_District_1B	Main Shallow	3/17/2005	PMR	0.01	BDT	--	401.39	7.98	1.83	CONFINED
			3/23/2005	PMR	--	INS	--	401.13	5.31	0.01	CONFINED
			9/9/2012	NR	1.00	BDT	--	398.95	6.45	3.08	CONFINED
			12/4/2013	NR	0.11	BDT	--	399.15	6.79	3.15	CONFINED
			10/29/2014	NR	0.13	BDT	--	403.22	11.17	2.49	CONFINED
			8/18/2015	NR	0.04	BDT	--	406.11	9.44	DEQ	CONFINED
			10/26/2016	SPR	0.01	RT	--	406.49	0.28	DEQ	CONFINED
RMW-02C	LNAPL_District_1A	Main Shallow	11/15/2010	NR	0.01	BDT	--	404.32	7.82	DEQ	CONFINED
			11/11/2011	NR	--	INS	--	403.15	0.49	DEQ	CONFINED
			10/10/2012	NR	0.10	BDT	--	398.38	1.61	DEQ	CONFINED
			11/22/2013	NR	--	INS	--	398.41	0.01	DEQ	CONFINED
			10/28/2014	SPR	--	INS	--	403.14	0.14	DEQ	CONFINED
			7/16/2015	SPR	--	RT	--	409.31	0.06	DEQ	CONFINED
			10/24/2016	NR	0.14	RT	--	404.79	0.39	DEQ	CONFINED
RMW-03B	LNAPL_District_1A	EPA	3/25/2005	NR	0.83	BDT	--	401.01	2.96	2.80	CONFINED
RMW-04B	LNAPL_District_4	EPA	10/1/2013	NR	--	BDT	--	402.74	2.78	DEQ	CONFINED
RMW-07C	LNAPL_District_2	Main Shallow	3/17/2005	NR	19.46	BDT	--	401.10	6.47	1.45	CONFINED
			11/11/2010	SPR	34.74	BDT	--	405.59	11.41	0.81	CONFINED
			10/10/2011	SPR	20.35	BDT	--	406.24	11.85	0.50	CONFINED
			9/6/2012	SPR	2.86	BDT	--	400.51	4.06	0.16	CONFINED
			10/9/2013	MICE	--	BDT	--	401.05	3.98	DEQ	CONFINED
			10/14/2014	MICE	--	BDT	--	403.22	6.42	DEQ	CONFINED
			7/16/2015	MICE	0.0010	RT	--	405.55	6.25	DEQ	CONFINED
			10/28/2016	MICE	3.05	RT	--	404.90	8.81	DEQ	CONFINED
RMW-09B	LNAPL_District_4	EPA	3/20/2008	NR	0.08	BDT	--	396.80	1.88	1.88	UNCONFINED
			6/9/2011	NR	< 0.1 est.	BDT	--	408.95	14.00	0.27	CONFINED
			8/20/2015	NR	< 0.1 est.	BDT	--	404.71	8.50	0.22	CONFINED
RMW-103A	LNAPL_District_2	Main Shallow	9/18/2012	NR	< 0.1 est.	BDT	--	399.93	1.60	DEQ	CONFINED
RMW-11C	LNAPL_District_4	Main Shallow	2/14/2008	PMR	1.80	BDT	--	396.74	1.43	1.43	UNCONFINED
			10/1/2012	NR	--	INS	--	415.49	--	0.00	CONFINED
			8/25/2015	NR	< 0.1 est.	BDT	--	404.71	4.52	DEQ	CONFINED
RMW-15C	LNAPL_District_4	EPA/Main	3/15/2005	NR	3.24	BDT	--	401.78	15.11	10.01	CONFINED
			11/11/2010	SPR	--	INS	--	404.47	14.29	6.68	CONFINED
RMW-20A	LNAPL_District_3	Main Silt	11/10/2010	SPR	0.20	BDT	--	407.56	2.29	2.29	UNCONFINED
			9/25/2012	SPR	3.41	BDT	--	401.72	3.29	3.29	UNCONFINED
			11/20/2013	NR	1.10	BDT	--	402.13	2.69	2.69	UNCONFINED
			10/23/2014	SPR	0.10	BDT	--	405.89	0.81	0.81	UNCONFINED
			7/17/2015	SPR	0.72	RT	--	409.93	3.24	3.24	UNCONFINED
			8/18/2015	SPR	0.75	BDT	--	407.97	1.23	1.23	UNCONFINED
			11/1/2016	SPR	0.13	RT	--	407.34	0.95	0.95	UNCONFINED
RMW-20B	LNAPL_District_3	Main Shallow	4/5/2005	NR	--	BDT	--	403.01	2.40	2.40	UNCONFINED
			11/17/2006	SPR	6.48	BDT	--	397.63	6.69	6.69	UNCONFINED
			10/12/2011	SPR	--	BDT	--	407.41	2.23	2.23	UNCONFINED
			10/1/2013	NR	--	BDT	--	403.50	1.73	1.73	UNCONFINED

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TABLE 3-4
LNAPL Transmissivity Test Summary Table
Premcor Main Facility

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	LNAPL District	Stratum Screened	Test Date	LNAPL Removal Method	Tn Value (ft2/day)	Test Method	Calculation Method	Corr. GW Elev. (ft msl)	Apparent Thickness (ft)	Est. Mobile NAPL Interface	Conditions
RMW-21B	LNAPL_District_3	Main Shallow	11/8/2010	SPR	--	INS	--	407.89	--	0.00	UNCONFINED
			11/17/2010	SPR	--	INS	--	407.22	--	0.00	UNCONFINED
			12/8/2011	SPR	--	INS	--	405.50	--	0.00	UNCONFINED
			9/25/2012	SPR	1.35	BDT	--	401.96	4.47	4.47	UNCONFINED
			11/13/2013	SPR	0.51	BDT	--	402.43	2.92	2.92	UNCONFINED
			7/1/2015	SPR	--	INS	--	408.59	--	0.00	UNCONFINED
RMW-23A	LNAPL_District_3	Main Shallow	11/15/2006	NR	0.08	BDT	--	398.72	2.99	1.11	CONFINED
			10/1/2011	NR	--	INS	--	403.83	0.36	DEQ	CONFINED
			11/3/2016	NR	0.0010	RT	--	407.82	0.24	DEQ	CONFINED
RMW-24C	LNAPL_District_1A	EPA/Main	3/30/2005	NR	0.14	BDT	--	401.07	5.56	3.77	CONFINED
RMW-28B	LNAPL_District_1A	EPA	3/30/2005	NR	0.25	BDT	--	400.82	8.52	DEQ	CONFINED
			9/19/2012	PMR	0.12	BDT	--	399.12	3.80	DEQ	CONFINED
			10/28/2013	PMR	0.04	BDT	--	398.52	9.37	2.59	CONFINED
			10/26/2016	SPR	0.05	RT	--	405.21	9.68	DEQ	CONFINED
RMW-31B	LNAPL_District_4	Main Shallow	3/16/2005	NR	0.34	BDT	--	399.78	4.48	DEQ	CONFINED
			11/15/2012	PMR	2.01	BDT	--	399.15	4.97	0.33	CONFINED
			11/6/2013	PMR	--	BDT	--	399.53	4.17	DEQ	CONFINED
			10/28/2014	PMR	0.09	BDT	--	402.64	2.61	DEQ	CONFINED
RMW-32B	LNAPL_District_4	Main Shallow	3/26/2007	PMR	2.31	BDT	--	395.39	3.66	1.76	CONFINED
			11/17/2011	PMR	0.27	BDT	--	404.03	2.83	DEQ	CONFINED
RMW-38A	LNAPL_District_5	Main Below D Clay	3/1/2006	SPR	0.52	BDT	--	395.43	12.44	2.17	CONFINED
			3/20/2006	SPR	0.23	BDT	--	395.45	12.23	1.99	CONFINED
			11/9/2010	SPR	0.11	BDT	--	404.22	2.74	DEQ	CONFINED
			11/11/2011	SPR	--	--	--	403.11	1.61	DEQ	CONFINED
			10/24/2012	SPR	--	BDT	--	398.34	0.85	DEQ	CONFINED
			10/8/2013	SPR	0.35	BDT	--	397.50	15.88	2.79	CONFINED
			10/22/2014	SPR	0.47	BDT	--	400.82	20.84	3.34	CONFINED
			7/7/2015	SPR	0.29	BDT	--	405.26	25.95	2.88	CONFINED
			7/14/2015	SPR	0.07	RT	--	407.04	26.40	1.45	CONFINED
			10/25/2016	SPR	0.28	RT	--	402.28	21.60	2.47	CONFINED
RMW-42B	LNAPL_District_1A	EPA	12/8/2008	NR	2.39	BDT	--	400.53	4.35	0.36	CONFINED
			11/2/2010	NR	0.43	BDT	--	405.27	10.61	0.51	CONFINED
			10/17/2011	NR	0.28	BDT	--	403.34	9.20	1.34	CONFINED
			10/1/2012	SPR	--	BDT	--	396.98	1.02	1.02	UNCONFINED
			11/5/2013	SPR	0.34	BDT	--	397.58	0.88	0.61	CONFINED
			10/1/2014	SPR	--	INS	--	401.14	0.23	DEQ	CONFINED
			7/7/2015	NR	< 0.1 est.	BDT	--	406.52	7.25	DEQ	CONFINED
			7/15/2015	NR	0.0003	RT	--	408.43	0.16	DEQ	CONFINED
			10/25/2016	NR	0.32	RT	--	404.75	8.81	DEQ	CONFINED
RMW-45B	LNAPL_District_1A	Main Shallow	11/30/2005	NR	1.04	BDT	--	397.94	1.87	1.87	UNCONFINED
			10/22/2007	SPR	2.16	BDT	--	397.72	1.00	1.00	UNCONFINED
			11/2/2010	NR	6.66	BDT	--	404.64	7.34	1.79	CONFINED
			10/20/2011	NR	0.02	BDT	--	403.49	5.43	1.45	CONFINED
			10/1/2012	NR	--	INS	--	397.97	--	0.00	UNCONFINED
			11/22/2013	NR	--	INS	--	398.17	0.01	0.01	UNCONFINED
			10/1/2014	NR	--	INS	--	402.34	--	0.00	CONFINED
			7/1/2015	NR	--	INS	--	407.18	--	0.00	CONFINED
			10/4/2016	NR	--	INS	--	425.28	--	0.00	CONFINED
RMW-47B	LNAPL_District_1A	EPA	6/19/2008	PMR	0.0012	BDT	--	406.95	9.70	0.02	CONFINED
			10/19/2011	NR	--	--	--	403.74	5.30	DEQ	CONFINED
			10/27/2016	SPR	0.30	RT	--	404.60	0.16	DEQ	CONFINED
RMW-48B	LNAPL_District_1A	Main Shallow	1/20/2006	NR	4.50	BDT	--	396.37	3.06	3.06	UNCONFINED
			3/8/2007	SPR	4.46	BDT	--	396.48	1.01	1.01	UNCONFINED
			11/3/2010	NR	2.53	BDT	--	404.34	7.68	0.95	CONFINED
			11/11/2011	NR	--	--	--	402.59	0.82	DEQ	CONFINED
			10/1/2012	NR	--	INS	--	397.93	--	0.00	UNCONFINED
			11/22/2013	NR	--	INS	--	398.19	0.01	0.01	UNCONFINED
			10/1/2014	NR	--	INS	--	402.12	--	0.00	CONFINED
			7/1/2015	NR	--	INS	--	407.23	--	0.00	CONFINED
			10/4/2016	NR	--	INS	--	427.78	--	0.00	CONFINED
RMW-49B	LNAPL_District_1A	Main Shallow	12/1/2005	NR	2.27	BDT	--	397.93	1.96	1.96	UNCONFINED
			3/19/2007	SPR	--	BDT	--	396.91	0.75	0.75	UNCONFINED
			11/10/2010	SPR	0.10	BDT	--	404.18	7.89	0.97	CONFINED
			11/1/2011	NR	--	INS	--	403.12	--	0.00	CONFINED
			10/1/2012	NR	--	INS	--	398.40	--	0.00	UNCONFINED
			11/22/2013	NR	--	INS	--	398.41	0.01	0.01	UNCONFINED
			10/1/2014	NR	--	INS	--	402.37	--	0.00	CONFINED
			7/1/2015	NR	--	INS	--	407.26	--	0.00	CONFINED

TABLE 3-4
LNAPL Transmissivity Test Summary Table
Premcor Main Facility

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	LNAPL District	Stratum Screened	Test Date	LNAPL Removal Method	Tn Value (ft2/day)	Test Method	Calculation Method	Corr. GW Elev. (ft msl)	Apparent Thickness (ft)	Est. Mobile NAPL Interface	Conditions
RMW-56A	LNAPL_District_1A	EPA	3/9/2006	NR	--	BDT	--	395.45	2.85	2.85	UNCONFINED
			3/15/2007	NR	2.81	BDT	--	396.47	0.95	0.95	UNCONFINED
			9/5/2012	NR	--	BDT	--	399.02	0.40	0.40	UNCONFINED
			11/22/2013	NR	--	INS	--	398.33	0.07	0.07	UNCONFINED
RMW-57A	LNAPL_District_1A	EPA	11/4/2010	NR	2.03	BDT	--	403.79	7.79	5.29	CONFINED
			11/15/2011	NR	--	INS	--	403.17	0.13	DEQ	CONFINED
			10/29/2012	NR	--	INS	--	397.61	0.01	0.01	UNCONFINED
			11/22/2013	NR	--	INS	--	397.96	0.45	0.45	UNCONFINED
			10/1/2014	NR	--	INS	--	402.03	--	0.00	UNCONFINED
			7/1/2015	NR	--	INS	--	407.40	--	0.00	CONFINED
			11/1/2016	NR	0.11	RT	--	404.32	0.03	DEQ	CONFINED
RMW-59A	LNAPL_District_4	EPA	10/11/2012	NR	0.16	BDT	--	401.38	6.27	2.21	CONFINED
			12/3/2013	NR	0.24	BDT	--	401.89	6.46	1.85	CONFINED
RMW-60B	LNAPL_District_4	EPA	1/19/2009	NR	5.56	BDT	--	402.36	7.12	2.29	CONFINED
			10/12/2011	SPR	1.30	BDT	--	407.97	13.95	2.01	CONFINED
			9/12/2012	SPR	0.39	BDT	--	401.39	5.89	2.30	CONFINED
			10/8/2013	SPR	0.42	BDT	--	402.46	7.41	2.42	CONFINED
			6/29/2015	NR	0.45	BDT	--	404.20	8.85	1.80	CONFINED
			10/27/2016	MICE	0.51	RT	--	407.86	13.52	1.79	CONFINED
RMW-60C	LNAPL_District_5	Main Below D Clay	11/17/2011	NR	--	--	--	405.05	4.64	DEQ	CONFINED
			12/16/2013	NR	< 0.1 est.	BDT	--	399.02	13.81	DEQ	CONFINED
RMW-61A	LNAPL_District_4	EPA	2/6/2007	NR	3.01	BDT	--	397.22	1.83	1.83	UNCONFINED
			10/9/2012	NR	0.03	BDT	--	400.82	4.40	1.61	CONFINED
			12/4/2013	NR	0.07	BDT	--	401.64	5.74	1.84	CONFINED
RMW-64B	LNAPL_District_1A	EPA	11/17/2010	NR	< 0.1 est.	BDT	--	403.30	3.42	0.57	CONFINED
			10/26/2011	NR	0.10	BDT	--	403.53	4.31	1.03	CONFINED
			9/26/2012	NR	0.02	BDT	--	398.23	0.96	0.96	UNCONFINED
			11/22/2013	NR	--	INS	--	398.23	0.06	0.06	UNCONFINED
			10/1/2014	NR	--	INS	--	402.72	--	0.00	CONFINED
			7/1/2015	NR	--	INS	--	407.46	--	0.00	CONFINED
			11/3/2016	NR	0.16	RT	--	404.72	0.15	DEQ	CONFINED
RMW-68B	LNAPL_District_6	B/C Clay Perm Lens	12/4/2008	NR	1.70	BDT	--	407.40	5.42	4.03	CONFINED
			9/24/2012	NR	< 0.1 est.	BDT	--	404.53	1.07	1.07	UNCONFINED
RMW-69B	LNAPL_District_4	EPA	10/24/2011	NR	0.02	BDT	--	406.84	9.72	0.24	CONFINED
RMW-72B	LNAPL_District_1A	EPA	12/12/2006	NR	14.91	BDT	--	395.40	3.79	3.79	UNCONFINED
			11/8/2007	NR	5.57	BDT	--	397.81	0.80	0.80	UNCONFINED
			7/1/2008	NR	--	BDT	--	407.76	7.25	DEQ	CONFINED
			11/4/2010	NR	0.53	BDT	--	404.83	9.49	1.07	CONFINED
			10/11/2011	NR	0.02	BDT	--	403.95	5.68	DEQ	CONFINED
			8/31/2012	NR	--	INS	--	398.32	0.16	0.16	UNCONFINED
			11/22/2013	NR	--	INS	--	398.35	0.01	0.01	UNCONFINED
			10/1/2014	NR	--	INS	--	401.12	0.16	DEQ	CONFINED
			7/1/2015	NR	--	INS	--	404.74	0.13	DEQ	CONFINED
			7/15/2015	NR	0.0010	RT	--	407.49	0.11	DEQ	CONFINED
			10/25/2016	NR	0.38	RT	--	404.75	6.33	DEQ	CONFINED
RMW-81B	LNAPL_District_4	EPA	10/23/2007	NR	2.59	BDT	--	398.35	3.20	3.20	UNCONFINED
			2/18/2008	NR	3.83	BDT	--	397.47	3.40	3.40	UNCONFINED
			11/11/2010	NR	0.22	BDT	--	407.56	13.44	2.22	CONFINED
			11/17/2011	PMR	0.49	BDT	--	406.08	11.75	2.39	CONFINED
			9/13/2012	SPR	0.25	BDT	--	401.54	6.90	3.14	CONFINED
			10/23/2013	PMR	0.29	BDT	--	402.11	6.64	2.37	CONFINED
			10/28/2014	PMR	0.18	BDT	--	406.35	11.40	1.84	CONFINED
			7/8/2015	PMR	0.36	BDT	--	408.56	11.83	DEQ	CONFINED
RMW-82B	LNAPL_District_4	EPA	10/24/2007	NR	0.06	BDT	--	397.52	0.89	0.89	UNCONFINED
			3/12/2008	NR	0.03	BDT	--	396.83	0.48	0.48	UNCONFINED
			11/9/2010	NR	7.16	BDT	--	406.61	11.32	1.22	CONFINED
			10/12/2011	SPR	4.83	BDT	--	406.86	11.01	0.73	CONFINED
			9/12/2012	SPR	1.14	BDT	--	399.61	10.16	7.31	CONFINED
			10/10/2013	SPR	1.42	BDT	--	401.76	4.46	0.72	CONFINED
			7/17/2015	SPR	0.30	RT	--	406.75	5.33	DEQ	CONFINED
RMW-83B	LNAPL_District_4	Main Shallow	3/12/2008	NR	12.33	BDT	--	396.97	2.46	2.46	UNCONFINED
			6/8/2011	SPR	24.38	BDT	--	409.38	14.54	1.46	CONFINED
			10/7/2013	NR	6.69	BDT	--	401.84	4.64	1.28	CONFINED
			10/9/2014	MICE	4.17	BDT	--	403.24	5.50	0.55	CONFINED
			7/6/2015	MICE	4.79	BDT	--	405.13	7.11	DEQ	CONFINED
			9/15/2015	MICE	2.00	BDT	--	404.75	5.50	DEQ	CONFINED
			10/31/2016	MICE	3.83	RT	--	405.67	8.55	0.50	CONFINED

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TABLE 3-4
LNAPL Transmissivity Test Summary Table
Premcor Main Facility

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	LNAPL District	Stratum Screened	Test Date	LNAPL Removal Method	Tn Value (ft2/day)	Test Method	Calculation Method	Corr. GW Elev. (ft msl)	Apparent Thickness (ft)	Est. Mobile NAPL Interface	Conditions
RMW-84B	LNAPL_District_4	EPA	10/23/2007	NR	0.14	BDT	--	397.38	1.92	1.92	UNCONFINED
			2/18/2008	NR	0.04	BDT	--	396.41	2.35	2.35	UNCONFINED
			11/9/2010	NR	3.42	BDT	--	406.95	12.13	1.51	CONFINED
			10/13/2011	NR	1.31	BDT	--	407.21	12.16	1.27	CONFINED
			9/27/2012	NR	1.67	BDT	--	401.03	4.92	1.81	CONFINED
			12/17/2013	NR	2.02	BDT	--	400.43	3.66	1.42	CONFINED
			10/29/2014	NR	1.27	BDT	--	403.79	7.07	0.72	CONFINED
			7/8/2015	NR	0.92	BDT	--	405.04	8.26	0.40	CONFINED
RMW-85B	LNAPL_District_4	EPA	3/3/2008	NR	16.13	BDT	--	398.12	1.76	0.85	CONFINED
			11/16/2010	PMR	0.02	BDT	--	407.68	14.48	1.21	CONFINED
			9/26/2012	SPR	0.30	BDT	--	401.52	7.06	1.59	CONFINED
			10/10/2013	SPR	0.21	BDT	--	402.53	8.23	1.49	CONFINED
			7/17/2015	SPR	1.10	RT	--	408.12	4.43	DEQ	CONFINED
			10/4/2016	SPR		INS	--	425.40		0.00	CONFINED
RMW-86B	LNAPL_District_4	EPA	3/11/2008	NR	4.59	BDT	--	397.30	1.78	0.29	CONFINED
			12/4/2008	NR	--	BDT	--	400.76	3.54	DEQ	CONFINED
			10/1/2012	NR	--	INS	--	400.61	0.08	DEQ	CONFINED
			11/22/2013	NR	--	INS	--	400.39	0.14	DEQ	CONFINED
RMW-87B	LNAPL_District_4	EPA	3/12/2008	NR	2.00	BDT	--	397.68	2.00	0.98	CONFINED
			11/11/2011	NR	--	--	--	405.04	9.79	DEQ	CONFINED
			10/4/2012	NR	1.39	BDT	--	400.56	6.09	1.29	CONFINED
			12/9/2013	NR	1.35	BDT	--	400.49	6.00	1.29	CONFINED
			10/30/2014	NR	0.80	BDT	--	404.23	10.22	0.84	CONFINED
			7/9/2015	NR	0.31	BDT	--	405.90	12.20	0.72	CONFINED
RMW-88A	LNAPL_District_4	EPA	2/12/2008	NR	0.98	BDT	--	398.77	4.30	3.58	CONFINED
			10/20/2011	NR	0.06	BDT	--	407.45	12.48	1.28	CONFINED
			7/1/2015	NR	--	INS	--	405.00	0.20	DEQ	CONFINED
RMW-88B	LNAPL_District_5	Main Below D Clay	2/12/2008	NR	0.02	BDT	--	397.37	0.65	DEQ	CONFINED
			11/11/2011	NR	--	INS	--	404.85	0.28	DEQ	CONFINED
RMW-89B	LNAPL_District_4	Main Shallow	3/5/2008	NR	6.18	BDT	--	397.58	9.75	5.13	CONFINED
			10/18/2011	PMR	0.01	BDT	--	406.75	8.80	DEQ	CONFINED
RMW-90B	LNAPL_District_4	Main Shallow	3/5/2008	NR	6.60	BDT	--	397.54	6.31	0.48	CONFINED
			10/18/2011	SPR	0.17	BDT	--	404.19	17.94	2.90	CONFINED
RMW-91B	LNAPL_District_4	EPA	3/13/2008	NR	0.08	BDT	--	397.05	1.54	1.54	UNCONFINED
			11/8/2010	NR	0.57	BDT	--	407.07	10.96	0.48	CONFINED
			9/20/2012	NR	0.29	BDT	--	401.28	4.81	1.47	CONFINED
			12/5/2013	NR	1.89	BDT	--	400.64	3.55	1.13	CONFINED
			7/9/2015	NR	1.31	BDT	--	404.98	8.17	0.39	CONFINED
			11/2/2016	NR	4.38	RT	--	405.84	9.10	0.26	CONFINED
RMW-93B	LNAPL_District_1A	EPA	12/5/2006	NR	3.20	BDT	--	395.35	3.82	3.82	UNCONFINED
			11/17/2010	NR	0.25	BDT	--	403.66	7.47	0.97	CONFINED
			10/1/2011	NR	--	INS	--	399.20	0.03	DEQ	CONFINED
			10/1/2012	NR	--	INS	--	398.39	--	0.00	UNCONFINED
			10/1/2014	NR	--	INS	--	402.13	--	0.00	CONFINED
			10/4/2016	NR	--	INS	--	424.06	--	0.00	CONFINED
RMW-94B	LNAPL_District_1A	Main Shallow	12/12/2006	NR	0.70	BDT	--	395.53	3.05	3.05	UNCONFINED
			3/5/2007	NR	0.56	BDT	--	396.43	1.37	1.37	UNCONFINED
			11/10/2010	NR	0.13	BDT	--	404.34	7.01	0.33	CONFINED
			11/1/2011	NR	--	--	--	402.56	1.81	DEQ	CONFINED
			10/10/2012	NR	0.18	BDT	--	398.50	2.34	2.34	UNCONFINED
			11/22/2013	NR	--	INS	--	398.45	0.43	0.43	UNCONFINED
			10/1/2014	NR	--	INS	--	402.54	0.21	DEQ	CONFINED
			7/1/2015	NR	--	INS	--	407.03	--	0.00	CONFINED
			10/26/2016	NR	0.59	RT	--	404.90	0.09	DEQ	CONFINED
RMW-97	LNAPL_District_1A	Main Shallow	12/4/2006	NR	4.02	BDT	--	395.37	3.09	3.09	UNCONFINED
RMW-98B	LNAPL_District_1B	Main Silt	2/8/2007	NR	0.11	BDT	--	396.25	1.53	1.53	UNCONFINED
			11/11/2013	PMR	< 0.1 est.	BDT	--	399.61	3.07	3.07	UNCONFINED
			10/26/2016	PMR	0.01	RT	--	406.25	3.42	3.42	UNCONFINED

SR000239

TABLE 3-4
LNAPL Transmissivity Test Summary Table
Premcor Main Facility

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	LNAPL District	Stratum Screened	Test Date	LNAPL Removal Method	Tn Value (ft2/day)	Test Method	Calculation Method	Corr. GW Elev. (ft msl)	Apparent Thickness (ft)	Est. Mobile NAPL Interface	Conditions
RMW-99B	LNAPL_District_2	Main Shallow	10/25/2010	NR	29.56	BDT	--	407.35	13.37	3.48	CONFINED
			11/11/2010	NR	37.05	BDT	--	405.96	11.30	3.25	CONFINED
			10/10/2011	MICE	36.09	BDT	--	406.48	11.58	2.95	CONFINED
			9/5/2012	MICE	24.26	BDT	--	400.86	3.30	2.11	CONFINED
			10/8/2013	MICE	4.87	BDT	--	401.44	3.51	1.70	CONFINED
			10/8/2014	MICE	2.16	BDT	--	402.97	5.09	1.40	CONFINED
			7/7/2015	MICE	0.23	BDT	--	405.22	7.35	0.91	CONFINED
			7/15/2015	MICE	2.80	RT	--	405.85	9.61	2.05	CONFINED
			10/28/2016	MICE	2.30	RT	--	405.28	7.85	1.24	CONFINED
T-01	LNAPL_District_3	Main Shallow	6/18/2003	NR	6.55	BDT	--	403.13	1.56	1.56	UNCONFINED
			11/16/2006	SPR	1.68	BDT	--	398.42	3.46	3.46	UNCONFINED
			3/12/2007	SPR	1.33	BDT	--	399.26	2.49	2.49	UNCONFINED
			11/10/2010	SPR	0.50	BDT	--	407.92	4.22	2.37	CONFINED
			10/25/2011	SPR	0.13	BDT	--	406.97	2.77	2.19	CONFINED
			10/1/2012	SPR	--	INS	--	401.93	--	0.00	UNCONFINED
			12/11/2013	NR	< 0.1 est.	BDT	--	401.93	0.70	0.70	UNCONFINED
			12/10/2014	NR	--	INS	--	403.95	0.48	0.48	UNCONFINED

NOTES:

AQWIN = LNAPL Tn based on geometric mean of values calculated from two or more methods including Cooper et al. (1967) and/or Bouwer and Rice (1976) using the software program WinAquifer32. A Modified Bouwer and Rice Method was also utilized at times using this software for late-time data when the oil/water interface was below the confining layer.

SSR = LNAPL Tn based on the "Sum of Square Residual" or SSR Method by Huntley (2000) and using a spreadsheet developed by A. Kirkman (2010). It is based on the methods from Cooper and Jacob (1946) and Jacob and Lohman (1952).

API = LNAPL Tn based on average of values calculated from various methods using The User Guide from the API LNAPL Transmissivity Workbook: A Tool for Baildown Test Analysis and spreadsheet (Pre-Publication Draft, September 2012). Various methods are utilized to calculate LNAPL Tn depending if the LNAPL is unconfined, confined, or perched.
SPR = Skimmer Pump Recovery
NR = No Recovery
MICE = Mobile ICE
LFDPE = Low Flow Dual Phase Extraction
PMR = Periodic Manual Removal
BDT = Baildown Test
RT = Oil/Water Ratio Test
INS = A transmissivity test was not performed because LNAPL was either not present or there was an insufficient thickness in the well.

TABLE 3-5
Annual LNAPL Skimmer Pump Recovery Volumes

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Existing Recovery Wells	Operating Dates	LNAPL Removal Volume (gallons)[3]						Total Removed (gallons)
		2003-2012	2013	2014	2015	2016	2017[4]	
RB-08P	Jun 03 to Aug 06; May 11 to May 14	3,686	30	0	---	---	---	3,716
RB-10	Jun 03 to Oct 05	83	---	---	---	---	---	83
RB-35/RB-55[1]	Jun 03 to Jun 04	11,655	---	---	---	---	---	11,655
RB-35[2]	Jul 04 to Aug 06	804	---	---	---	---	---	804
RB-37	Oct 03 to Jun 09	915	---	---	---	---	---	915
RB-48	Sep 03 to present	26,564	116	170	335	1	23	27,209
RB-52	Oct 03 to Oct 05; Nov 07 to Apr 09	414	---	---	---	---	---	414
RB-53/SVE-1D[1]	Jun 03 to Jan 05	2,372	---	---	---	---	---	2,372
RB-53	Jul 05 to May 14	12,339	13	6	---	---	---	12,358
RB-55[2]	Jul 04 to Mar 15	84,608	5,762	6,034	856	---	---	97,260
RB-56	Jun 03 to Oct 05; Jan 06 to May 11	6,598	---	---	---	---	---	6,598
T-01	Sep 03 to Sep 12	14,796	---	---	---	---	---	14,796
RDPE-13CW	May 14 to Sep 14	---	---	25	---	---	---	25
RMP-14C	Aug 15 to present	---	---	---	169	433	276	878
RMW-1C	Mar 16 to present	---	---	---	---	40	4	44
RMW-2C	May 14 to Jun 15	---	---	9	3	---	---	12
RMW-3B	Jul 05 to Mar 06	15	---	---	---	---	---	15
RMW-4B	May 14 to Jun 15	---	---	1	0	---	---	1
RMW-7C	Jul 05 to Aug 13	70,758	2,731	---	---	---	---	73,489
RMW-15C	Jul 05 to present	19,520	971	842	605	971	684	23,593
RMW-20A	Feb 06 to Apr 13; Jun 14 to present	12,775	430	1,140	1,425	516	234	16,520
RMW-20B	Oct 06 to Apr 12	26,822	---	---	---	---	---	26,822
RMW-21B	Aug 07 to present	3,481	286	237	298	2	23	4,327
RMW-28B	Jul 05 to Jun 08; May 14 to present	1,257	---	73	132	189	232	1,883
RMW-31B	Jul 05 to Aug 06	181	---	---	---	---	---	181
RMW-38A	Feb 05 to present	4,477	478	833	822	600	574	7,784
RMW-42B	Jun 12 to May 14	51	21	0	---	---	---	72
RMW-45B	Aug 06 to Mar 08; Jul 08 to Sep 10	11,717	---	---	---	---	---	11,717
RMW-47B	Jul 2008 to Sep 10; Mar 16 to present	1,090	---	---	---	10	35	1,135
RMW-48B	Sep 06 to Sep 10	26,605	---	---	---	---	---	26,605
RMW-49B	Aug 06 to Jan 07; Aug 07 to Oct 07; Jul 08 to Apr 12	4,788	---	---	---	---	---	4,788
RMW-59A	May 14 to present	---	---	597	1,411	343	119	2,470
RMW-60B	Feb 09 to Mar 15	13,984	1,948	1,333	308	---	---	17,573
RMW-61A	June 14 to Aug 17	---	---	64	56	26	20	166
RMW-62A	Aug 17 to present	---	---	---	---	---	40	40
RMW-72B	Nov 07 to Jun 08	756	---	---	---	---	---	756
RMW-82B	Mar 11 to present	9,151	204	623	400	172	0	10,550
RMW-83B	Jun 11 to Sep 13	20,007	4,397	---	---	---	---	24,404
RMW-85B	Mar 11 to present	1,745	669	933	498	8	1	3,854
RMW-86B	May 09 to Jun 11	4	---	---	---	---	---	4
RMW-90B	Jun 11 to present	1,007	690	646	777	1,025	776	4,921
RMW-99B	Jul 11 to Feb 12	8,555	---	---	---	---	---	8,555
RPW-01	Mar 06 to May 14	118,564	72	0	---	---	---	118,636
RPW-02	June 13 to present	---	226	503	207	583	42	1,561
SVE-1D	Aug 06 to Oct 06	18	---	---	---	---	---	18
TOTAL GALLONS		**522,162**	**19,044**	**14,069**	**8,302**	**4,919**	**3,083**	**571,579**

NOTES:
(1) = LNAPL from both wells collected in same lube cube.
(2) = On July 16, 2004, a second lube cube was placed in the area of RB-35/RB-55, so that the LNAPL recovery could be tracked separately.
(3) = Low to zero product recovery volumes could be due to sustained confined conditions (i.e., LNAPL in disequilibrium); low LNAPL mobility (i.e., low LNAPL transmissivity); and/or asymptotic conditions.
(4) = Total recovery volumes measured between January 1, 2017 through December 14, 2017.
--- = This recovery technology not being used during this period.

SR000241

TABLE 3-6
Annual LNAPL Periodic Manual Removal Volumes

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Existing Recovery Wells	LNAPL Removal (estimated total gallons)[1]							Total Removed (gallons)
	Operation Dates	2005-2012	2013	2014	2015	2016	2017[3]	
DS-4	March 2006 to April 2008	103	---	---	---	---	---	103
RB-08P*	May 2011	1151	---	---	---	---	---	1,151
RB-10	February 2007 to April 2008	33	---	---	---	---	---	33
RB-35	February 2007 to present	587	40	23	45	38	10	743
RMP-14C	December 2006 to August 2015	2861	143	184	113	---	---	3,301
RMW-1C	May 2005 to April 2007	74	---	---	---	---	---	74
RMW-11C	August 2005 to August 2009	177	---	---	---	---	---	177
RMW-20A	Aug 05 to Feb 06; Jan 08 to Aug 09; Jan 14 to June 14	191	---	21	---	---	---	212
RMW-20B	January 2014 to February 2016	---	---	40	7	0	---	47
RMW-21B	August 2005 to August 2007	558	---	---	---	---	---	558
RMW-24C	May 2005 to June 2014	547	1	1	---	---	---	549
RMW-28B	July 2008 to May 2014	1376	118	54	---	---	---	1,548
RMW-31B	August 2006 to present	1276	69	71	82	67	48	1,613
RMW-32B	August 2005 to present	1419	22	26	29	18	18	1,532
RMW-47B	May 2008 to July 2008	132	---	---	---	---	---	132
RMW-68B	June 2009 to March 2011	30	---	---	---	---	---	30
RMW-81B	March 2011 to present	1630	313	307	242	302	234	3,028
RMW-83B	February 2010 to June 2011	1055	---	---	---	---	---	1,055
RMW-85B	February 2010 to March 2011	1155	---	---	---	---	---	1,155
RMW-89B	October 2009 to present	593	61	59	57	108	59	937
RMW-90B	October 2009 to June 2011	2042	---	---	---	---	---	2,042
RMW-98B	October 2007 to present	874	39	27	24	40	33	1,037
SVE-1D[2]	March 2006 to August 2006	150	---	---	---	---	---	150
		18,014	**806**	**813**	**599**	**573**	**402**	**21,207**

NOTES:
(1) = Weekly vacuum extraction performed by vacuum truck.
(2) = Skimmer Pump installed in well in August 2006 then removed October 2006.
(3) = Total recovery volumes measured between January 1, 2017 through December 14, 2017.
* 30" well. Skimmer Pump installed in well May 2011.
--- = This recovery technology is not being used during this period.

TABLE 4-1

Index of Documents Referenced in Conceptual Site Model

1190500002--Madison County--ILD041889023

The Premcor Refining Group Inc. / Hartford, Illinois

Document Ref. No.	Document Name	Illinois EPA Approval Date	Geology	Hydrogeology	Hydrology	Sources	Migration Pathways	Exposure Routes
1	Current Conditions Report, April 28, 2003	October 7, 2003	X	X		X		X
2	Group 1 Soil Investigation Work Plan, January 17, 2007	July 30, 2007	X	X	X	X	X	
3	Group 1 Soil Investigation Report, May 22, 2008	February 24, 2010	X	X	X	X	X	
4	Group 1 Soil Investigation Addendum and Summary Report, October 22, 2010	February 29, 2012	X	X	X	X	X	
5	Group 2 Soil Investigation Work Plan, June 30, 2008	October 30, 2009	X	X	X	X	X	
6	Group 2 Soil Investigation Report, October 28, 2011	May 22, 2013	X	X	X	X	X	
7	Group 2 Supplemental Soil Investigation Work Plan, August 16, 2013	November 7, 2014	X	X	X	X	X	
8	Group 2 Supplemental Soil Investigation Report, May 21, 2015	November 24, 2015	X	X	X	X	X	
9	Group 3 Soil Investigation Work Plan, August 5, 2010	January 31, 2011	X	X	X	X	X	
10	Group 3 Soil Investigation Report, September 14, 2012	June 30, 2015	X	X	X	X	X	
11	Group 4 Soil Investigation Work Plan, March 20, 2013	September 23, 2013	X	X	X	X	X	
12	Group 4 Soil Investigation Report, July 25, 2014	November 24, 2015	X	X	X	X	X	
13	Site Wide Free Product Investigation Report, January 23, 2006	July 17, 2006				X		
14	Addendum to Site Wide Free Product Investigation Report, May 28, 2009	June 28, 2012				X		
15	Basis of Design Report for Site Wide Management of Free Product, October 26, 2012	February 3, 2015				X		
16	2017 Annual Progress Report, February 27, 2018	No response received or expected					X	
17	Revised Corrective Action Objectives Report - Partial Closure Area Main Facility East, December 7, 2017	Pending completion of Agency review					X	X
18	Corrective Action Objectives Report - Partial Closure Area River Dock Area, December 22, 2017	Pending completion of Agency review					X	X
19	Corrective Action Objectives Report - Partial Closure Area South Property, December 29, 2017	Pending completion of Agency review					X	X
20	Vapor Monitoring Ports Quarterly Monitoring Report, July 6, 2006	No response received or expected					X	

TABLE 4-2
Summary Status of Exposure Route Evaluation

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Area	Media	Exposure Routes				
		Soil Ingestion	GW Ingestion	Outdoor Inhalation	Indoor Air Inhalation	Sediment and Ecological Exposure
PCA Main Facility East	Soil	C	E	C	---	---
	Groundwater	---	E	---	C	---
	Soil Gas	---	---	---	E	---
PCA South Property	Soil	C	E	C	---	---
	Groundwater	---	E	---	C	---
	Soil Gas	---	---	---	E	---
PCA River Dock Area	Soil	C	DN	C	---	---
	Groundwater	---	DN	---	DN	---
	Soil Gas	---	---	---	E	---
Remaining Areas to be Addressed	Soil	C[1]	E	C[1]	---	---
	Groundwater	---	E	---	E	---
	Soil Gas	---	---	---[1]	E[1]	---
Deferred Area	Soil	C[1]	E	C[1]	---	---
	Groundwater	---	E	---	E	---
	Soil Gas	---	---	---[1]	E[1]	---
River Dock Area Sediments	LNAPL	---	---	---	---	DN(AC)
	Sediment	---	---	---	---	DN(T), DN(AC)

Key

C	TACO Tier 1/Tier 2 evaluation completed and CAOs developed
C[1]	TACO Tier 1 evaluation completed
DN	Data needs
E	Exposure route will be excluded
E[1]	Exposure route will be excluded based on additional investigation or building control technology
---	Exposure route not applicable
---[1]	Exposure route will be evaluated using soil data
DN(T)	Data needs for Tier 3 TARPS risk based evaluation
DN(AC)	Data needs for containment/amended capping remedy evaluation

APPENDIX A

REFINERY OWNERSHIP ERA MAPS

A-1 KOCH MAY 1941 – JUNE 30, 1950

A-2 OLD SINCLAIR JULY 1, 1950 – SEPTEMBER 29, 1967

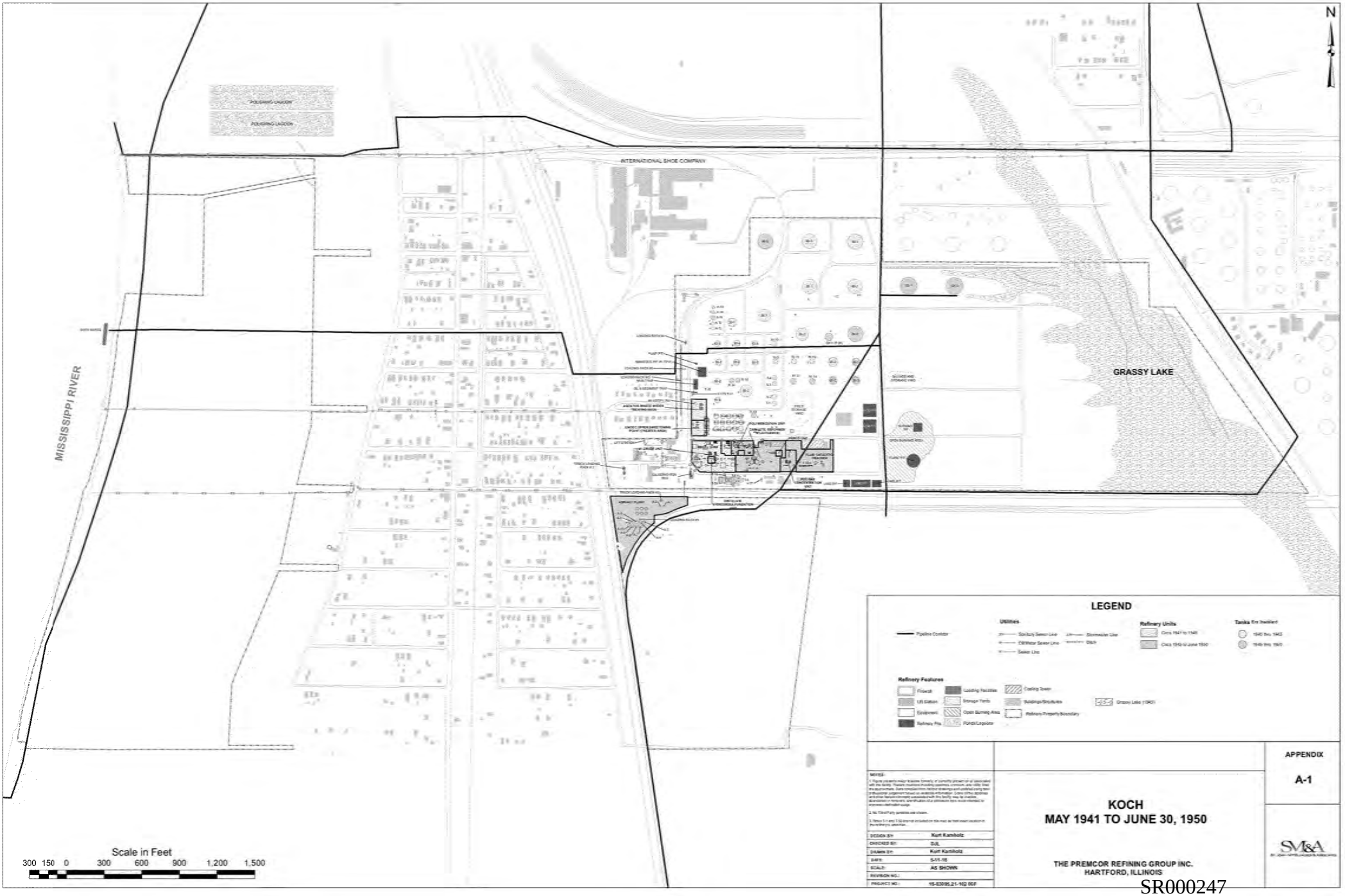
A-3 OLD CLARK (APEX) SEPTEMBER 30, 1967 – NOVEMBER 20, 1988

A-4 NEW CLARK (PREMCOR) NOVEMBER 21, 1988 – SEPTEMBER 28, 2002

A-5 PREMCOR (VTDC AND REMEDIATION) SEPTEMBER 29, 2002 –2017

APPENDIX A-1

KOCH MAY 1941 – JUNE 30, 1950



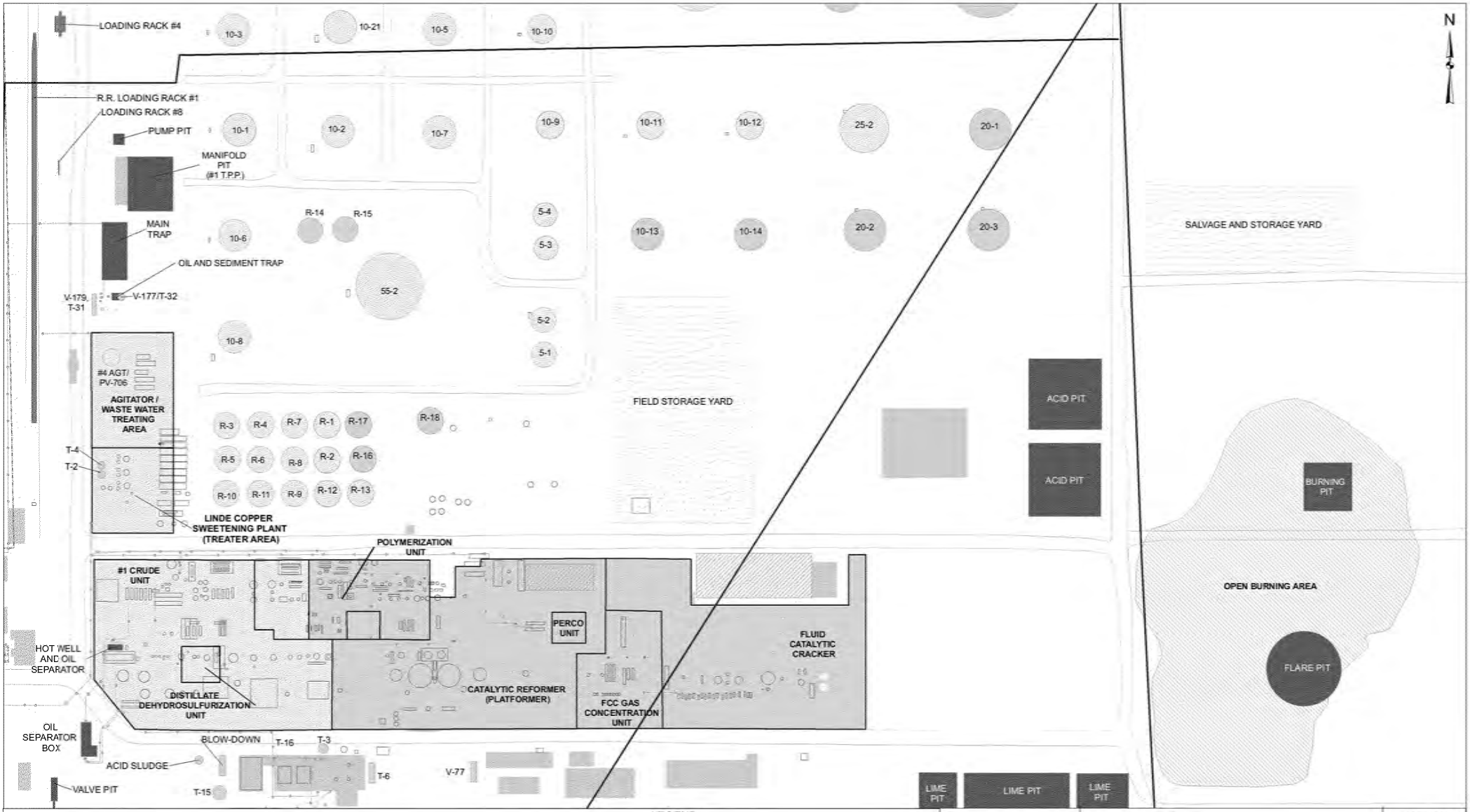
APPENDIX
A-1

KOCH
MAY 1941 TO JUNE 30, 1950

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

DESIGN BY:	Kurt Kamholz
CHECKED BY:	DJL
DRAWN BY:	Kurt Kamholz
DATE:	5-11-15
SCALE:	AS SHOWN
REVISION NO.:	
PROJECT NO.:	15-03095.21-102 00F

SM&A



LEGEND

Utilities

Refinery Units

Refinery Features

Scale in Feet

60 30 0 60 120 180 240 300

NOTES:

DESIGN BY:	Kurt Kamholz
CHECKED BY:	
DRAWN BY:	Kurt Kamholz
DATE:	5-11-18
SCALE:	AS SHOWN
REVISION NO.:	
PROJECT NO.:	15-03095.21-102.90F

KOCH
MAY 1941 TO JUNE 30, 1950

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

APPENDIX

A-1A

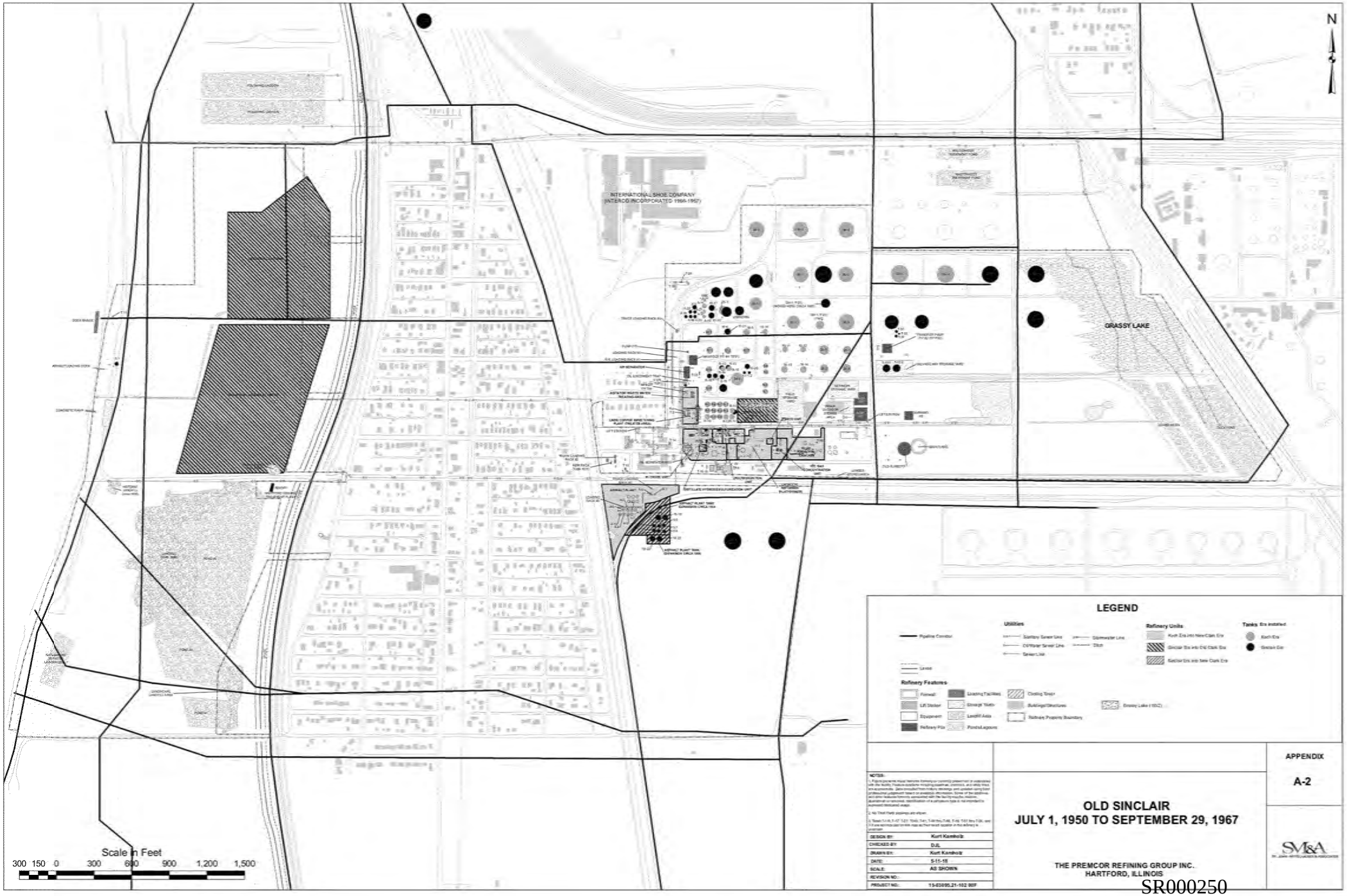
SM&A

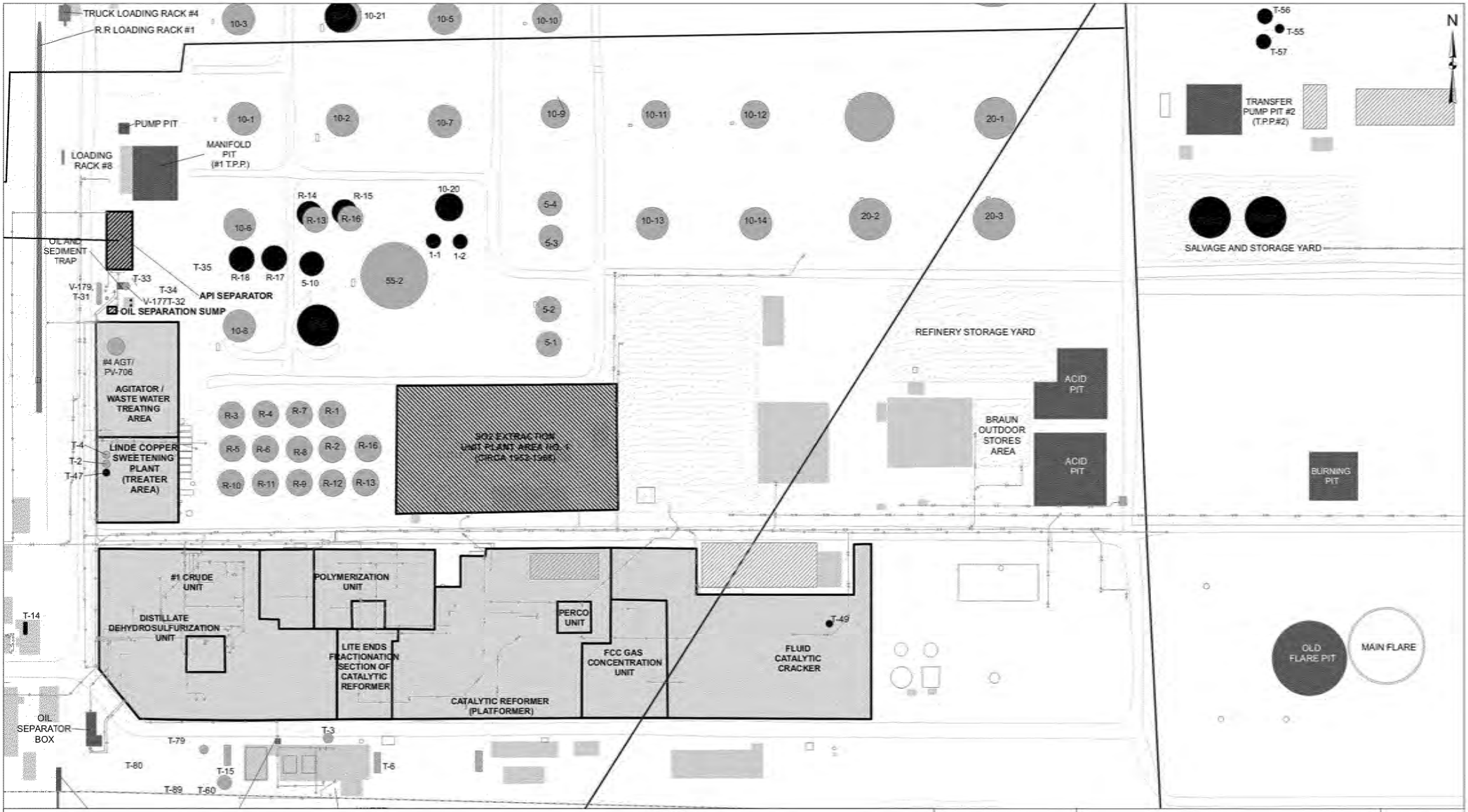
EFILED
Case Number 2003CH000459
Transaction ID: 62059656
Date: May 23 2018 10:07AM
Mark Von Nida
Clerk of Circuit Court
Third Judicial Circuit, Madison County Illinois

ST. JOHN - MITTELHAUSER & ASSOCIATES

APPENDIX A-2

OLD SINCLAIR JULY 1, 1950 – SEPTEMBER 29, 1967


N
INTERNATIONAL SHOE COMPANY
(INTERCO INCORPORATED 1964-1967)
GRASSY LAKE
LEGEND
Utilities
Pipeline Corridor
Sanitary Sewer Line
Oil/Water Sewer Line
Sewer Line
Stormwater Line
Ditch
Levee
Refinery Units
Kerr Era into New Clark Era
Sinclair Era into Old Clark Era
Kerr/Sinclair Era into New Clark Era
Tanks Era installed
Kerr Era
Sinclair Era
Refinery Features
Firewall
Loading Facilities
Cooling Tower
Lift Station
Storage Tanks
Buildings/Structures
Grassy Lake (1952)
Equipment
Landfill Area
Refinery Property Boundary
Refinery Pits
Ponds/Lagoons
NOTES:
DESIGN BY: Kurt Kamholz
CHECKED BY: DJL
DRAWN BY: Kurt Kamholz
DATE: 5-11-15
SCALE: AS SHOWN
REVISION NO.:
PROJECT NO.: 15-03095.21-102.WP
APPENDIX
A-2
OLD SINCLAIR
JULY 1, 1950 TO SEPTEMBER 29, 1967
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
Scale in Feet
300 150 0 300 600 900 1,200 1,500



APPENDIX

A-2A

OLD SINCLAIR
JULY 1, 1950 TO SEPTEMBER 29, 1967

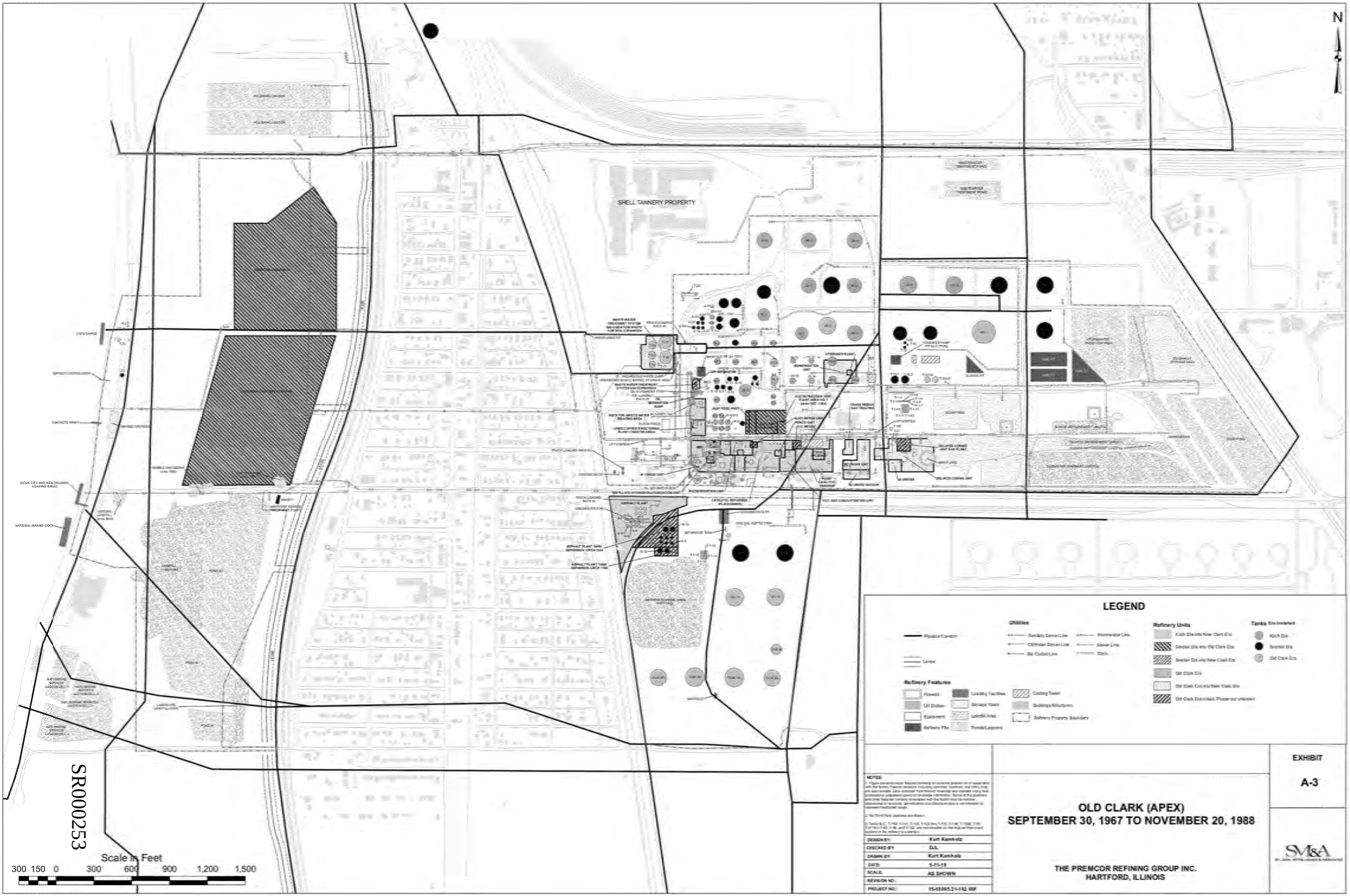
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

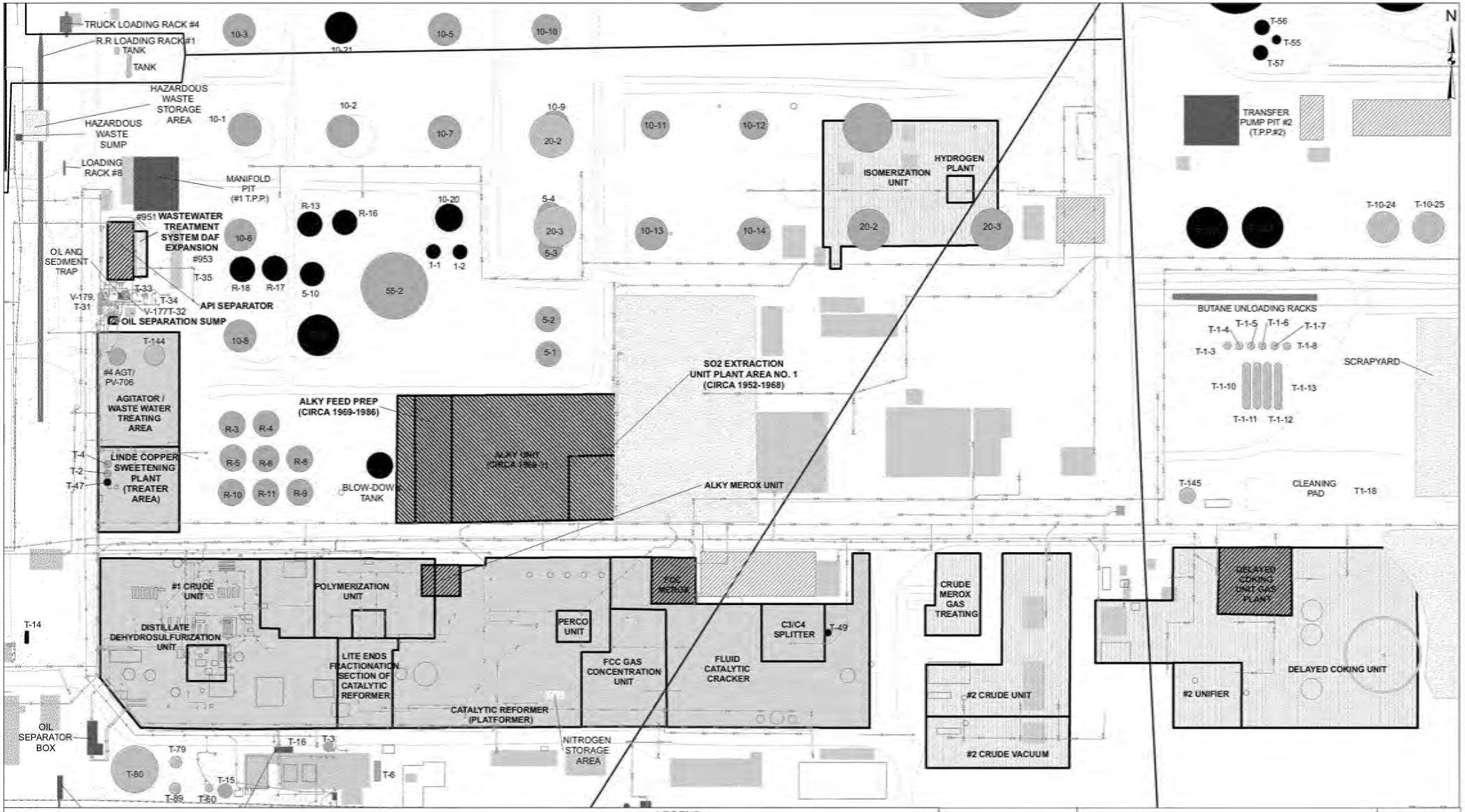
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CHECKED BY:	
DRAWN BY:	Kurt Kamboiz
DATE:	5-11-16
SCALE:	AS SHOWN
REVISION NO.:	
PROJECT NO.:	15-03095.21-102.00F

SM&A

APPENDIX A-3

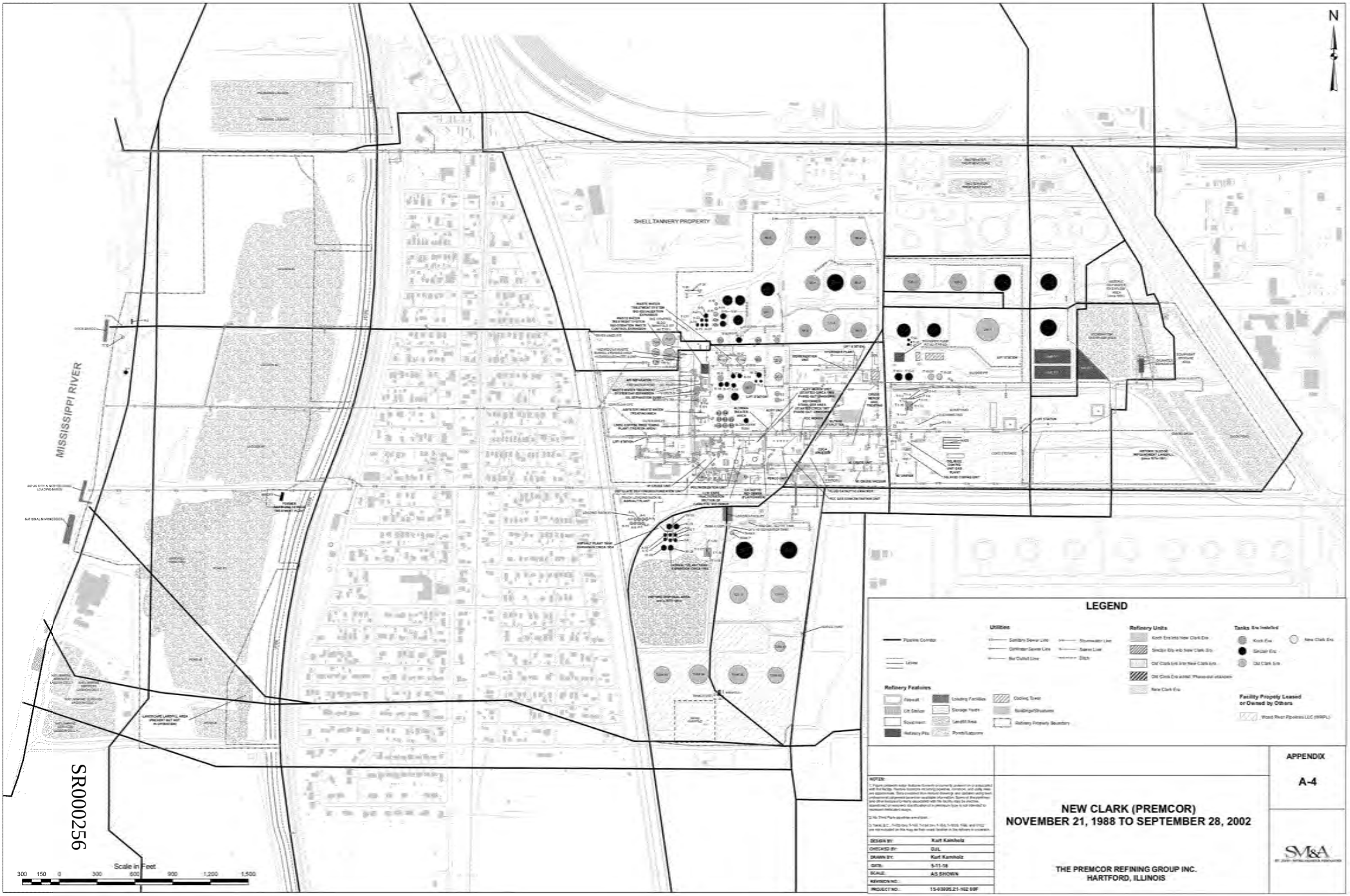
OLD CLARK (APEX) SEPTEMBER 30, 1967 – NOVEMBER 20, 1988


N
SHELL TANNERY PROPERTY
LEGEND
Utilities
Pipeline/Corridor
Sanitary Sewer Line
Stormwater Line
Oil/Water Sewer Line
Sewer Line
Slip Outfall Line
Ditch
Levee
Refinery Units
Kuch Era into New Clark Era
Sinclair Era into Old Clark Era
Sinclair Era into New Clark Era
Old Clark Era
Old Clark Era into New Clark Era
Old Clark Era intact, Phase out unknown
Tanks Era Installed
Kuch Era
Sinclair Era
Old Clark Era
Refinery Features
Firewall
Loading Facilities
Cooling Tower
Lift Station
Storage Yards
Buildings/Structures
Easement
Landfill Area
Refinery Property Boundary
Refinery Pits
Ponds/Lagoons
SR000253
Scale in Feet
300 150 0 300 600 900 1,200 1,500
NOTES:
DESIGN BY: Kurt Kamholz
CHECKED BY: DJL
DRAWN BY: Kurt Kamholz
DATE: 5-15-18
SCALE: AS SHOWN
REVISION NO.:
PROJECT NO.: 15-03095.21-102.00F
EXHIBIT
A-3
OLD CLARK (APEX)
SEPTEMBER 30, 1967 TO NOVEMBER 20, 1988
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A

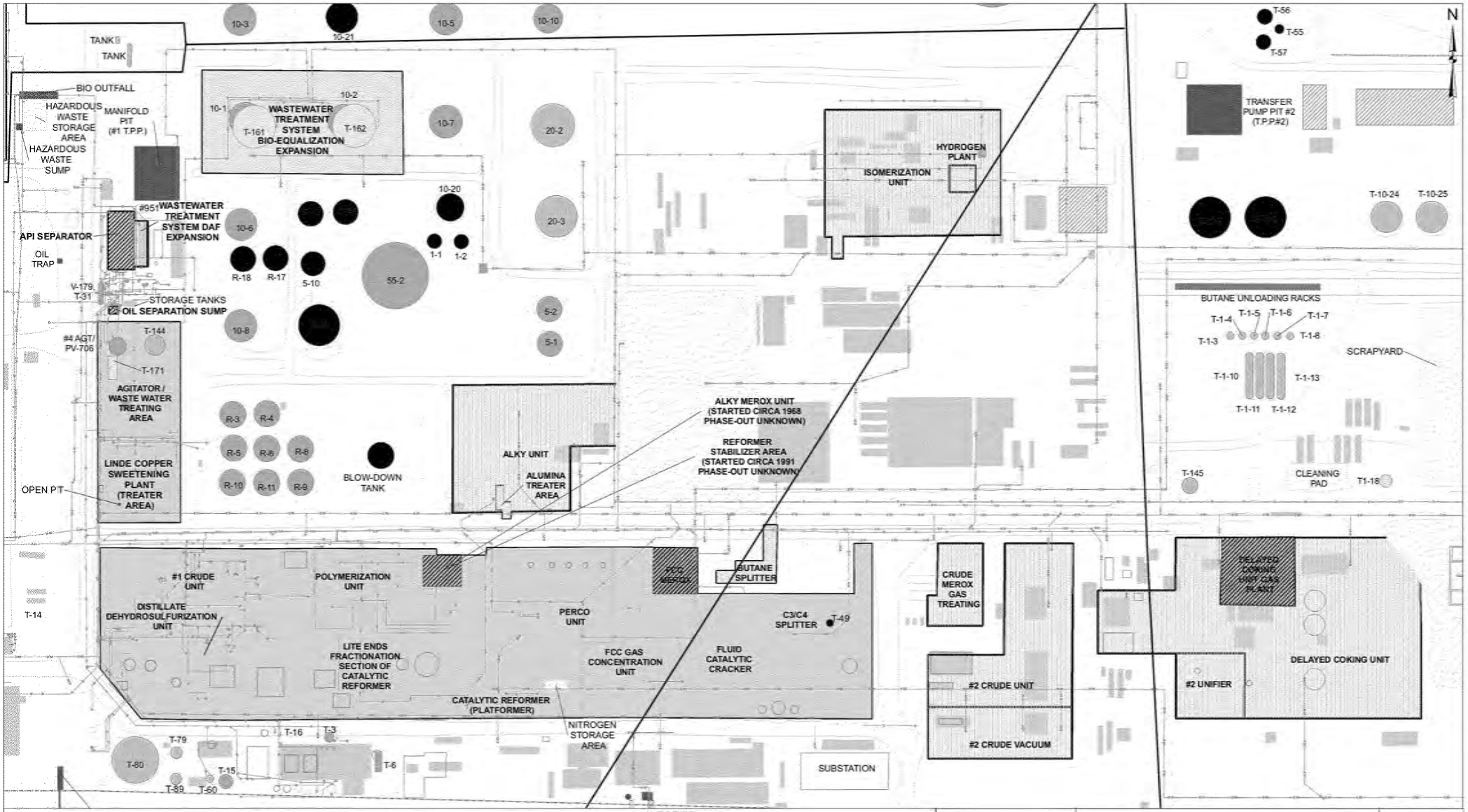

TRUCK LOADING RACK #4
R.R LOADING RACK #1
TANK
TANK
HAZARDOUS WASTE STORAGE AREA
HAZARDOUS WASTE SUMP
LOADING RACK #8
MANIFOLD PIT (#1 T.P.P.)
#951 WASTEWATER TREATMENT SYSTEM DAF EXPANSION
#953
OIL AND SEDIMENT TRAP
API SEPARATOR
OIL SEPARATION SUMP
#4 AGT/ PV-706
AGITATOR / WASTE WATER TREATING AREA
LINDE COPPER SWEETENING PLANT (TREATER AREA)
ALKY FEED PREP (CIRCA 1969-1986)
ALKY UNIT (CIRCA 1969-??)
BLOW-DOWN TANK
SO2 EXTRACTION UNIT PLANT AREA NO. 1 (CIRCA 1952-1968)
ALKY MEROX UNIT
ISOMERIZATION UNIT
HYDROGEN PLANT
TRANSFER PUMP PIT #2 (T.P.P.#2)
BUTANE UNLOADING RACKS
SCRAPYARD
CLEANING PAD
#1 CRUDE UNIT
POLYMERIZATION UNIT
DISTILLATE DEHYDROSULFURIZATION UNIT
LITE ENDS FRACTIONATION SECTION OF CATALYTIC REFORMER
CATALYTIC REFORMER (PLATFORMER)
PERCO UNIT
FCC MEROX
FCC GAS CONCENTRATION UNIT
FLUID CATALYTIC CRACKER
C3/C4 SPLITTER
CRUDE MEROX GAS TREATING
#2 CRUDE UNIT
#2 CRUDE VACUUM
DELAYED COKING UNIT GAS PLANT
DELAYED COKING UNIT
#2 UNIFIER
NITROGEN STORAGE AREA
OIL SEPARATOR BOX
OIL SEPARATOR
N
Scale in Feet
60 30 0 60 120 180 240 300
LEGEND
Utilities
Refinery Units
Tanks
Refinery Features
SR000254
OLD CLARK (APEX)
SEPTEMBER 30, 1967 TO NOVEMBER 20, 1988
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
APPENDIX
A-3A
SM&A

APPENDIX A-4

NEW CLARK (PREMCOR) NOVEMBER 21, 1988 - SEPTEMBER 28, 2002


N
SHELL TANNERY PROPERTY
MISSISSIPPI RIVER
LEGEND
Utilities
Pipeline Corridor
Levee
Sanitary Sewer Line
Stormwater Line
Drinkwater Sewer Line
Sewer Line
Bar Ditch Line
Ditch
Refinery Units
Kosh Ena into New Clark Ena
Sinclair Ena into New Clark Ena
Old Clark Ena into New Clark Ena
Old Clark Ena exited, Phase-out underway
New Clark Ena
Tanks Ena Installed
Kosh Ena
Sinclair Ena
Old Clark Ena
New Clark Ena
Refinery Features
Firewall
Lift Station
Equipment
Refinery Pits
Loading Facilities
Storage Yards
Landfill Area
Ponds/Lagoons
Cooling Tower
Buildings/Structures
Refinery Property Boundary
Facility Property Leased or Owned by Others
Wood River Pipelines LLC (WRPL)
APPENDIX
A-4
NOTES:
DESIGN BY: Kurt Kamholz
CHECKED BY: DJL
DRAWN BY: Kurt Kamholz
DATE: 5-11-16
SCALE: AS SHOWN
REVISION NO.:
PROJECT NO.: 15-03005.21-102 00F
NEW CLARK (PREMCOR)
NOVEMBER 21, 1988 TO SEPTEMBER 28, 2002
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
Scale in Feet
300 150 0 300 600 900 1,200 1,500

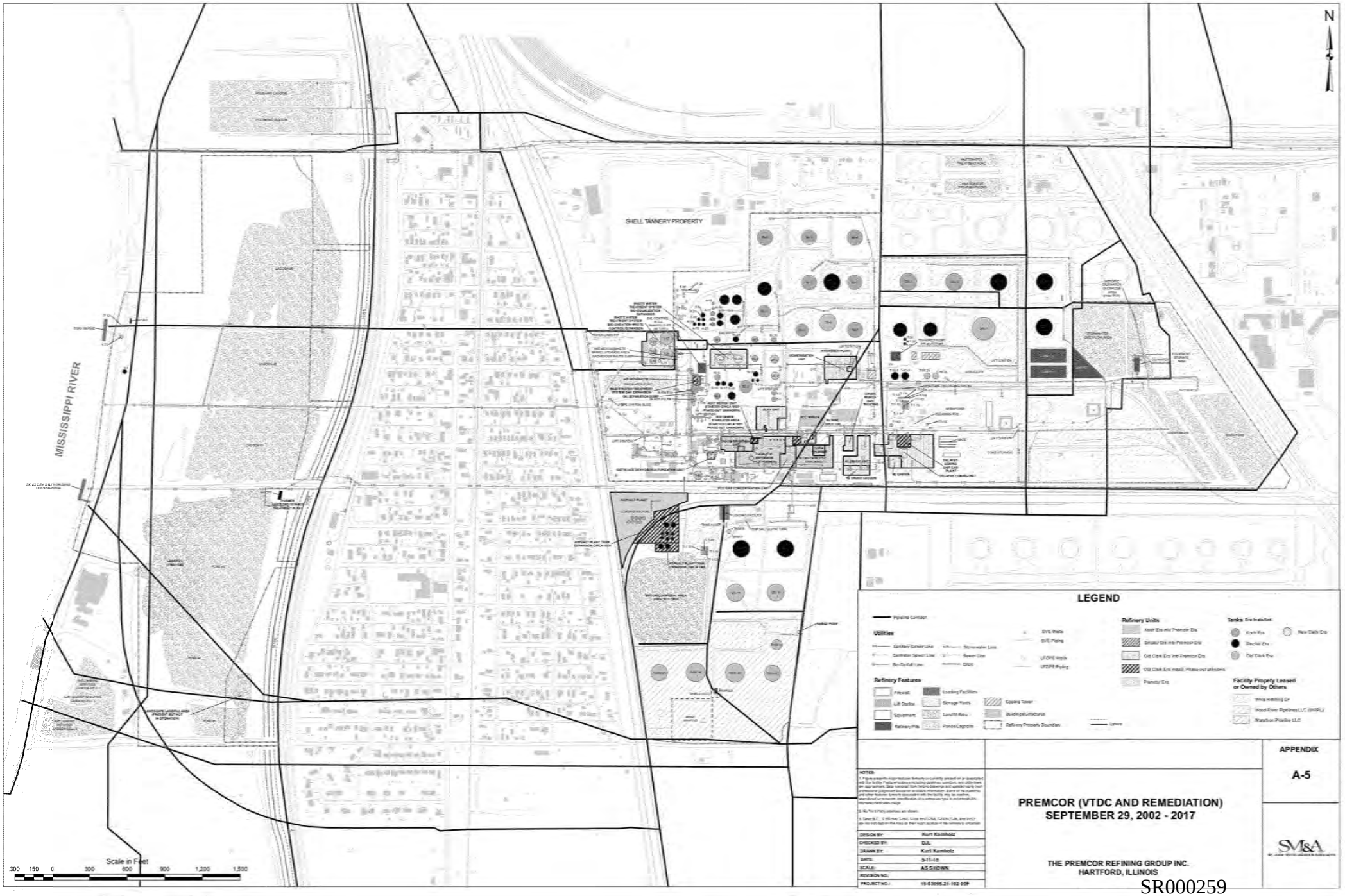
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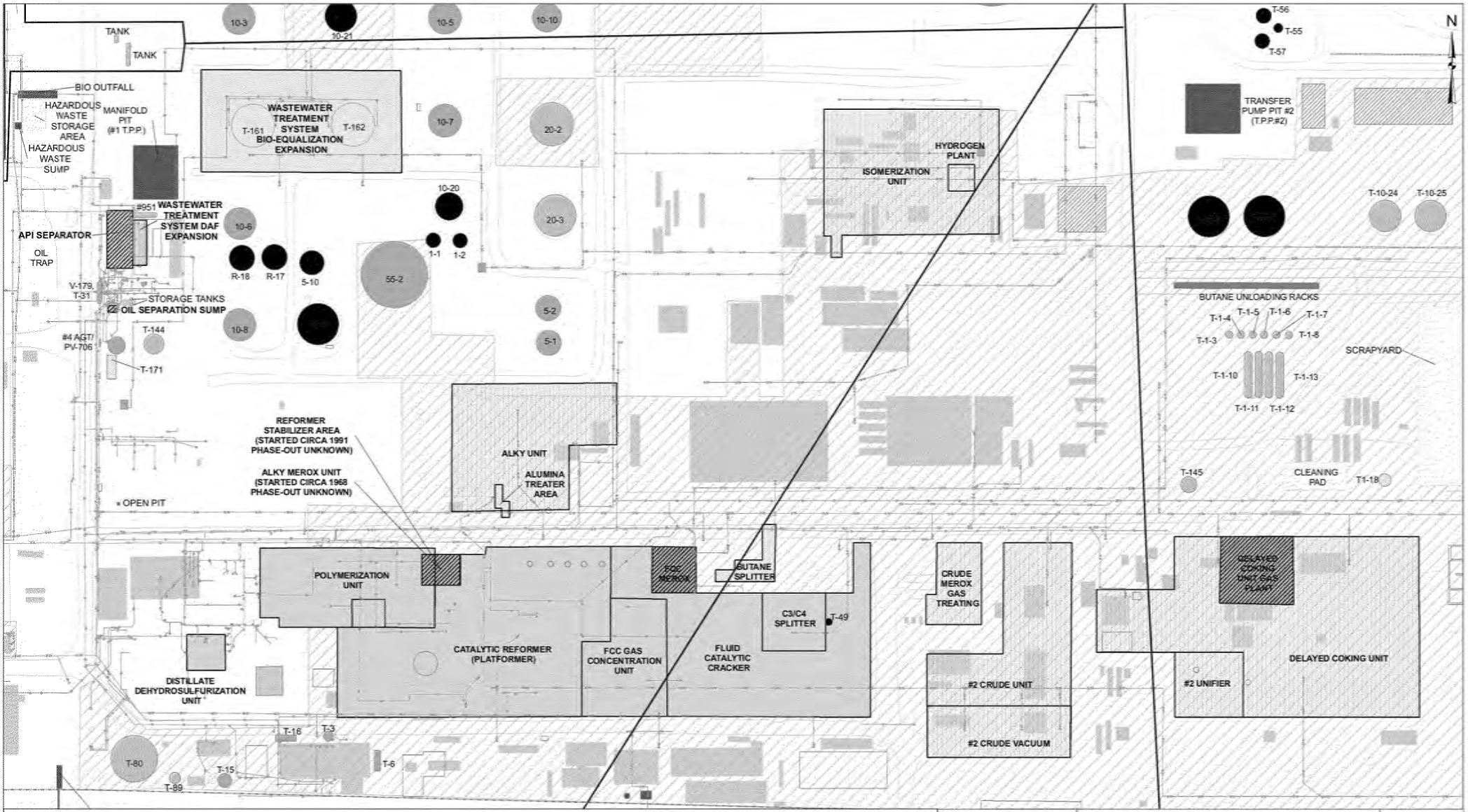

TANK
TANK
BIO OUTFALL
HAZARDOUS WASTE STORAGE AREA
HAZARDOUS WASTE SUMP
MANIFOLD PIT (#1 T.P.P.)
WASTEWATER TREATMENT SYSTEM BIO-EQUALIZATION EXPANSION
T-161
T-162
10-1
10-2
10-3
10-21
10-5
10-10
10-7
20-2
20-3
10-20
1-1
1-2
#951
WASTEWATER TREATMENT SYSTEM DAF EXPANSION
API SEPARATOR
OIL TRAP
10-6
R-18
R-17
5-10
55-2
V-179
T-31
STORAGE TANKS
OIL SEPARATION SUMP
10-8
5-2
5-1
#4 AGT/ PV-706
T-144
T-171
AGITATOR / WASTE WATER TREATING AREA
LINDE COPPER SWEETENING PLANT (TREATER AREA)
OPEN PIT
R-3
R-4
R-5
R-6
R-8
R-10
R-11
R-9
BLOW-DOWN TANK
ALKY UNIT
ALUMINA TREATER AREA
ALKY MEROX UNIT (STARTED CIRCA 1968 PHASE-OUT UNKNOWN)
REFORMER STABILIZER AREA (STARTED CIRCA 1991 PHASE-OUT UNKNOWN)
ISOMERIZATION UNIT
HYDROGEN PLANT
TRANSFER PUMP PIT #2 (T.P.P.#2)
T-56
T-55
T-57
N
T-10-24
T-10-25
BUTANE UNLOADING RACKS
T-1-4
T-1-5
T-1-6
T-1-7
T-1-3
T-1-8
SCRAPYARD
T-1-10
T-1-13
T-1-11
T-1-12
T-145
CLEANING PAD
T1-18
#1 CRUDE UNIT
POLYMERIZATION UNIT
FCC MEROX
BUTANE SPLITTER
DISTILLATE DEHYDROSULFURIZATION UNIT
PERCO UNIT
C3/C4 SPLITTER
T-49
LITE ENDS FRACTIONATION SECTION OF CATALYTIC REFORMER
FCC GAS CONCENTRATION UNIT
FLUID CATALYTIC CRACKER
CATALYTIC REFORMER (PLATFORMER)
CRUDE MEROX GAS TREATING
#2 CRUDE UNIT
#2 CRUDE VACUUM
DELAYED COKING UNIT GAS PLANT
DELAYED COKING UNIT
#2 UNIFIER
T-14
T-79
T-16
T-3
T-80
T-15
T-6
T-89
T-90
NITROGEN STORAGE AREA
SUBSTATION
LEGEND
Scale in Feet
30 0 60 120 180 240 300 360
Utilities
Refinery Units
Tanks By Instrict
Refinery Features
NOTES:
DESIGN BY: Kurt Kamholz
CHECKED BY:
DRAWN BY: Kurt Kamholz
DATE: 5-11-18
SCALE: AS SHOWN
REVISION NO.:
PROJECT NO.: 18-03005.21-102.00F
NEW CLARK (PREMCOR)
NOVEMBER 21, 1988 TO SEPTEMBER 28, 2002
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
APPENDIX
A-4A
SM&A

SR000257

APPENDIX A-5

PREMCOR (VTDC AND REMEDIATION) SEPTEMBER 29, 2002 –2017


N
SHELL TANNERY PROPERTY
MISSISSIPPI RIVER
LEGEND
Pipeline Corridor
Utilities
Sanitary Sewer Line
Stormwater Line
Sewer Line
Ditch
Refinery Features
Firewall
Loading Facilities
Lift Station
Storage Yards
Cooling Tower
Equipment
Landfill Area
Buildings/Structures
Refinery/Pits
Ponds/Lagoons
Refinery Property Boundary
SVE Wells
SVE Piping
UFDPE Wells
UFDPE Piping
Refinery Units
Koch Ete into Premcor Ete
Sinclair Ete into Premcor Ete
Old Clark Ete into Premcor Ete
Old Clark Ete; Insid. Phase-out process
Premcor Ete
Tanks Ete Installed
Koch Ete
New Clark Ete
Sinclair Ete
Old Clark Ete
Facility Property Leased or Owned by Others
WRB Refining LP
Wood River Pipelines LLC (WRPL)
Wabash Pipeline LLC
Scale in Feet
300 150 0 300 600 900 1,200 1,500
APPENDIX
A-5
PREMCOR (VTDC AND REMEDIATION)
SEPTEMBER 29, 2002 - 2017
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
DESIGN BY: Kurt Kamholz
CHECKED BY: DJL
DRAWN BY: Kurt Kamholz
DATE: 5-11-18
SCALE: AS SHOWN
REVISION NO.:
PROJECT NO.: 15-53095.25-102 00F
SM&A



LEGEND

Scale in Feet

60 30 0 60 120 180 240 300

Utilities

Refinery Units

Tanks

Refinery Features

Facility Property Leased or Owned by Others

APPENDIX

A-5A

PREMCOR (VTDC AND REMEDIATION)
SEPTEMBER 29, 2002 - 2017

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

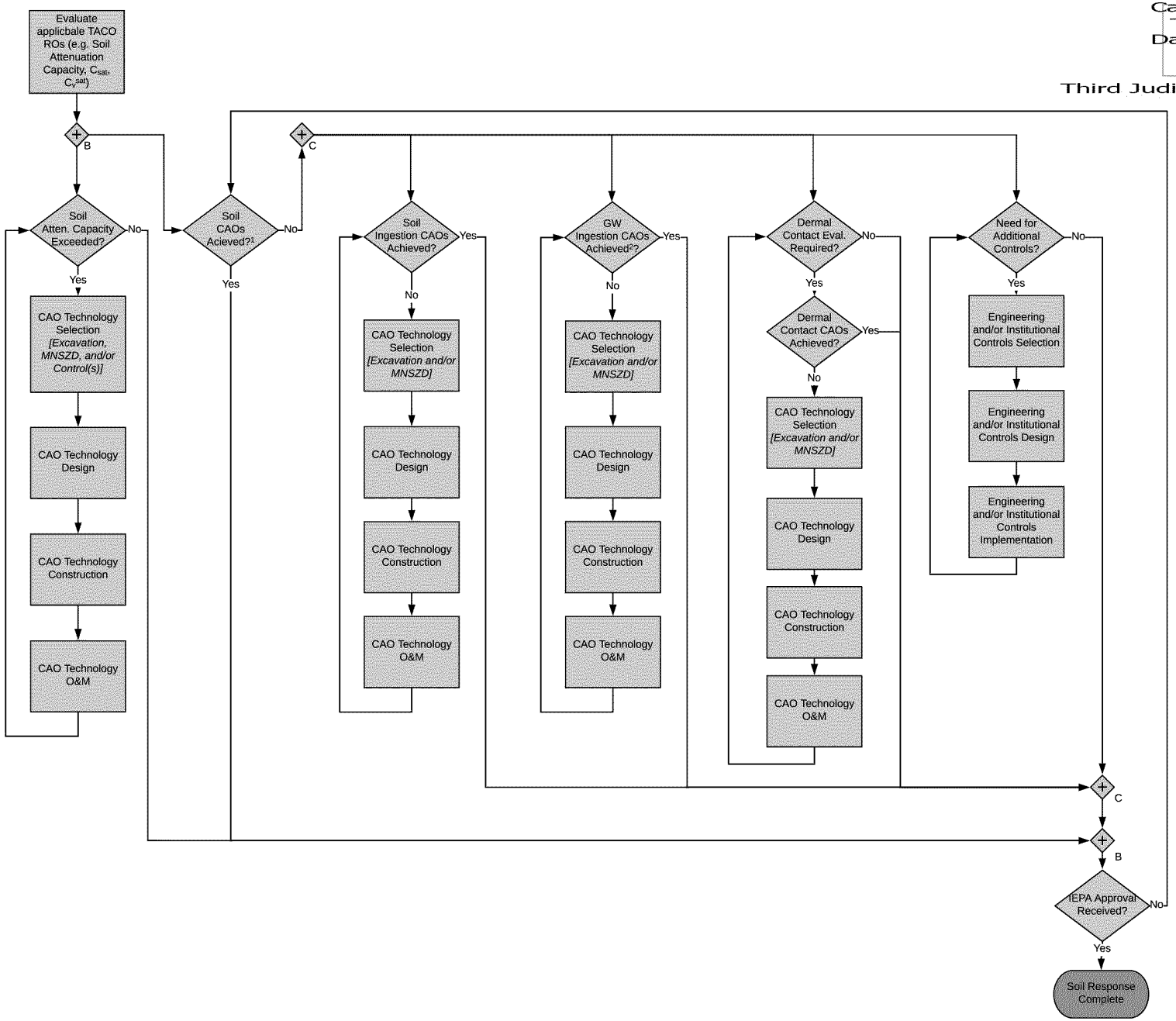
DESIGN BY:	Kurt Kamholz
CHECKED BY:	
DRAWN BY:	Kurt Kamholz
DATE:	5-11-18
SCALE:	AS SHOWN
REVISION NO.:	
PROJECT NO.:	15-03095.21-102.00F

SM&A

APPENDIX B

FIGURES SHOWING LOCATIONS OF AREAS A, C, D, E, H, J, AND L REFERENCED IN ILLINOIS PCB CASE NO. 1995-163

EFILED
Case Number 2003CH000459
Transaction ID: 62059924
Date: May 23 2018 10:29AM
Mark Von Nida
Clerk of Circuit Court
Third Judicial Circuit, Madison County Illinois



Notes:
Additional presumptive remedies added in the future could also be considered to achieve the soil CAOs. The applicability of the additional remedies would be outline in the modification report.

Z - Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

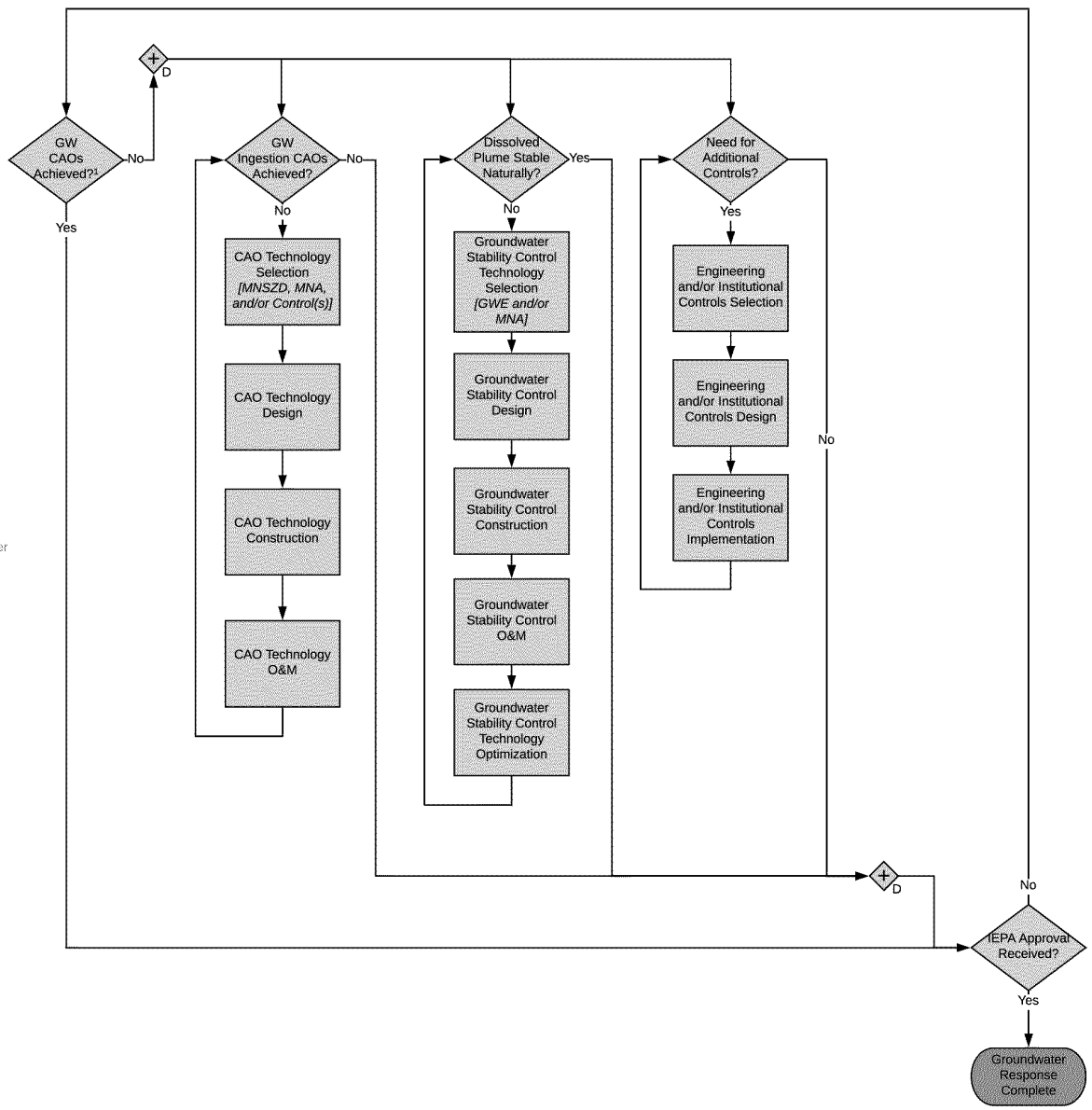
1 - Assumes exposure route will not be excluded and CAOs are established and approved by IEPA per the Strategic Plan (Figure 15).

2 - CAO cannot exceed C_{sat}.

Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
C_{sat} - Soil Saturation Limit
C_v^{sat} - Soil Vapor Saturation Limit
Eval. - Evaluation
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
LNAPL - Light Non-Aqueous Phase Liquid
MNSZD - Monitored Natural Source Zone Depletion
O&M - Operations and Maintenance

DT01: Premcor Hartford Tactical Plan - Dissolved Phase

Assumption: Only chronic (no acute) concerns exist



Notes:
Additional presumptive remedies added in the future could also be considered to achieve the groundwater CAOs. The applicability of the additional remedies would be outline in the modification report.

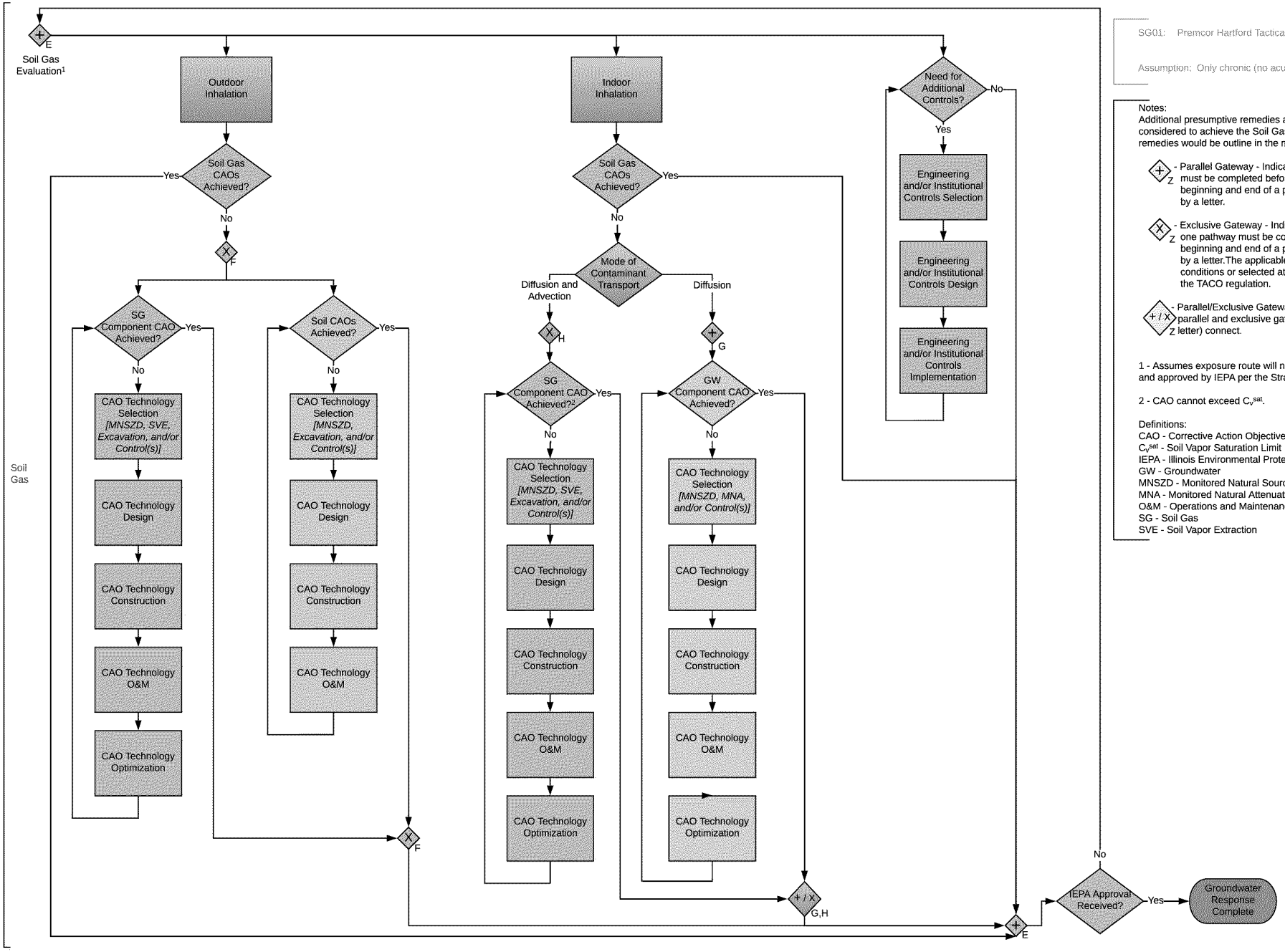
- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Assumes exposure route will not be excluded and CAOs are established and approved by IEPA per the Strategic Plan (Figure 15).

Definitions:
CAO - Corrective Action Objective
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
GWE - Groundwater Extraction
MNA - Monitored Natural Attenuation
MNSZD - Monitored Natural Source Zone Depletion
O&M - Operations and Maintenance

GEI Consultants

SR000263



SG01: Premcor Hartford Tactical Plan - Vapor Phase

Assumption: Only chronic (no acute) concerns exist

Notes:
Additional presumptive remedies added in the future could also be considered to achieve the Soil Gas CAOs. The applicability of the additional remedies would be outline in the modification report.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.
- Exclusive Gateway - Indicates mutually exclusive pathways. Only one pathway must be completed to proceed. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.The applicable pathway may be specified by site conditions or selected at Premcor's discretion as allowable under the TACO regulation.
- Parallel/Exclusive Gateway Termination - Indicates point where parallel and exclusive gateway pathways (each identified by a letter) connect.

1 - Assumes exposure route will not be excluded and CAOs are established and approved by IEPA per the Strategic Plan (Figure 15).

2 - CAO cannot exceed C_v^{sat}.

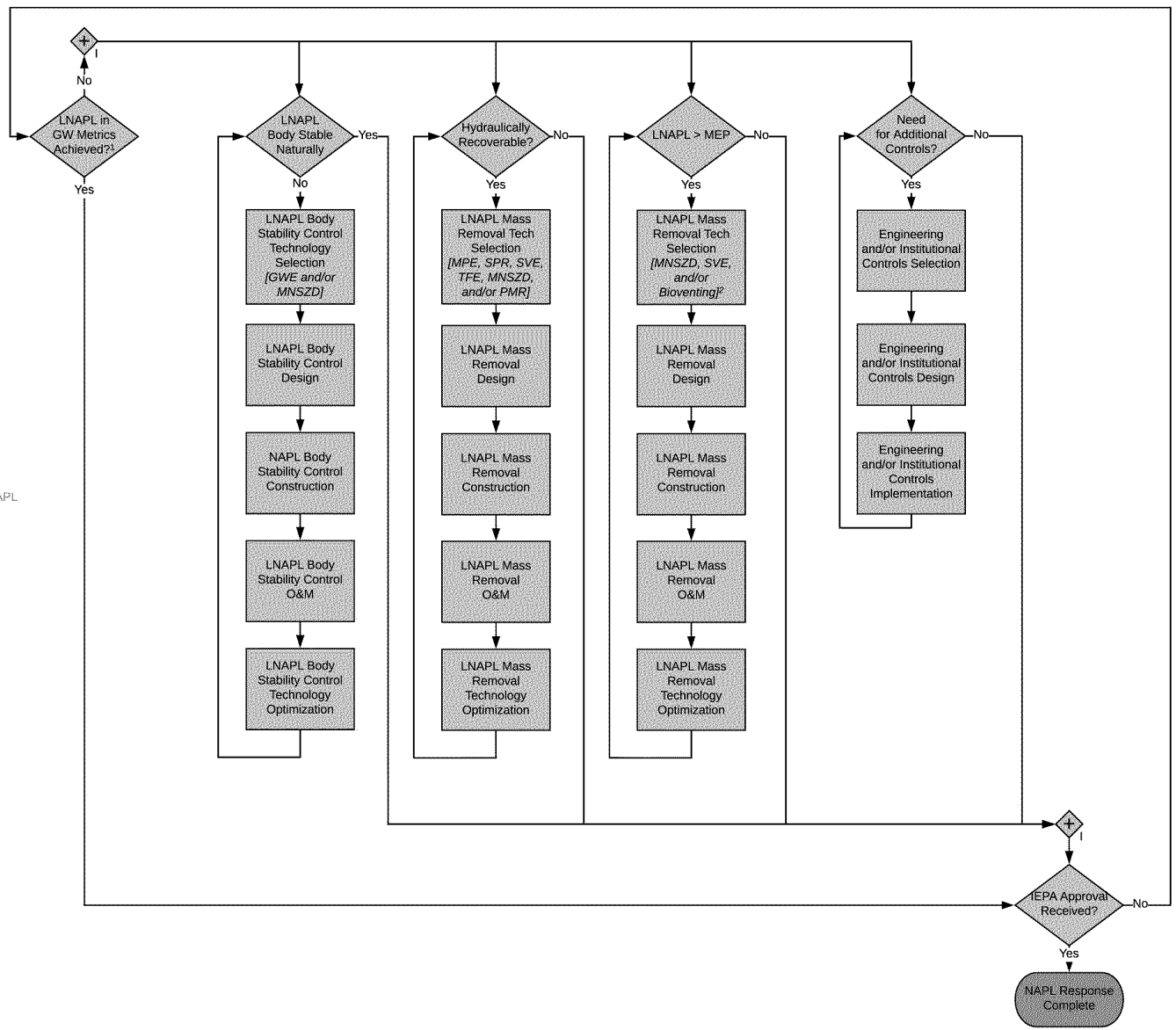
Definitions:
CAO - Corrective Action Objective
C_v^{sat} - Soil Vapor Saturation Limit
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
MNSZD - Monitored Natural Source Zone Depletion
MNA - Monitored Natural Attenuation
O&M - Operations and Maintenance
SG - Soil Gas
SVE - Soil Vapor Extraction

GEI Consultants

SR000264

NT01: Premcor Hartford Tactical Plan - NAPL

Assumption: Only chronic (no acute) concerns exist



Notes:
Additional presumptive remedies added in the future could also be considered to achieve the LNAPL metrics. The applicability of the additional remedies would be outline in the modification report.

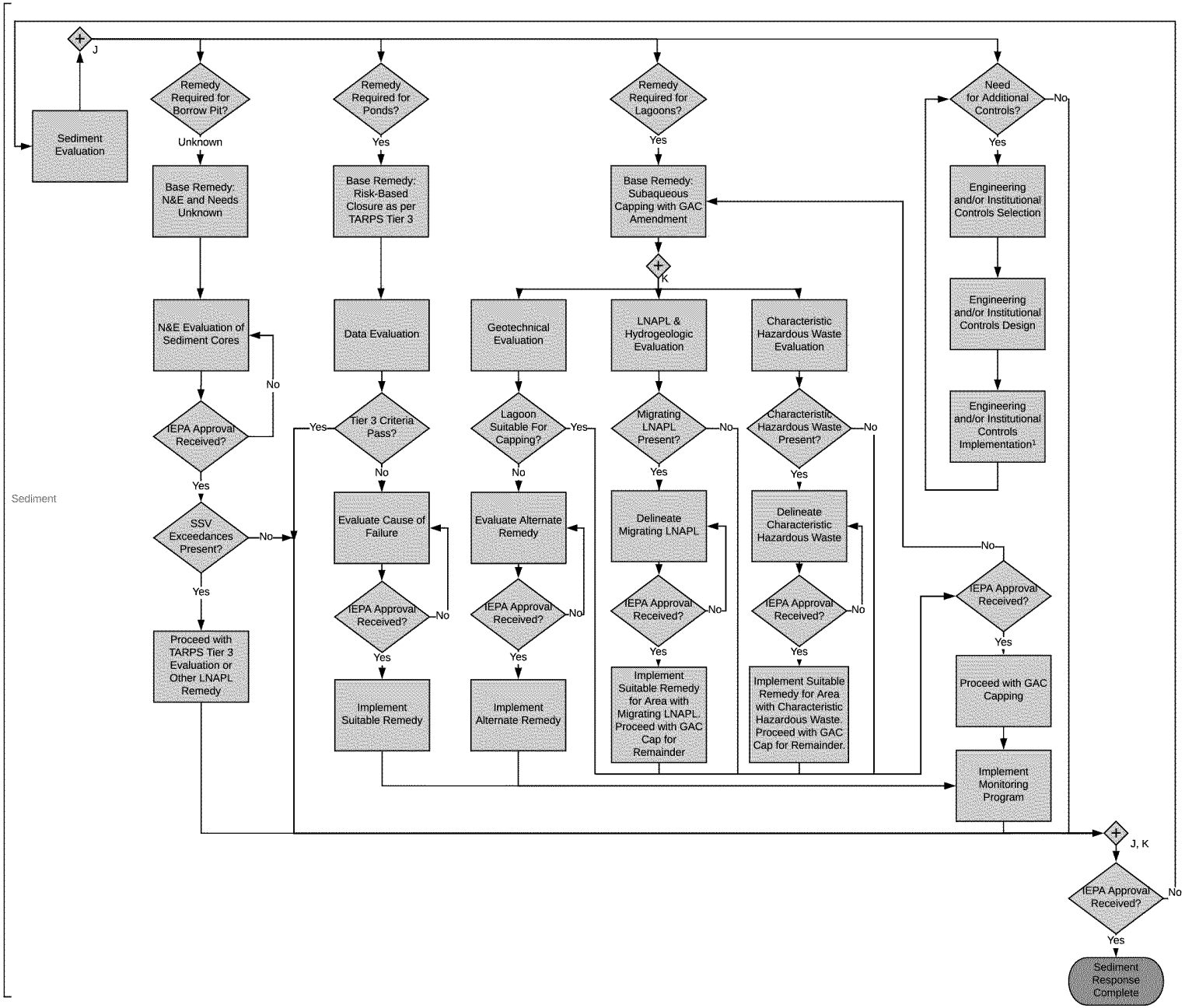
- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Assumes NAPL is present and site-specific metrics are established and approved by IEPA per the Strategic Plan (Figure 15).

2 - Soil Vapor Extraction and Bioventing would be implemented on the Western Property Boundary Line only as described in Section 4.2.

Definitions:
CAO - Corrective Action Objective
IEPA - Illinois Environmental Protection Agency
GWE - Groundwater Extraction
LNAPL - Light Non-Aqueous Phase Liquid
MEP - Maximum Extent Practicable
MNSZD - Monitored Natural Source Zone Depletion
MPE - Multiphase Extraction
O&M - Operations and Maintenance
PMR - Periodic Manual Recovery
SPR - Skimmer Pump Recovery
SVE - Soil Vapor Extraction
TFE - Total Fluids Extraction

GEI Consultants



SD01: Premcor Hartford Tactical Plan - Sediment

Notes:
Additional presumptive remedies added in the future could also be considered to achieve the sediment metrics. The applicability of the additional remedies would be outlined in a modification report.

This plan assumes that all third party property owners or controlling permit entities will approve the plan and allow access to the entirety of the area to perform the work.

Z - Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

J,K - Letters identify each unique concurrent pathway.

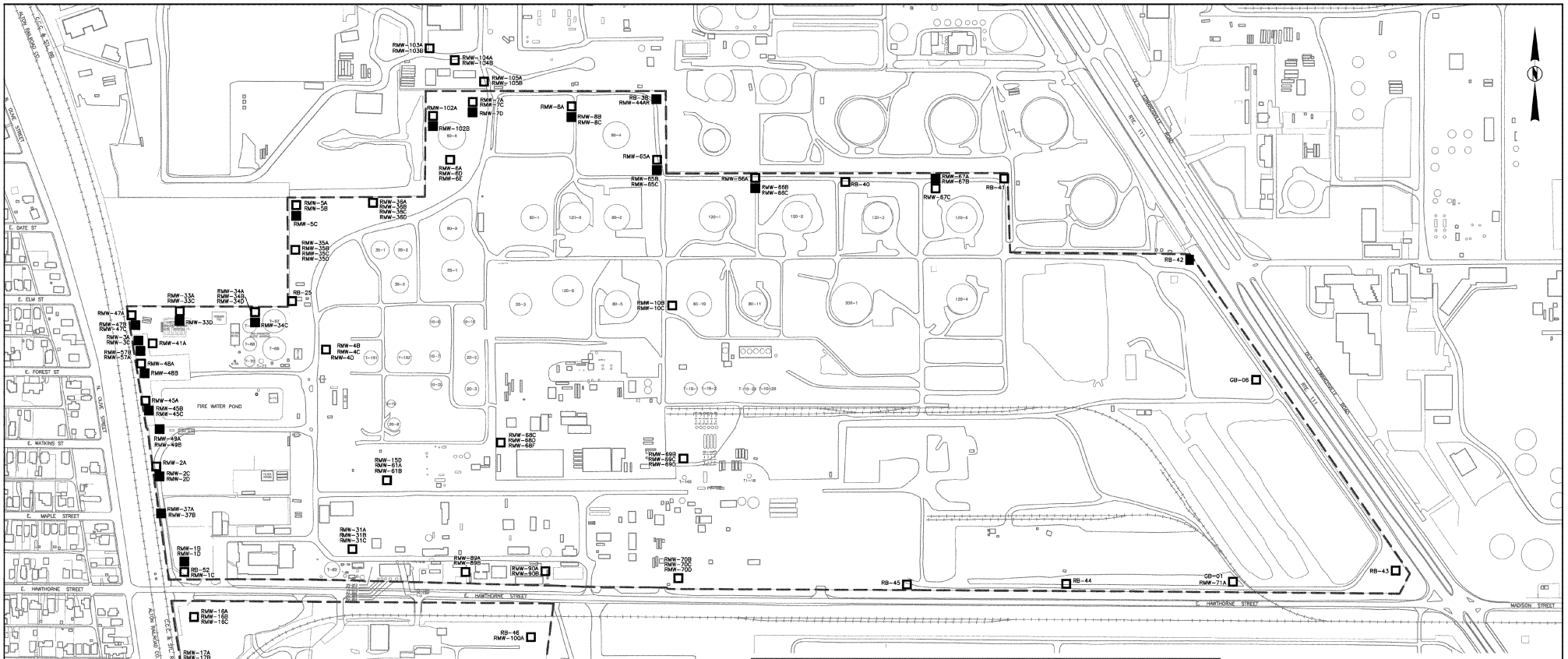
1 - Institutional controls that specify that no disturbance can occur without precautions to prevent exposure, and minimize unauthorized access, include deed records, access control, access permitting, work permits, and other controls for each affected property. Planned disturbance, such as maintenance or construction activities, will require a Soil Management Plan to specify worker protection measures for each affected property.

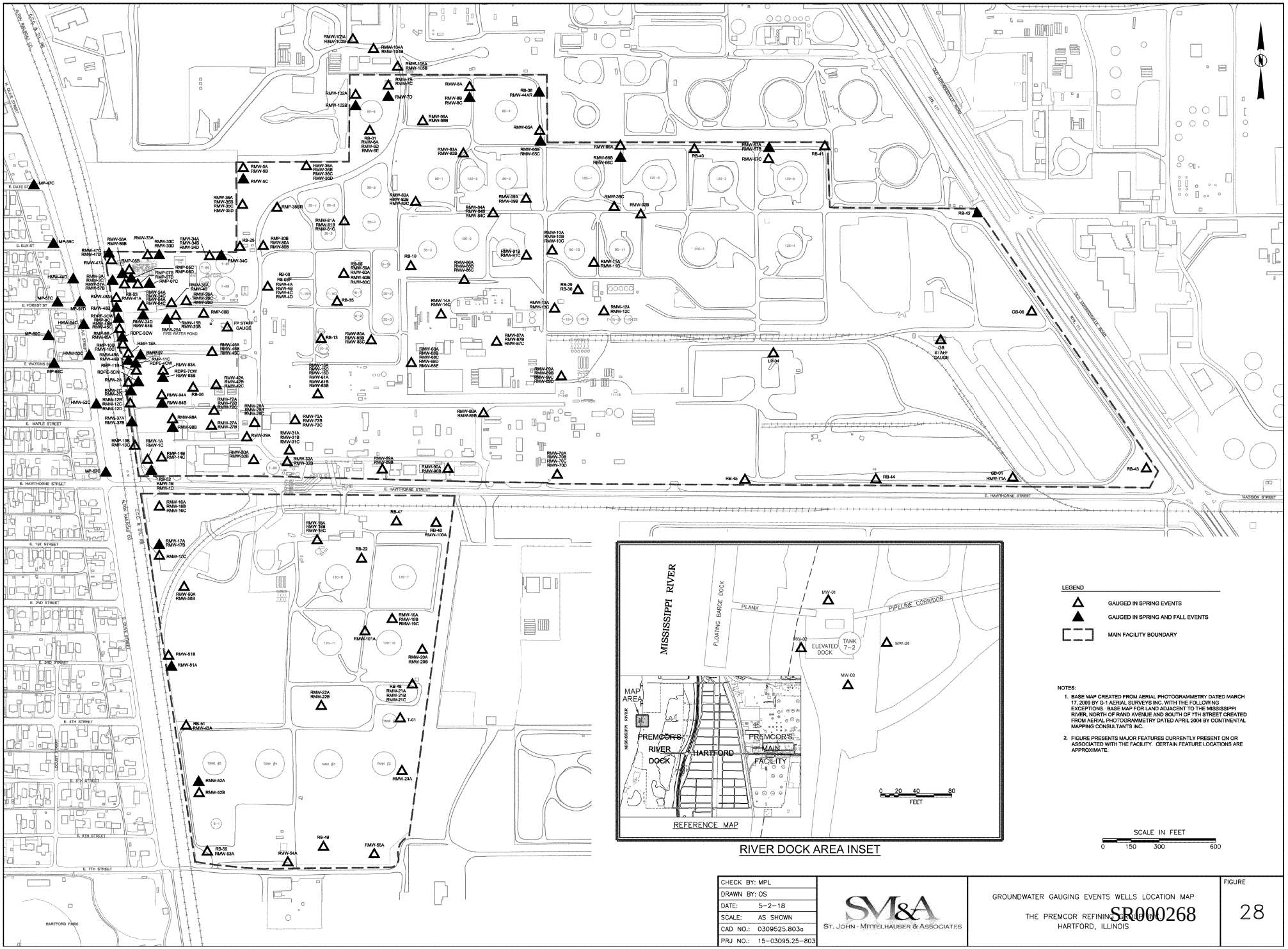
Definitions:
IEPA - Illinois Environmental Protection Agency
GAC - granular activated carbon
LNAPL - Light Non-Aqueous Phase Liquid
N&E - Nature and extent
SSV - Sediment Screening Value
TARPS - Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments

Sediment

GEI Consultants

SR000266


FIRE WATER POND
E. HAWTHORNE STREET
E. MAPLE STREET
E. FOREST ST
E. ELM ST
E. DATE ST
E. WATKINS ST
E. 1ST STREET
E. 2ND STREET
E. 3RD STREET
E. 4TH STREET
E. 5TH STREET
E. 6TH STREET
E. 7TH STREET
HARTFORD PARK
MADISON STREET
RB-38
RB-40
RB-41
RB-42
RB-43
RB-44
RB-45
RB-46
RB-48
RB-49
RB-50
RB-51
RB-52
RB-25
GB-06
GB-01
T-01
RMW-1035
RMW-134A
RMW-105A
RMW-102A
RMW-7A
RMW-8A
RMW-65A
RMW-66A
RMW-67A
RMW-108
RMW-5A
RMW-35A
RMW-33A
RMW-34A
RMW-47A
RMW-3A
RMW-57A
RMW-48A
RMW-45A
RMW-49A
RMW-2A
RMW-37A
RMW-1B
RMW-4B
RMW-68C
RMW-15D
RMW-89A
RMW-70B
RMW-31A
RMW-16A
RMW-17A
RMW-50A
RMW-51A
RMW-19A
RMW-20A
RMW-21A
RMW-23A
RMW-52A
RMW-54A
RMW-55A
RMW-71A
RMW-90A
RMW-68A
RMW-69A
RMW-61A
RMW-100A
RMW-43A
RMW-53A
RMW-52B
RMW-51B
RMW-50B
RMW-45B
RMW-49B
RMW-2C
RMW-37B
RMW-1D
RMW-1C
RMW-16B
RMW-16C
RMW-17B
RMW-17C
RMW-19B
RMW-19C
RMW-20B
RMW-21B
RMW-21C
RMW-34B
RMW-34C
RMW-33B
RMW-33C
RMW-33D
RMW-47B
RMW-41A
RMW-4C
RMW-4D
RMW-68B
RMW-68F
RMW-89B
RMW-69C
RMW-69D
RMW-70C
RMW-70D
RMW-90B
RMW-61B
RMW-31B
RMW-31C
RMW-35B
RMW-35C
RMW-35D
RMW-36A
RMW-36B
RMW-36C
RMW-36D
RMW-5B
RMW-5C
RMW-6A
RMW-6C
RMW-6E
RMW-7C
RMW-7D
RMW-8B
RMW-8C
RMW-65B
RMW-65C
RMW-66B
RMW-66C
RMW-67B
RMW-67C
RMW-102B
RMW-105B
RMW-134B
RMW-1036
RMW-44B
RMW-45C
RMW-49B
RMW-2D
RMW-1A
RMW-1B
RMW-1C
RMW-1D
RMW-16A
RMW-16B
RMW-16C
RMW-17A
RMW-17B
RMW-17C
RMW-50A
RMW-50B
RMW-51A
RMW-51B
RMW-19A
RMW-19B
RMW-19C
RMW-20A
RMW-20B
RMW-21A
RMW-21B
RMW-21C
RMW-23A
RMW-52A
RMW-52B
RMW-54A
RMW-55A
RMW-43A
RMW-53A
RMW-100A
RMW-71A
RMW-90A
RMW-90B
RMW-89A
RMW-89B
RMW-68A
RMW-68B
RMW-68C
RMW-68F
RMW-69A
RMW-69C
RMW-69D
RMW-70A
RMW-70B
RMW-70C
RMW-70D
RMW-61A
RMW-61B
RMW-15D
RMW-31A
RMW-31B
RMW-31C
RMW-4A
RMW-4B
RMW-4C
RMW-4D
RMW-108
RMW-10C
RMW-35A
RMW-35B
RMW-35C
RMW-35D
RMW-36A
RMW-36B
RMW-36C
RMW-36D
RMW-5A
RMW-5B
RMW-5C
RMW-6A
RMW-6C
RMW-6E
RMW-7A
RMW-7C
RMW-7D
RMW-8A
RMW-8B
RMW-8C
RMW-65A
RMW-65B
RMW-65C
RMW-66A
RMW-66B
RMW-66C
RMW-67A
RMW-67B
RMW-67C
RMW-102A
RMW-102B
RMW-105A
RMW-105B
RMW-134A
RMW-134B
RMW-1035
RMW-1036
RMW-44A
RMW-45A
RMW-45B
RMW-45C
RMW-47A
RMW-47B
RMW-3A
RMW-3B
RMW-57A
RMW-48A
RMW-48B
RMW-49A
RMW-49B
RMW-2A
RMW-2C
RMW-2D
RMW-37A
RMW-37B
RMW-1A
RMW-1B
RMW-1C
RMW-1D
RMW-33A
RMW-33B
RMW-33C
RMW-33D
RMW-34A
RMW-34B
RMW-34C
RMW-34D
RMW-41A
RMW-4A
RMW-4B
RMW-4C
RMW-4D
RMW-5A
RMW-5B
RMW-5C
RMW-35A
RMW-35B
RMW-35C
RMW-35D
RMW-36A
RMW-36B
RMW-36C
RMW-36D
RMW-108
RMW-10C
RMW-68A
RMW-68B
RMW-68C
RMW-68F
RMW-69A
RMW-69C
RMW-69D
RMW-70A
RMW-70B
RMW-70C
RMW-70D
RMW-89A
RMW-89B
RMW-90A
RMW-90B
RMW-61A
RMW-61B
RMW-15D
RMW-31A
RMW-31B
RMW-31C
RMW-71A
RMW-55A
RMW-54A
RMW-53A
RMW-52A
RMW-52B
RMW-51A
RMW-51B
RMW-50A
RMW-50B
RMW-49A
RMW-49B
RMW-48A
RMW-48B
RMW-47A
RMW-47B
RMW-45A
RMW-45B
RMW-45C
RMW-44A
RMW-44B
RMW-43A
RMW-23A
RMW-21A
RMW-21B
RMW-21C
RMW-20A
RMW-20B
RMW-19A
RMW-19B
RMW-19C
RMW-17A
RMW-17B
RMW-17C
RMW-16A
RMW-16B
RMW-16C
RMW-1A
RMW-1B
RMW-1C
RMW-1D
RMW-2A
RMW-2C
RMW-2D
RMW-37A
RMW-37B
RMW-3A
RMW-3B
RMW-57A
RMW-41A
RMW-33A
RMW-33B
RMW-33C
RMW-33D
RMW-34A
RMW-34B
RMW-34C
RMW-34D



CHECK BY:	MPL
DRAWN BY:	OS
DATE:	5-2-18
SCALE:	AS SHOWN
CAD NO.:	0309525.803a
PRJ NO.:	15-03095.25-803

SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES

GROUNDWATER GAUGING EVENTS WELLS LOCATION MAP

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SR000268

FIGURE 28

A1

Compliance of the Strategic Plan with Illinois EPA draft Consent Order (2007) Appendices B & C

Appendix B	Plan Compliance
Western Property Boundary Inward Gradient Control	
Requirements	
Prevent the off-site migration of groundwater exceeding Illinois EPA-approved risk-based levels from beneath the Main Facility towards the residential area of Hartford and the Village's water supply wells	Fulfilled by strategy in Figure 17 (Section 4.1.1), tactical implementation in Figure 23 (Section 4.2.1), and metrics described in Table 3 (Section 4.3).
Reports	
Western Property Boundary Gradient Control Plan	Superseded by this Strategic Plan as described in Section 5.3. Metrics as described in Table 3 (Section 4.3), monitoring as described in Table 10 and Table 11 (Section 4.4.1). Reporting as described in Section 4.4.2.
Free Product Recovery Enhancement Plan	Superseded by this Strategic Plan as described in Section 5.3. Metrics as described in Table 5 and Table 6 (Section 4.3). Reporting as described in Section 4.4.2.
Appendix C	**Plan Compliance**
Site Wide Inward Gradient Control	
Requirements	

II.A Prevent the off-site migration of groundwater exceeding Illinois EPA-approved risk-based levels	Fulfilled by strategy in Figure 17 (Section 4.1.1), tactical implementation in Figure 23 (Section 4.2.1), and metrics described in Table 3 and Table 4 (Section 4.3).
II.A.a Control the horizontal and vertical flow of the entire vertical column of groundwater exceeding Illinois EPA-approved risk-based levels in the uppermost aquifer such that groundwater flow is towards the interior [inward gradient] of the Premcor Facility. This control of groundwater flow will be accomplished by withdrawing sufficient quantities of groundwater from the uppermost aquifer. Such flow control may be necessary to prevent contaminant migration of on-site releases of product or waste, beyond the boundaries of the Premcor Facility.	Wording replaced by the options described in Table 3 and Table 4 (Section 4.3).
II.A.b Premcor must verify that the flow of groundwater is adequately controlled as required by Item (II.A.a) above.	Monitoring as described in Table 10 and Table 11 (Section 4.4.1). Reporting/approvals as described in Section 4.4.2.
Reports	
Site Wide Inward Gradient Control Work Plan	Superseded by this Strategic Plan as described in Section 5.3. Implement via presumptive technology as described in Figure 23 (Section 4.2.1). Reporting/approvals as described in Section 4.4.2.
Site Wide Inward Gradient Control Basis of Design	Superseded by this Strategic Plan as described in Section 5.3. Implement via presumptive technology as described in Figure 23 (Section 4.2.1). Reporting/approvals as described in Section 4.4.2.
Site Wide Inward Gradient Control Final Design	Implemented via presumptive technology as described in Figure 23 (Section 4.2.1). Reporting/approvals as described in Section 4.4.2.
Site Wide Free Product Recovery	
Requirements	
II.B Enhance the site-wide recovery and/or removal of LNAPL from beneath the Facility	Fulfilled by strategy in Figure 19 (Section 4.1.1), tactical implementation in Figure 25 (Section 4.2.1), and metrics described in Table 5 (Section 4.3).

Selection of which steps shall be based primarily on a technology's ability to effectively address the removal of LNAPL at the Facility, but shall also take into account a technology's implementability and cost.	Technology selection includes those listed in Section 4.2.
Reports	
Site Wide Free Product Investigation Work Plan	N/A - submitted, approved, and incorporated into CSM
Site Wide Free Product Investigation Report	N/A - submitted, approved, and incorporated into CSM
Addendum to the Site Wide Free Product Investigation Report	N/A - submitted, approved, and incorporated into CSM
Basis of Design Report for the Site Wide Management of Free Product	N/A - submitted, approved, and incorporated into CSM
Final Design Report	Superseded by this Strategic Plan as described in Section 5.3. Implement via presumptive technology as described in Figure 23 (Section 4.2.1). Reporting/approvals as described in Section 4.4.2.
Site Wide Soil Investigation	
Requirements	
Schedule whereby all activities shall be completed and a final Group investigation report submitted within 7 years after the September 19, 2006 approval date (assuming Illinois EPA may take up to 90 days to review an investigation work plan for a given phase or areas to be investigated).	N/A - Streamlined work processes presented in Strategic Plan.
The Work Plans shall be prepared and the investigation conducted consistent with "Guidance for Preparing RCRA Closure Plans (July 2003)," where applicable.	Work Plans shall be partially superseded by streamlined approach presented in Strategic Plan. When Work Plans are developed as part of a preapproval report, the RCRA Guidance will be utilized as applicable and sufficient information will be provided for decision making and implementation.
The site--wide soil investigation shall be performed using a phased approach and shall include a qualitative phase to identify areas with contamination followed by a	Completed.

quantitative phase to determine the horizontal and vertical extent of contamination.	
It is recognized that portions of the Facility are being operated by others and that these operations will impact the level of investigation that can occur in these areas.	Addressed in Section 4.2.
During the quantitative phase, the horizontal and vertical extent of contamination shall be delineated with soil borings and associated chemical analyses.	Completed.
If groundwater is encountered prior to delineating the vertical extent of soil contamination, a groundwater investigation shall be conducted consistent with 35 Ill . Adm. Code 725.	Completed except for Group 3 which is awaiting implementation.
Reports	
Current Conditions Report	N/A - submitted, approved, and incorporated into CSM
Site Wide Soil Investigation Work Plan	N/A - submitted, approved, and incorporated into CSM
Group 1 Soil Investigation Work Plan	N/A - submitted, approved, and incorporated into CSM
Group 1 Soil Investigation Report	N/A - submitted, approved, and incorporated into CSM
Group 1 Soil Investigation Addendum and Summary Report	N/A - submitted, approved, and incorporated into CSM
Group 2 Soil Investigation Work Plan	N/A - submitted, approved, and incorporated into CSM
Group 2 Soil Investigation Report	N/A - submitted, approved, and incorporated into CSM
Group 2 Supplemental Soil Investigation Work Plan	N/A - submitted, approved, and incorporated into CSM
Group 2 Supplemental Soil Investigation Report	N/A - submitted, approved, and incorporated into CSM
Group 3 Soil Investigation Work Plan	N/A - submitted, approved, and incorporated into CSM
Group 3 Soil Investigation Report	N/A - submitted, approved, and incorporated into CSM
Group 3 Groundwater Investigation Work Plan	N/A - submitted, approved, and awaiting implementation.
Group 4 Soil Investigation Work Plan	N/A - submitted, approved, and incorporated into CSM
Group 4 Soil Investigation Report	N/A - submitted, approved, and incorporated into CSM

Addendum to the June 30, 2006 Site Wide Soil Investigation Work Plan to address the indoor inhalation exposure route	If the indoor inhalation exposure route is not excluded and an investigation is conducted, the investigation will be completed such that an evaluation can be completed to meet the requirements of 35 IAC Part 742 (TACO) and documented according to the Strategic Plan approach and incorporating the draft Illinois EPA General Guidance (Illinois EPA 2017), or the most current method approved by the Illinois EPA.
Corrective Action	
Requirements	
The purpose of the Corrective Action Plan is to describe how Premcor shall mitigate soils and groundwater exceeding risk-based corrective action objectives. The results of previously collected soil and groundwater samples shall be evaluated using 35 IAC 742 Tiered Approach to Corrective Action Objectives (TACO). Exposure routes shall be evaluated to verify whether they are complete. Site-specific information shall be utilized to develop corrective action objectives, where necessary. The plan shall describe the corrective action approach for meeting risk-based corrective action objectives and the methods for verifying that the applicable objectives have been met.	Identifying CAOs under TACO and monitoring progress to achieve them is the organizing principle behind the Strategic Plan (Figure 2, Section 1.2). Investigation progress and corrective action implementation will be reported as described in Section 4.4.2.
It is recognized that portions of the Facility are being operated by others and that these operations will impact the level of remediation that can occur in these areas.	Addressed in Section 4.2.
Reports	
Corrective Action Objectives Report	Wherever possible, quantitative metrics and thresholds are identified as part of this Strategic Plan in Section 4.3. Any additional metrics/objectives would be proposed in a CAOR as defined in Section 4.4.2.

Conceptual Design Report	Implement via presumptive technology as described in Figure 22 - Figure 25 (Section 4.2.1). Reporting/approvals as described in Section 4.4.2.
Final Design Report	Implement via presumptive technology as described in Figure 22 - Figure 25 (Section 4.2.1). Reporting/approvals as described in Section 4.4.2.
Groundwater Protection Standard Compliance Work Plan	Groundwater monitoring will proceed according to Table 10 and Table 11 (Section 4.4.1) and be reported as described in Section 4.4.2. Any modification of this schedule as the CSM improves or areas are closed would need to be updated through the modification process in Section 4.5.
Construction Completion Report	Implement via presumptive technology as described in Figure 22 - Figure 25 (Section 4.2.1). Reporting/approvals as described in Section 4.4.2.
Corrective Measures Completion Report	Described in Section 4.4.2.

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INDEX OF KEY DOCUMENTS SUBMITTED TO ILLINOIS EPA

1190500002 -- Madison County -- ILD041889023

The Premcor Refining Group Inc. / Hartford, Illinois

Date Submitted	Document Title	Agency Comments	Agency Status
DOCUMENT PRIOR TO THE DRAFT CONSENT ORDER (2007)			
4/29/2003	Current Conditions Report (Volumes 1-3)	10/07/03-Illinois EPA comments on Current Conditions Report. Illinois EPA is in general agreement with the contents of the Current Conditions Report and therefore the next step is the development and eventual implementation of a plan to investigate/characterize the extent of soil contamination. Included is Illinois EPA's Required Contents of a Soil Investigation Workplan.	
INTERIM MEASURES ALONG WESTERN PROPERTY BOUNDARY - INWARD GRADIENT CONTROL - Draft Consent Order (2007) Section VIII.B.1.b.1.			
3/4/2005	Western Property Boundary Inward Gradient Control Plan	4/12/05 - Approved subject to specified conditions and modifications.	5/5/05 - Replacement cover pages 5/6/05 - Revised Contingency Plan (approved 7/12/05).

5/6/2005	Revised Contingency Plan for Western Property Boundary Gradient Control Plan	7/12/05-Approved subject to specified conditions and modifications.	
6/22/2005	Measures to Address Water Level Data Gaps and Anomalies	7/12/05-Approved subject to specified conditions and modifications.	7/26/05
10/7/2005	Transmittal - Memorandum: Installation of Shallow Pumping Well	12/29/05 - Approved subject to specified conditions and modifications.	
11/2/2005	Step Test and Constant-Rate Pumping Test Memorandum	12/29/05 - Approved subject to specified conditions and modifications.	
1/30/2006	Preliminary Pumping Test Results Technical Memorandum	07/17/06 - Approved subject to specified conditions and modifications.	
6/28/2006	Request to Discontinue Pumping of Production Well P-6	01/5/07 - Approved subject to specified conditions and modifications.	
5/11/2007	Response Action Plan for Inward Gradient Control Pumping Wells	10/12/07 - Approved subject to specified conditions and modifications.	
12/6/2007	Response Action Plan for Inward Gradient Control Pumping Wells - Revision 01	No Response Received or Expected.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
3/2/2011	Request Shutdown of Production Well P-6 & Reduce Pumping Rate at RPW-01	4/1/11 - Approved subject to specified conditions and modifications.	

5/2/2011	Response Action Plan for Groundwater Inward Gradient Control - Revision 02	1/13/12 - Plan cannot be approved until specified conditions and modifications are met.	4/16/12 - Premcor reply to Illinois EPA Letter Dated January 13, 2012. 5/22/2012 - Filed appeal with IL PCB.
5/11/2011	Letter Re: April 2011 (Second Quarter 2011) Groundwater Contour Maps (WPB Gradient Control)	1/13/12 - Does not concur that Premcor has inward gradient control.	4/16/12 - Premcor reply to Illinois EPA Letter Dated January 13, 2012. 5/22/2012 - Filed appeal with IL PCB.
8/19/2011	Letter Re: August 2011 Gauging Event and Groundwater Contour Maps	1/13/12 - Does not concur that Premcor has inward gradient control.	4/16/12 - Premcor reply to Illinois EPA Letter Dated January 13, 2012. 5/22/2012 - Filed appeal with IL PCB.
02/07/2012	Letter providing supplemental information in preparation for 02/14/2012 meeting with Illinois EPA concerning their 01/13/2012 letter	No Response Received or Expected.	
4/30/2012	Letter Re: April (Q2) 2012 Groundwater Contour Maps	6/26/12 - (also replies to Premcor's 4/16/12 submittal) Approved subject to specified conditions and modifications; 3/3/13 (Reply to 7/24/12 Letter - Requirement to notify Illinois EPA when P-1/P-2 or P-5	7/24/12 - Reply to Illinois EPA's Letter Dated June 26, 2012.

		pumping rates changed rescinded).	
8/14/2012	Response Action Plan for Groundwater Inward Gradient Control - Revision 3	3/13/13 - Approved subject to specified conditions and modifications.	
10/4/2012	Letter Re: July (Q3) 2012 Groundwater Contour Maps	3/13/13 - Approved subject to specified conditions and modifications.	
12/7/2012	Letter Re: Modification to WPB Inward Gradient Control System	9/24/13 - Approved subject to specified conditions and modifications.	
12/13/2012	Letter Re: October (Q4) 2012 Groundwater Contour Maps		
6/20/2013	Western Property Boundary Inward Gradient Control System - RPW-02 and RPW-03 Installation Documentation Report	9/24/13 - Approved subject to specified conditions and modifications.	
7/10/2013	Response Action Plan for Groundwater Inward Gradient Control - Revision 4	9/24/13 - Approved subject to specified conditions and modifications.	
8/16/2013	Letter Re: July (Q3) 2013 Groundwater Contour Maps		
7/14/2014	Letter Re: Production Well P-6 Repairs		
9/12/2014	Letter: Production Well P-6 Repair/Rehabilitation		

	Gauging Event and Groundwater Contour Maps		
7/20/2016	Letter Re: Notification of Production Well P-6 and Pumping Well RPW-03 Cleaning		
8/19/2016	Letter Re: Request to Conduct Semi-Annual Gauging	2/1/17 - Approved subject to specified conditions and modifications.	
TANK 80-11 - Draft Consent Oder (2007) Section VIII.B.1.d.2.			
1/27/2005	Tank 80-11 Release Area Soil and GW Investigation Work Plan	2/10/05 - Approved subject to specified conditions and modifications.	
4/8/2005	Tank 80-11 Release Area Soil and GW Investigation Report	7/15/05 and 7/26/05-Draft response letters received via email; 8/24/05 - Approved subject to conditions and modifications.	
1/27/2006	Tank 80-11 Soil Remediation Report	02/21/06 - Approved subject to specified conditions and modifications.	
11/9/2006	Work Plan: Investigation of Soil Beneath Tank 80-11	Draft Letter Received 11/29/06; Final Letter Dated 1/22/07.	
3/28/2007	Tank 80-11 Release Area - Report of Soil Investigation Beneath Tank 80-11	5/22/07 - Approved subject to specified conditions and modifications.	

SITE WIDE FREE PRODUCT RECOVERY ENHANCEMENT - Draft Consent Order (2007) Section VIII.B.1.c.2.			
4/4/2005	Site Wide Free Product Investigation Work Plan (2 Volumes)	4/20/05 Phone Conversation (referenced in Clayton's correspondence on 4/22/05) 6/22/05-Approved subject to specified conditions and modifications.	4/22/05 - Clarification letter 6/13/05 - Revised figure.
1/23/2006	Site Wide Free Product Investigation Report (3 Volumes)	07/17/06 - Approved subject to specified conditions and modifications.	
6/28/2006	Proposed Monitoring Well and Core Sample Locations (Figure)	07/17/06 - Approved subject to specified conditions and modifications.	9/6/2006- Response provided basis as to why an additional well southwest of RB-52 requested by the Agency could not be installed.
9/14/2006	Work Plan for Additional Site Wide Free Product Investigation	04/04/07 - Approved subject to specified conditions and modifications.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
5/28/2009	Addendum to Site Wide Free Product Investigation Report	2/25/11 - Draft approval letter received via email; 6/28/12 - Approved subject to specified conditions and modifications.	
1/26/2010	Establishment of LNAPL Management Districts, Premcor	2/25/11 - Draft approval letter received via email; 6/28/12 - Approved subject to specified	

	Facility, Hartford, IL	conditions and modifications.	
10/26/2012	Basis of Design for Site Wide Management of Free Product	2/3/15 - Approved subject to specified conditions and modifications; 8/27/15 - Approved subject to specified conditions and modifications.	3/20/15 - Premcor's Response to Agency's Approval Letter.
10/21/2015	Request for Extension of Final Design Report for LNAPL Management Districts 1A and 1B Due Date	10/30/15 - Agency approval via email.	
12/23/2015	Request for Extension of Final Design Report for LNAPL Management Districts 1A and 1B Due Date	1/15/16 - Agency approval via email.	
2/25/2016	Final Design Report for Management of Free Product in Districts 1A and 1B - Volume 1 of 2: Final Design Documentation and Construction Work Plan		
2/25/2016	Final Design Report for Management of Free Product in Districts 1A and 1B - Volume 2 of 2: Operation and Maintenance Plan For Free Product Recovery Systems In Districts 1A and 1B		

INTERIM MEASURES ALONG WESTERN PROPERTY BOUNDARY - FREE PRODUCT RECOVERY ENHANCEMENT SVE SYSTEM- Draft Consent Order (2007) Section VIII.B.1.b.2.			
5/29/2003	FPH Recovery Enhancement Work Plan	9/7/04 8:50 AM email including attachment dated 8/5/03 providing approval subject to specified conditions and recommendations.	
8/29/2003	Free Phase Hydrocarbon Recovery Enhancement Evaluation (Section 6 includes results of SVE pilot test) - report submitted by Premcor	9/7/04 10:54 email includes attachments (one undated & second dated 9/2/04) - document not acceptable.	
9/17/2004	Field Schedule for FPH Recovery Enhancement Work Plan	10/12/04 - Approved subject to specified conditions and recommendations (document conveyed via email).	
6/3/2005	Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report (Appendix B contains results of MPE Pilot Test)	8/30/05 - Received comments from Illinois EPA via email; 9/29/05 - SVE portion of Plan approved subject to specified conditions and modifications. 4/15/08 - remainder of plan approved with specified conditions and modifications based on the subsequent submittal of the September 18, 2006 Addendum, the September 27, 2006 Low-Flow Pilot Testing procedures, and the December 14, 2007 Extended Low-Flow Dual Phase Extraction Pilot Test Report.	11/15/05 Provided draft response to Agency's 8/30/05 comments; 2/7/06 Agency commented on draft correspondence; 3/24/06 Submitted final response to Agency's 8/30/05 comments; 7/17/06 Agency approved response.

7/14/2005	Soil Vapor Monitoring - July 2005 Quarterly Monitoring Report	No Response Received or Expected.	
7/28/2005	Plan to Evaluate Dissolved BETX at RMW-35A	10/19/05 - Approved subject to specified conditions and modifications.	
10/14/2005	Vapor Monitoring Ports - Quarterly Monitoring Report October 2005	No Response Received or Expected.	
12/16/2005	Final Design Report - IM Western Property Boundary Free Product Enhancement Plan.	02/08/06 - Approved subject to specified conditions and modifications.	
1/13/2006	Vapor Monitoring Ports - Quarterly Monitoring Report January 2006	No Response Received or Expected.	
4/7/2006	Vapor Monitoring Ports - Quarterly Monitoring Report - March 2006	No Response Received or Expected.	
7/6/2006	Vapor Monitoring Ports Quarterly Monitoring Report	No Response Received or Expected.	
12/4/2006	SVE System Construction Completion Report	1/25/07 - Approved subject to specified conditions and modifications.	
2/5/2007	RMW-35A Area Investigation Report and Remedial Design Plan	5/24/07 - Received Memo via email recommending approval of submittal; 6/7/07 - Approved subject to specified conditions and modifications.	
11/16/2007	RMW-35A Area SVE Expansion Construction	4/18/08 - Approved subject to specified conditions and	

	Completion Report	modifications.	
3/3/2008	Request to Modify SVE Effectiveness Monitoring Plan	4/10/08 - Draft response received via email; 4/30/08 - Approved subject to specified conditions and modifications.	
8/8/2008	Request to Combine Quarterly Progress Report and SVE Effectiveness Quarterly Monitoring Report	10/7/08 - Approved subject to specified conditions and modifications.	
11/12/2008	Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan (Revision No. 1)	12/4/08 - Draft approval letter received via email; 2/9/09 - approved subject to specified conditions and modifications.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
3/26/2009	Request to Reduce Frequency of SVE Effectiveness Monitoring	7/02/09 - Approved subject to specified conditions and modifications.	
5/8/2009	Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan (Revision No. 2)	7/02/09 - Approved subject to specified conditions and modifications.	
10/6/2009	Request to Remove RVMP-10 Well Nest from the SVE Effectiveness O&M Plan	4/13/10 - Verbal approval (phone conversation between M.Nienkerk & J.Moore).	

12/9/2009	Request to Modify the SVE Effectiveness O&M Plan	3/3/10 - Approved subject to specified conditions and modifications.	
5/13/2010	Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan Rev. 03	11/4/10 - Approved subject to specified conditions and modifications.	
10/8/2012	Letter Re: Request to Modify SVE & LFDPE O&M Plans	12/21/12 - Reduces SVE/LFDPE Effectiveness Monitoring from quarterly to annual. Also requires daily, weekly, & monthly systems monitoring already required by the systems O&M plans.	
11/17/2017	Letter Re: Notification: RMW-35A SVE Area Shutdown		
INTERIM MEASURES ALONG WESTERN PROPERTY BOUNDARY - FREE PRODUCT RECOVERY ENHANCEMENT - LFDPE SYSTEM - Draft Consent Order (2007) Section VIII.B.1.b.3.			
6/3/2005	Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report (Appendix B contains results of MPE Pilot Test)	8/30/05 - Received comments from Illinois EPA via email; 9/29/05 - SVE portion of Plan approved subject to specified conditions and modifications. 4/15/08 - remainder of plan approved with specified conditions and modifications based on the subsequent submittal of the September 18, 2006 Addendum, the September 27, 2006 Low-Flow Pilot Testing procedures, and the December 14, 2007	11/15/05 Provided draft response to Agency's 8/30/05 comments; 2/7/06 Agency commented on draft correspondence; 3/24/06 Submitted final response to Agency's

		Extended Low-Flow Dual Phase Extraction Pilot Test Report.	8/30/05 comments; 7/17/06 Agency approved response.
10/10/2005	Transmittal of Technical Memorandum - LNAPL Characterization and Recovery Pilot Testing Plan, Premcor - Hartford Site	02/02/06 - Approved subject to specified conditions and modifications.	
9/18/2006	Addendum to Western Property Boundary Free Product Recovery Enhancement Plan Basis of Design Report	4/8/08 - Draft response received; 4/15/08 - approved subject to specified conditions and modifications.	4/23/08 - Correspondence submitted to clarify conditions.
9/27/2006	Low-Flow DPE Extended Pilot Testing Memorandum	4/8/08 - Draft response received; 4/15/08 - approved subject to specified conditions and modifications.	
12/14/2007	Extended Low-Flow Dual Phase Extraction Pilot Test Report	4/8/08 - Draft response received; 4/15/08 - approved subject to specified conditions and modifications.	
6/13/2008	Western Property Boundary Final Design Documentation and Construction Work Plan Addendum	3/11/09 - Draft approval letter received via email. 4/13/09 - Final approval letter - approved subject to specified conditions and modifications.	3/27/09 - Provided redline strikeout version of approval letter.
6/13/2008	Western Property Boundary Free Product Recovery Enhancement Low-Flow Dual Phase Extraction Operation and Maintenance Plan	10/27/08 - Draft list of conditions received via email; 3/11/09 - Draft approval letter received via email. 4/13/09 - Final approval letter - approved subject to specified	11/4/2008 - Sent email and red-line strikeout version of conditions; 3/27/09 -

		conditions and modifications.	Provided redline strikeout version of approval letter.
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
5/26/2011	Construction Completion Report Western Property Boundary Low-Flow Dual Phase Extraction System Premcor Main Facility	6/8/12 - Approved subject to specified conditions and modifications.	
8/4/2011	Letter Re: Western Property Boundary Low-Flow Dual Phase Extraction System Construction Completion Report Revisions (revised Figure AB-6)	6/8/12 - Approved subject to specified conditions and modifications.	
10/8/2012	Letter Re: Request to Modify SVE & LFDPE O&M Plans	12/21/12 - Reduces SVE/LFDPE Effectiveness Monitoring from quarterly to annual. Also requires daily, weekly, & monthly systems monitoring already required by the systems O&M plans.	
11/24/2014	Letter Re: LFDPE System – Changing Mode of Operation	2/18/15 - Approved subject to specified conditions and modifications.	
8/10/2016	Letter Re: LNAPL Transmissivity Tests		

SITE WIDE INWARD GRADIENT CONTROL - Draft Consent Order (2007) Section VIII.B.1.c.1.			
7/1/2005	Work Plan Site Wide Inward Gradient Control	12/29/05 Approved in concept subject to specified conditions and modifications; an Addendum to the Work Plan is due May 5, 2006.	Addendum submitted May 5, 2006 and approved 1/8/07.
9/16/2005	Transmittal - Memorandum: Additional Deep Nested Monitoring Wells	11/15/05 - Approved subject to specified conditions and modifications.	
5/5/2006	Addendum to Site Wide Inward Gradient Control Work Plan	01/8/07 - Approved subject to specified conditions and modifications.	
1/17/2007	Request to Conduct Quarterly Gauging and Reporting	1/31/07 - Approved verbally; 2/15/07 - received written approval letter.	
2/27/2007	Request to Modify Groundwater Monitoring Program	7/30/07- Approved subject to specified conditions and modifications.	
3/9/2007	Site Wide Inward Gradient Control Basis of Design Report (Document Withdrawn)	5/28/2009 - Accepts 4/9/2009 & 5/7/2009 requests to withdraw subject to specified conditions & modifications.	
6/1/2007	Request to Not Submit 0.10-Foot Groundwater Contour Map	7/30/07- Approved subject to specified conditions and modifications.	
3/27/2008	Request to Modify Groundwater Monitoring Program	6/27/08 - Approved via email; 7/8/08 - Final approval letter received.	
8/8/2008	Request to Combine Quarterly Progress Report and SVE	10/7/08 - Approved subject to specified conditions and modifications.	

	Effectiveness Quarterly Monitoring Report		
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
4/9/2009	Withdrawal of the Site Wide Inward Gradient Control Basis of Design Report	4/9/09 - Agency email acknowledgment of receipt of Premcor's April 9, 2009 letter withdrawing report; 5/28/09 - Approved subject to specified conditions and modifications.	
5/7/2009	Addendum to April 9, 2009 Letter Withdrawing the March 9, 2007 Site Wide Inward Gradient Control Basis of Design Report	5/28/09 - Approved subject to specified conditions and modifications.	
5/28/2009	Groundwater Monitoring Plan (Revision No. 1)	9/17/09 - Approved subject to specified conditions and modifications.	
10/2/2009	Confirmation of 9/24/09 and 9/30/09 telephone conversations with Paula Stine regarding two approval letters dated 9/17/09 concerning the 5/28/09 Groundwater Monitoring Plan and 7/2/09 Notification of RB-37 Abandonment	10/6/09 - Telephone Conversation Confirmed.	
10/15/2009	New Site Wide Inward Gradient Control Basis of Design Report - Request for a Revised Submittal Date	12/28/09 - Approved subject to specified conditions and modifications.	

11/24/2009	Request to Conduct Semi-Annual Gauging	12/18/09 - Email response - request was denied.	
5/4/2010	Request to Reconsider Semi-Annual Gauging	5/25/10 - Approved subject to specified conditions and modifications.	
6/22/2010	New SWIGC Basis of Design Report Request for Time Extension	8/25/10 - Approved subject to specified conditions and modifications.	
6/29/2010	Request to go to Quarterly Status Reports and Annual Comprehensive Reports.	11/17/10 - Request Approved.	
7/16/2010	Request to Modify Groundwater Monitoring Program	9/8/10 - Approved subject to specified conditions and modifications.	
1/21/2011	Request to Modify Groundwater Monitoring Plan and Abandon Wells	3/14/11 - Approved subject to specified conditions and modifications.	
5/11/2011	GW Monitoring Plan - Revision No. 02	1/13/12 - approved; Plan incorporates changes approved by Illinois EPA in their 3/14/11 letter approving the 1/21/11 Request to Modify the Plan.	
1/13/2012	Letter Re: Request to Modify GW Monitoring Plan	4/27/12 - Request to decrease number of analytical parameters – denied; Request to decrease number of monitoring wells – approved with modifications; Request to conduct HydraSleeve pilot test – approved.	6/4/12 - Reply to Condition 3 of Illinois EPA's April 27, 2012 Letter.
3/21/2012	Letter Re: Supplemental Information	4/27/12 - Approved subject to specified conditions and	

	(HydraSleeve pilot test) to January 13, 2012 Request to Modify Groundwater Monitoring Plan	modifications.	
10/4/2012	Letter Re: Request to Modify Groundwater Monitoring Plan	3/13/13 - Approved subject to specified conditions and modifications.	
5/31/2013	Revision No. 3 of the Groundwater Monitoring Plan	9/24/13 - Approved subject to specified conditions and modifications.	
6/13/2013	Revision No. 3 of the Groundwater Monitoring Plan - Appendix A Sampling and Analyses Plan: Attachment A Standard Operating Procedures Errata	9/24/13 - Approved subject to specified conditions and modifications.	
11/5/2013	Request to Modify Groundwater Monitoring Plan	2/20/14 - Rejected pending additional information.	
12/9/2014	Letter Re: Request to Abandon Monitoring Well RB-26 and Remove from the Groundwater Monitoring Plan	2/19/15 - Approved subject to specified conditions and modifications.	
12/16/2014	Letter Re: Supplemental Information to Support November 5, 2013 Request to Modify Groundwater Monitoring Plan	3/12/15 - Rejected pending additional information.	
3/7/2016	Alternate Source Demonstration Groundwater Impact at	4/30/18 - Approved by the Illinois EPA	

	RMW-43A		
SITE WIDE SOIL INVESTIGATION - Draft Consent Order (2007) Section VIII.B.1.c.3.			
6/30/2006	Site Wide Soil Investigation Work Plan	Draft Letter Received August 16, 2006; Final Letter Dated Sept. 19, 2006.	
1/17/2007	Group 1 Soil Investigation Work Plan	5/30/07 - Draft response letter received via email; 7/30/07 - approved subject to specified conditions and modifications.	
5/22/2008	Group 1 Soil Investigation Report	12/15/08 - Draft approval letter received; 2/24/10 - Approved subject to specified conditions and modifications.	3/10/09 - Provided redline strikeout version of approval letter.
6/30/2008	Group 2 Soil Investigation Work Plan	10/30/09 - Approved subject to specified conditions and modifications.	
12/30/2008	Discontinuation of Weekly Status Reports and Field Schedules	7/31/09 - Approved effective the date of our 12/30/2008 letter.	
10/20/2009	LNAPL and Groundwater Status for Site Wide Soil Investigation Group 1 - South of Hawthorne Street	2/24/10 - Acknowledgment contained in Condition 7C of 2/28/10 letter approving Group 1 Soil Investigation Report.	
4/5/2010	Site Wide Soil Group 1 Additional Step-Out Locations	4/6/10 - Email acknowledgment.	
8/5/2010	Group 3 Soil Investigation Work Plan	11/10/10 - Verbal Approval Received, 1/31/11 - Approved subject to specified conditions	

		and modifications.	
10/22/2010	Group 1 Soil Investigation Addendum and Summary Report	2/29/12 - Approved subject to specified conditions and modifications.	
2/28/2011	Preliminary Group 2 Soil Investigation Data Evaluation Memorandum	07/22/2011 - Email received from Takako Halteman (Illinois EPA) providing comment on the memorandum & requiring submittal of the Group 2 Soil Investigation Report by 11/01/2011.	
10/28/2011	Group 2 Soil Investigation Report	5/22/13 - Approved subject to specified conditions and modifications. Requires supplemental soil investigation. Supplemental Soil Investigation Work Plan due by 8/20/2013.	
9/14/2012	Group 3 Soil Investigation Report	10/14 – Draft Approval Letter; 6/30/15 - Approved subject to specified conditions and modifications.	3/9/15 - Premcor's Response to Agency's Draft Approval Letter; 8/28/15 Premcor's Response to Approval of Group 3 Soil Investigation Report.
3/20/2013	Group 4 Soil Investigation Work Plan	9/23/13 - Approved subject to specified conditions and modifications.	
6/27/2013	Group 3 Soil Investigation Errata for Section 5.1.3 and	10/14 – Draft Approval Letter; 6/30/15 - Approved subject to specified conditions and	3/9/15 - Premcor's Response to Agency's Draft

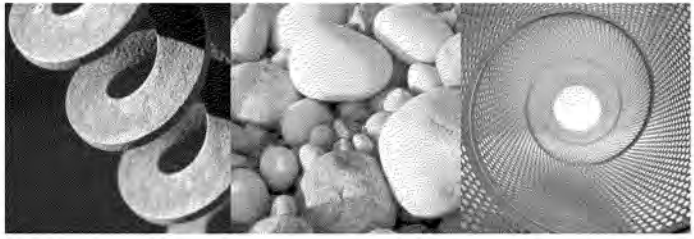
	Appendices E	modifications.	Approval Letter.
8/16/2013	Group 2 Supplemental Soil Investigation Work Plan	11/7/14 - Approved subject to specified conditions and modifications.	
5/6/2014	Group 2 Supplemental Soil Investigation Work Plan: Revised Table 2.1	11/7/14 - Approved subject to specified conditions and modifications.	
6/27/2014	Response to June 13, 2014 Illinois EPA Email requesting additional information for the Group 3 Area.	10/14 – Draft Approval Letter; 6/30/15 - Approved subject to specified conditions and modifications.	3/9/15 - Premcor's Response to Agency's Draft Approval Letter.
7/25/2014	Group 4 Soil Investigation Report	8/6/15 - Draft Approval Letter; 11/24/15 - Approved subject to specified conditions and modifications.	9/2/15 - Premcor's Response to Agency's Draft Approval Letter; 3/22/16 - Premcor's Response to Agency's Approval Letter
8/27/2014	Additional Information Requested by Illinois EPA in a July 17, 2014 email regarding the Group 2 Supplemental Soil Investigation WP: TPH Evaluation		
9/24/2014	Response to September 10, 2014 Email regarding request for additional information on the TPH Evaluation		

	for Group 2		
5/21/2015	Group 2 Supplemental Soil Investigation Report	8/28/15 - Draft Approval Letter; 11/24/15 - Approved subject to specified conditions and modifications.	9/15/15 - Premcor's Response to Agency's Draft Approval Letter.
9/2/2015	Group 4 Soil Investigation Report Errata for Table 5-5 and Table in Appendix I	11/24/15 - Approved subject to specified conditions and modifications.	3/22/16 - Premcor's Response to Agency's Approval Letter.
10/29/2015	Group 3 Groundwater Investigation Work Plan	8/1/17 - Approved subject to specified conditions and modifications.	
5/10/2016	Group 1 Soil Investigation Report Errata for Table D-1 in Appendix D - Soil Analytical for Area 9		
5/10/2016	Group 1 Soil Investigation Addendum and Summary Report Errata for Table 4-1		
5/10/2016	Group 2 Soil Investigation Errata for Section 5.3.2, Table 4-1, Figure 5-60		
5/10/2016	Group 2 Supplemental Soil Investigation Errata for Table 2-1A		
5/10/2016	Group 3 Soil Investigation Errata for		

	Table 4-1		
5/10/2016	Group 4 Soil Investigation Errata for Section 5.3.2, Table 4-1, Figures 5-31 and 5-51		

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Path Forward Approach for the River Dock Area Sediments, Premcor Facility



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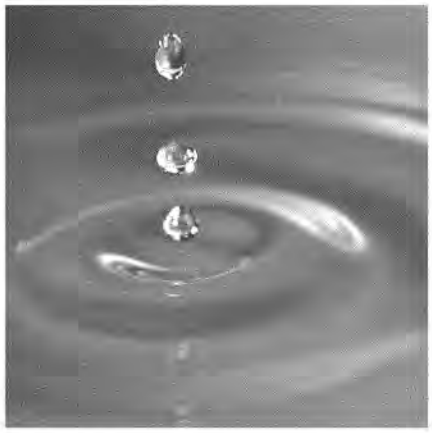
RIVER DOCK AREA SEDIMENTS

Former Hartford Refinery Facility

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Executive Summary

This *Path Forward Approach for the River Dock Area Sediments* (Path Forward Approach) presents a conceptual plan for evaluating and determining remedial objectives for impacted material and sediments in the lagoons and ponds present in the River Dock Area and to propose remedial approaches. The document presents current information on sediment quality and identifies data gaps that should be considered to characterize physical and chemical properties of lagoon and pond sediments. This document also outlines requirements to be met for determining remedial objectives and proposes remedial measure design, permitting, and implementation to address remedial objectives.

The Path Forward Approach complements work associated with other portions of the River Dock Area. The data developed from previous site investigations provides the basis for the proposed path forward.

The lagoons and ponds are not connected with the river on a continuous basis, rather they are connected periodically through inundation during the river flood stages. Sampling conducted to date, indicates the presence of Constituents of Potential concern (COPCs) in sediments at concentrations above state Tier 1 (screening criteria) and of Tier 2 (site-specific) screening criteria presented in the draft 2009 Illinois Environmental Protection Agency (Illinois EPA) *Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments* (TARPS, Illinois EPA, 2009). The COPCs include volatile and semi-volatile organics and metals related to historical discharges from the refinery to the lagoons, adjacent area spills or releases, and possibly historic solid waste disposal on portions of the upland and pond area, by the Village of Hartford, and previous operators of the refinery other than The Premcor Refining Group Inc. (Premcor).

Review of the data indicates that concentrations of COPCs in sediments exceed Tier 2 criteria in several areas of the lagoons, but exceedances appear in the lower layer of the sediment deposits, with less impacted sediment in the upper 3 feet. In addition, in response to Illinois EPA comments on previous documents, some uncharacterized areas exist, such as a former Borrow Pit west of #1 Lagoon.

The Path Forward Approach, to determine remedial needs and select appropriate remedial measures, considers ponds and lagoons separately. The approach to the ponds, which do not have a history of receiving discharges from the former Hartford Refinery Facility (Facility) is guided by the draft 2009 Illinois EPA TARPS document. This guidance document presents a three-tier approach to evaluating sediments including screening against generic Sediment Screening Values (SSVs) in Tier 1, screening against site-specific SSV in Tier 2, and a site-specific evaluation in Tier 3. Existing data suggests that there are discrete areas of sediment exceeding Tier 1 and Tier 2 criteria, triggering the need for Tier 3 evaluation. The approach

to Tier 3 will focus on the option of evaluating risk to aquatic biota via sediment toxicity and biological community integrity evaluations compared to suitable reference sites in accordance with TARPS. The Tier 3 evaluation additionally allows for identification and delimitation of any areas presenting unacceptable risk requiring remedial action.

For the lagoons, which were previously used as receiving water from Facility discharges, the draft TARPS risk-based approach is not applicable to any areas where light non-aqueous phase liquid (LNAPL) is present or suspected, nor to areas where impacted material may exceed the criteria for characteristic hazardous waste. For the lagoons, an engineering approach which considers isolation and containment via Granular Activated Carbon (GAC) amended capping is proposed, applicable to the entire lagoon system even where data do not suggest the presence of LNAPL or other COPCs. Additional remedial options will be evaluated where migrating LNAPL or lead or benzene concentrations exceeding the limit for characteristic hazardous waste. Based on sediment and hydrological characteristics, contamination characteristics, location, and current and future use, this area appears suitable for a remedy involving capping, pending further investigations into geotechnical feasibility.

The Path Forward Approach includes the investigations required to confirm the suitability of the capping/containment approach. Data gaps related to LNAPL mobility, as well as geotechnical and contaminant specific suitability for capping, will also be addressed. Where capping/containment is required, the Path Forward Approach defines the design approach for determining the appropriate cap materials, thickness, and installation requirements based on the preliminary sediment characteristics and additional site testing.

The Path Forward Approach is intended as a road map for evaluating cleanup objectives for the sediment and identifying data gaps that need to be addressed before appropriate remedies can be determined. The goal is to discuss the Path Forward Approach with Illinois EPA and the Toxicity Assessment Unit (TAU) to seek concurrence on the proposed path forward. A Work Plan will be submitted as a Pre-Approval Report under the Strategic Plan with details on investigations and evaluations presented in the Path Forward Approach.

1. INTRODUCTION AND PURPOSE

1.1 Purpose

This *Path Forward Approach for the River Dock Area Sediments* (Path Forward Approach) presents the proposed path forward for addressing potential impacted material[1] and sediment impacts present in the lagoons and ponds located in the River Dock Area of the Former Hartford Refinery Facility (hereafter the Former Hartford Refinery Facility is referred to as the Facility, and the sediment in the River Dock Area is referred to as the Facility Sediments Area [FSA]). In September of 2012, the Group 3 Soil Investigation Report (SIR) was prepared by St. John - Mittelhauser & Associates, Inc. (SMA) (SIWP, SMA, 2012) on behalf of The Premcor Refining Group Inc. (Premcor) in accordance with the procedures under the draft Consent Order (2007) for the Facility, and compliant with the Group 3 Soil Investigation Work Plan (SIWP) (SMA, 2010). The investigation covered the soil and sediment conditions in the River Dock Area, and included investigation of sediment conditions in the lagoons and ponds on the property. The investigation concluded that there were potential concerns in sediment from exposure to constituents of potential concern (COPCs) associated with historical refinery operations by previous refinery owners and operators other than Premcor, as evidenced by exceedances of ecological screening values and other indicators.

The Group 3 SIR was conditionally approved by the Illinois Environmental Protection Agency (Illinois EPA) on June 30, 2015. The Agency conditions specify additional investigations and revised the applicable screening values. The Path Forward Approach is intended to further address these conditions and the sediment contamination in the FSA.

A Draft *Remediation Approach for the River Dock Area* (hereafter referred to as the Draft Remediation Approach), was submitted on May 12, 2017, as part of the negotiations for a new draft Consent Order, which included re-evaluation of Tier 1 and Tier 2 screening levels for sediment based on Illinois EPA comments for the Group 3 SIR.

A draft of the Path Forward Approach, was submitted in January 2018, and was reviewed by Illinois EPA. General comments on the recommended approach were submitted by Illinois EPA on March 1, 2018, followed by a site visit and follow-up meeting in Hartford on March 13, 2018, where the site features were reviewed and the path forward discussed further. In response to the Illinois EPA recommended approach, Premcor presented a follow-up letter outlining a revised approach on April 5, 2018. Illinois EPA provided further comments on

[1] Solids resulting from the discharge from the former Facility discharge point are here termed "impacted material". The waste material was subsequently mixed with and overlain by depositing sediment resulting in the current conditions.

April 19, 2018. These documents are included as Attachment 1. This Path Forward Approach incorporates the resolution of comments by the Agency and suggestions during this review period.

The purpose of this document is to present an outline for the path forward for the sediments discussed in the Draft Remediation Approach and to address data gaps and observed exceedances of Tier 1 and Tier 2 sediment criteria in the FSA. It specifically considers the following:

- Reviews the data available to date for the nature and extent of COPCs in the sediment;
- Conducts an updated and revised Tier 2 evaluation on existing sediment data to refine the extent of concerns;
- Proposes sampling and analysis of sediment to address data gaps related to the former Borrow Pit;
- Proposes the conceptual outline for Tier 3 risk-based procedures identified in the Draft Remediation Approach and to be applied in the Ponds;
- Proposes a conceptual approach for addressing concerns in the lagoons, where the risk-based approach from the draft TARPS is not applicable or inadequate, based on an engineered remedy of isolation and containment (subaqueous Granular Activated Carbon (GAC) capping);
- Proposes data needs to allow determination of the geotechnical feasibility of isolation/containment remedies to such areas;
- Proposes an approach to identify migrating light non-aqueous phase liquid (LNAPL) or materials that exceed the limit of a characteristic for hazardous waste that would require additional remedial option considerations; and
- Proposes monitoring and site institutional controls based on the selected remedies.

1.2 Project Description and Areas of Concern

Investigations and interim remedial measures at the Facility have been underway in accordance with Section VIII (B)(1)(c)(3) and Appendix C of the draft Consent Order (2007) being negotiated with the State of Illinois by Premcor.

The River Dock Area was investigated as part of the site wide soil investigation, and included evaluation of the FSA. This document focuses on the sediment in the lagoons and ponds (i.e., the FSA). There are three lagoons (#1, #2, and #3), three ponds (#1, #2, and #3)

and a flooded former Borrow Pit present in the River Dock Area (Figure 1). The FSA is depicted as green hatched areas in Figure 1.

1.3 Identification of Constituents of Potential Concern

The COPCs are defined as those compounds that are listed in Appendix A of the draft Consent Order (the "Skinner List" compounds) in accordance with the Group 3 SIWP (SMA, 2010) and include:

- Volatile Organic Compounds (VOCs) (Benzene, toluene, ethylbenzene, total xylenes [BTEX], selected chlorinated VOCs, styrene, and methyl tert-butyl ether [MTBE]);
- Semi-volatile organic compounds (SVOCs) (phthalates, phenols, pyridine, quinoline, 1,4-dioxane, and fourteen (14) polycyclic aromatic hydrocarbons [PAHs]);
- Metals (antimony, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, mercury, nickel, selenium, silver, vanadium, zinc, and
- Cyanide (total).

These COPCs were evaluated in the Group 3 SIR, and all proposed additional evaluations will focus on those that reported exceedances for the applicable Tier 1 Sediment Screening Values (SSVs)[2] and the Tier 2 SSVs identified in the Draft Remediation Approach.

The Draft Remediation Approach (SMA, 2017), evaluated available data against Tier 1 and calculated Tier 2 SSVs in Table 2-1 of this document and identified preliminary Tier 2 exceedances. The following table summarizes the COPCs with Tier 1 exceedances that will be considered further in the sediment evaluation; based on samples from any depth interval (Table 1).

The distribution of COPCs was unequal between the lagoons and the ponds. In the pond sediments, only two VOCs (2-Butanone [MEK] and carbon disulfide) and five metals (chromium, cobalt, lead, nickel, and zinc) exceeded the Tier 1 SSVs. All COPCs, except cobalt, were observed above Tier 1 SSVs in the lagoon sediments.

[2] SSVs are equivalent to the Sediment Remediation Concentrations (SRCs) used in Draft TARPS (Illinois EPA, 2009).

Table 1. Sediment Screening Value Sources and Evaluation Needs

COPCs exceeding Tier 1 SSVs (including non-detects)	SSVs applied in Draft Remediation Approach [1]	Additional Evaluation Needs
VOCs		
2-Butanone (MEK)	Region 5 ESL**	Comparison against a Tier 2 SSV
Benzene	Tier 2*	Presumptive Tier 3 need
Carbon Disulfide	Region 5 ESL**	Comparison against a Tier 2 SSV
Ethylbenzene	Tier 2*	Presumptive Tier 3 need
Toluene	Tier 2*	Presumptive Tier 3 need
Xylenes (total)	Tier 2*	Presumptive Tier 3 need
SVOCs and PAHs		
1,4-Dioxane	Region 5 ESL**	Comparison against a Tier 2 SSV
2,4-Dimethyl-phenol	Region 5 ESL**	Comparison against a Tier 2 SSV
4-Nitrophenol	Region 5 ESL**	Comparison against a Tier 2 SSV
Acenaphthene	Tier 2*	Presumptive Tier 3 need
Anthracene	Tier 2*	Presumptive Tier 3 need
Benzo(a) anthracene	Tier 2*	Presumptive Tier 3 need
Benzo(a)pyrene	Tier 2*	Presumptive Tier 3 need
Diethyl phthalate	Region 5 ESL**	Comparison against a Tier 2 SSV
Di-n-butyl-phthalate	Region 5 ESL**	Comparison against a Tier 2 SSV
Fluoranthene	Tier 2*	Presumptive Tier 3 need
Fluorene	Tier 2*	Presumptive Tier 3 need
Naphthalene	Tier 2*	Presumptive Tier 3 need
m- and p- Cresol	Region 5 ESL**	Comparison against a Tier 2 SSV
Phenanthrene	Tier 2*	Presumptive Tier 3 need
Phenol	Region 5 ESL**	Comparison against a Tier 2 SSV
Pyrene	Tier 2*	Presumptive Tier 3 need
Inorganics		
Arsenic	Tier 1 CV***	Comparison against a Tier 2 SSV
Chromium	Region 5 ESL**	Comparison against a Tier 2 SSV
Cobalt	Region 5 ESL**	Comparison against a Tier 2 SSV
Lead	Tier 1 CV***	Comparison against a Tier 2 SSV
Mercury	Region 5 ESL**	Comparison against a Tier 2 SSV
Nickel	Tier 1 CV***	Comparison against a Tier 2 SSV
Silver	Region 5 ESL**	Comparison against a Tier 2 SSV
Zinc	Tier 1 CV***	Comparison against a Tier 2 SSV

* Site-specific Tier 2 SSV calculated based on equation and data in TARPS applying the lowest site-specific organic matter fraction of 0.052 and converted to f_{oc}

** U.S.EPA Region 5 ESL (U.S.EPA 2003a) applied when no Tier 1 value is presented in draft TARPS

*** Comparison value indicated by Illinois EPA in June 30. 2015 compliance letter to Premcor

SSV = Sediment Screening Value (equivalent to the Sediment Remediation Concentration (SRC) in draft TARPS)

ESL = Ecological Screening Level

CV = Comparison Value

[1] SMA, 2017 Draft Remediation Approach for the River Dock Area

1.3.1 Light Non-Aqueous Phase Liquids

In addition to the COPCs, identified above, the Group 3 SIR reported the potential presence of LNAPL in portions of the lagoon sediments. This potential presence arose from visual observations of LNAPL, referred to as free product, in the extracted sediment cores during sampling, or as reported sheens generated in the jar shake test.

Illinois Administrative Code (IAC) 35 742.200 provides the following definition of free product: "Free Product means a contaminant that is present as a non-aqueous phase liquid for chemicals whose melting point is less than 30 degrees Celsius (e.g., liquid not dissolved in water)." With respect to the potential risk of LNAPL migration in sediment, the term "free product" is too broad-based and refinement of this term is necessary to understand if there is a risk associated with the LNAPL to migrate. As such, the observation of free product in sediment cores, or during shake tests, is interpreted to indicate the potential presence or absence of LNAPL as a separate phase liquid. The observation of sheen alone in sediment cores or in shake tests is interpreted to indicate the presence of sheen (and not free product).

In this Path Forward Approach, to address sediment impacts, the distinctions between LNAPL and free product observations in sediment cores are critical to assessing remedial needs. This is because the definition of free product within IAC 35 742.200 is not specific enough to understand potential exposure pathways, and developing the proper approach for capping and isolation as necessary. Therefore, the type of free product (aka, LNAPL presence) can be further defined as follows (ITRC, 2009, 2018):

- Residual LNAPL (immobile): LNAPL that is present as a separate phase liquid, but is at low saturation and thus is trapped within sediment pore space by capillary forces and cannot migrate laterally or vertically under the conditions reasonably foreseen at the FSA.

- Mobile LNAPL: LNAPL that is present as a separate phase liquid, but lacking sufficient saturation or site conditions for lateral or vertical migration beyond the established extent given conditions reasonably foreseen at the FSA.

- Migrating LNAPL: LNAPL at higher saturations than mobile LNAPL which under conditions reasonably foreseen at the FSA may undergo lateral and/or vertical migration beyond the existing extent due to capillary or other forces.

An evaluation of the LNAPL is required to determine if the LNAPL body is migrating. It is not uncommon for LNAPL within a total LNAPL body footprint to migrate locally within the interior of the LNAPL body while the overall LNAPL body is stable. Such a condition is not considered "migrating LNAPL." Migrating LNAPL is present if the LNAPL body may expand beyond its three-dimensional footprint under conditions reasonably foreseen at the FSA.

Any migrating LNAPL, if present, would require additional considerations to determine if GAC capping is adequate to contain it vertically and/or horizontally. If not adequate, additional remedial evaluation would be needed to determine the appropriate remedy to prevent such migration.

Preliminarily, material described as "free product" was considered to be potentially mobile LNAPL for purposes of this evaluation while sheens were not. This Path Forward Approach will categorize LNAPL in cores collected from the "worst case" locations near the former discharge point to #1 and #2 Lagoons, as residual, mobile, locally migrating, or footprint expansion migrating LNAPL. Confirmation of migrating LNAPL would trigger additional remedial option evaluation.

1.3.2 Material Exceeding Criteria for Characteristic Waste

There has been no confirmation of the existence of any material exceeding criteria for a characteristic waste in the lagoons. However, nearest the former discharge point to #1 and #2 Lagoons, elevated concentrations of lead and benzene have been reported. It is necessary to identify if these concentrations in fact exceed the criteria for characteristic waste (i.e., leachates exceeding the Toxicity Characteristic Leaching Procedure [TCLP] limits). If it is determined that the material exceeds the criteria of a characteristic waste, additional remedial option evaluation would be needed to ensure that the material is properly managed.

1.4 Proposed Approach

The proposed approach to address the contamination present in the FSA is based on the data presented in the conceptual site model (CSM) in Section 2.3 and applicable regulations detailed in Section 3.0. The approach is summarized in the flowchart included as Figure 2.

The fundamental approach to addressing the FSA is premised on a sequential approach in accordance with the following steps, oriented towards identifying the most efficient method to achieve the goal of protecting human health and the environment:

1. Determining the nature and extent of any COPCs in the previously unexamined former Borrow Pit.

2. Applying the risk-based approach to sediments in accordance with the Illinois EPA draft TARPS to the ponds, where the nature of the COPCs allows application of this tiered approach. It is expected that, based on current site understanding, TARPs approaches may adequately address the 3 ponds.

3. The draft TARPS approach is inapplicable to the lagoons, as they have a history of use as receiving water from Facility discharges and investigative work and have reported the existence of LNAPL. An engineered remedy based on isolation and

containment via GAC amended sediment capping is proposed. The use of subaqueous capping at contaminated sediment sites is well established nationally and regionally[3]. Subaqueous capping with conventional and/or amended cap materials is likely to be effective considering the sediment physical properties, local hydrology, land use, and the nature and extent of the COPCs.

4. The nature and characteristics of the proposed capping depends on the nature and behavior of COPCs in addition to the physical properties of the sediment. A GAC amended cap is likely to contain COPCs and non-migrating LNAPL. If COPCs are present in forms capable of migration (i.e., migrating LNAPL) through the interstitial pore space or into the water column, or having concentrations exceeding the criteria for a characteristic waste, additional remedial options will be evaluated as needed (additional evaluation may consider if GAC capping is adequate, if added amendments suitable for containing any contaminant migration and alternate remedies such as in-situ stabilization and/or removal will be proposed). In all cases, the cap will be designed to match the existing site hydrologic conditions and geotechnical properties of the sediments.

5. In addition to capping the sediment bed of the lagoons, the remedy will consider the need, if any, to further isolate, contain or reinforce the lagoon shorelines to preserve the integrity of the cap, prevent recontamination, or prevent migration out of the lagoons.

6. If conditions are not suitable or applicable for these approaches, additional remedies will be considered as needed. This may apply if migrating LNAPL is present and cannot be adequately contained by the proposed GAC amended cap; if characteristic waste is found and cannot be adequately mitigated by the proposed GAC amended cap; or if the geotechnical evaluation determines that capping is otherwise not suitable or applicable. If any of these conditions are found, alternative remedial plans will be developed and submitted to Illinois EPA.

This Path Forward Approach presents the overall proposed approach and identifies the key data gaps to be filled in order to provide the necessary data to evaluate the feasibility of addressing COPCs at the FSA.

[3] A recent example of a sediment site from Illinois where capping of PAH contaminated sediment was implemented is the South Slip at the former Wisconsin Steel Works site on the Calumet River (Arcadis, 2012).

2. FACILITY BACKGROUND

2.1 Facility Location and Description

The Facility comprises three separate parcels of land totaling approximately 400 acres (Figure 1). The Path Forward Approach focuses on part of the area referred to as the Premcor River Dock Area, located west of the Village of Hartford between the United States Army Corp of Engineer's (USACE's) flood control levee and the Mississippi River and consisting of three connected lagoons and three isolated ponds. The major site features of this parcel, are shown in Figure 3. This parcel is approximately 130 acres and is mostly undeveloped, except for a River Terminal for barge loading and unloading operations. The southwest corner of this parcel is leased to National Marine Company and Nicor National Illinois Inc. The Village of Hartford owns a small parcel of land directly south of Hawthorne Street northeast of Pond #3. The Village of Hartford formerly operated a water treatment facility on this parcel which has since been demolished. The system was a combined waste water and storm water system.

The total area of the lagoons and ponds is approximately 34.5 and 19.1 acres, respectively. In addition, the former Borrow Pit occupies 1.4 acres. The lagoons and ponds originated as borrow pits during the construction of the Mississippi River flood control levee circa 1955. Beginning in 1956 and continuing through circa 1981, the three lagoons were used by former facility owners and operators as part of the waste water treatment system, functioning as de facto oxidation lagoons. The ponds were not utilized as part of the wastewater management system or for any other purpose associated with the refinery operations. The former Borrow Pit is hydraulically connected to #1 Lagoon during high water, but it remains unclear if the Borrow Pit has been impacted in a manner consistent with the lagoons.

2.2 Lagoon and Pond History and Hydrogeology

As previously discussed, the lagoons and ponds have their origin as borrow pits for material used to construct the flood control levee, and therefore, are artificial creations and are not necessarily comparable to natural sloughs and backwaters formed by the Mississippi River.

Beginning in circa 1956, the then refinery operator started using the lagoons as "oxidation lagoons," with refinery effluent pumped from the Facility to a discharge point between the #1 and #2 Lagoons. The lagoons drained to the river via an exit drain or ditch located between the #1 and #2 Lagoons (see Figure 3). This created a circulation of waste water primarily in the #1 and #2 Lagoons (see Figure 4), although a connection to #3 Lagoon existed. Around 1968 the discharge from the lagoons was rerouted to flow from #1 Lagoon to an oil skimmer and then to #2 and #3 Lagoons, exiting the #3 Lagoon via pipes and ditches to the Mississippi River, thereby presumably expanding the waste water residence time. The

refinery owner at the time constructed a waste water treatment plant on the Facility in 1975. In 1981 discharges to the lagoons were discontinued for the most part and there have been no routine discharges to the lagoons since then[4]. The lagoons, therefore, experienced discharges for approximately 22 years, but #3 Lagoon has had less flow-through.

The ponds never were connected to the waste water flow or discharges from the facility owner at the time, but as reported in the Group 3 SIR, they may have been affected by an adjacent closed landfill previously operated by the Village of Hartford (the green hatched portion in Figure 3) in that area (SMA, 2012). The landfill was covered and closed in accordance with regulations per a letter from Illinois EPA dated July 29, 1970 (Illinois EPA, 1970). A site inspection along with the Agency in March 2018 showed no indication of current migration to the pond.

The lagoons and ponds currently have no active use, and are located on private property restricted to the public, with "No Trespassing" signs posted. The premises are under 24-hour guard, as the River Dock Area is, and will remain an active industrial facility. Trespassers from the land side have not been observed. Occasional trespassers from the river side have been observed, and the persons involved were observed and expelled by the guards. The primary land use for the lagoons and ponds, under current and reasonably anticipated future conditions, would be under the category of "conservation property" (35 IAC 742.200) applicable to land that is not currently under any defined category, with a presumptive primary use for wildlife.

The active floodplain in the River Dock Area consist of alluvial clayey silt and silty clay. As reported in the Group 3 SIR, the FSA lagoons and ponds contain approximately 3 to 7 feet of standing water, overlying depositional silty sediments ranging from approximately 1 to 8 feet thick. The sediment rests on native alluvial silty clay to clayey silt (the A Clay lithologic unit described in the Group 3 SIR). This clayey layer ranges from 12 to up to 40 feet in thickness under the waterbodies. The fine-grained deposits in this lithologic unit act as an aquitard and upwelling of groundwater into or subsurface migration of water out of the lagoons and ponds is not expected but will be verified as part of the proposed evaluation.

None of the ponds or lagoons have natural outflows or inflows, except possibly via low lying areas and ditches when the river stage is high. This conclusion is based on anecdotal reports and aerial photographs of visible in-flow along ditches and low-lying areas when the river rises. Inundation occurs frequently, and is presumably a major source of surface water exchange and sediment deposition. The exact hydrological cycle has not been evaluated.

Suspended solids carried by the flood waters deposit on the upland and in the lagoons and ponds. The sediment deposition rates and thickness across the FSA is dependent on the inundation frequency and river suspended solids concentrations. Once the flood waters

[4] Periodic upsets by Apex did occur between 1981 and 1987 resulting in releases to the lagoons

recede, suspended sediment in the stagnate floodwaters settles out into the ponds and lagoons. The thickness of deposition is based on the volume of trapped suspended solids, which is related to the depth of water in discrete locations in the ponds and lagoons.

Other sources of sediment contribution to the ponds and lagoons is from erosion of the surrounding land during precipitation and runoff.

Potential groundwater upwelling into the ponds and lagoons will be considered as part of the *Group 3 Groundwater Investigation Work Plan* (SMA, 2015) but is not expected due to the thick (20 to 40 feet) A Clay deposits underlying the lagoons and ponds, functioning as an aquitard. Similarly, lateral migration of COPCs out of the lagoons towards the aquifer or the Mississippi River is not expected to be a significant pathway based on the current CSM.

The biological habitat present in the ponds and lagoons has not been studied in any detail. The ponds and lagoons support aquatic invertebrates adapted to the relatively stagnant conditions. Fish (carp have been observed) are expected to immigrate from the river during periods of inundation. Turtles and amphibians are likely present. These waterbodies are also likely to be a resource for aquatic birds, muskrats, and other water associated wildlife. Terrestrial mammalian wildlife is present (coyote and deer have been observed) as the area is a relatively undisturbed urban corridor area even though active industrial facilities in the surroundings limit access.

2.3 Conceptual Site Model

Based on the FSA knowledge currently available, a human health and ecological risk CSM has been developed. The CSM (Figure 5) is an iterative concept, and is subject to modification and updating as additional FSA information is obtained. The CSM presents the FSA conditions as described in this section, and further considers the potential exposure pathways at the FSA.

2.3.1 Source of COPCs

The lagoons were previously repurposed as part of a waste water treatment system functioning as "oxidation lagoons" receiving waste water flows from the Facility. Advantage was taken of these pre-existing borrow pits from the construction of the river levee to reduce the discharge of pollutants to the Mississippi River by allowing settling and oxidation of COPCs prior to discharge. However, the lagoons were never specifically constructed or intended for this purpose. The material currently present in the lagoons and ponds was characterized in the Group 3 SIR as various proportions of silt and clay with some fine sand, sometimes with visual observations of contamination and free product primarily in the deeper layers.

The COPCs present in the lagoon sediments includes various organics, inorganics as well as an indication of hydrocarbon residues (e.g., LNAPL and sheens). The impacted material from the former discharge are overlain by depositional sediment with much lower concentrations of COPCs, although at a few locations lower concentrations of COPC and/or sheens have been attested in shallower (top 3 feet) sediment.

However, additional evaluation in the context of contaminant source and LNAPL determination, per 35 IAC 742.305, will be required to evaluate potential presence of characteristics of chemical constituents in sediment exceeding the limit for a hazardous waste.

2.3.2 Sediment Characteristics

The CSM considers the primary source of COPCs to be the historical discharges to the lagoons from the Facility by previous owners and operators other than Premcor. Pond #3 may have been affected by the adjacent closed landfill, used in the past by the Village of Hartford and past owners and operators of the refinery, other than Premcor. However, the ponds were never recipients of direct discharges from the Facility. Ongoing sources of contamination are expected to be minimal: groundwater upwelling is likely incomplete as the native fine-grained deposits underlying the ponds and lagoons function as aquitards. Limited runoff and erosion from the surrounding surface of the River Dock Area are potential sources, but expected to be minor due to the well-developed vegetated surfaces. Therefore, the primary concern for the lagoons and ponds are the residual COPCs present in sediment.

Sediment has accumulated over time on top of the original impacted material deposited during the prior use of the lagoons by the Facility. The depth of sediment was reported in the Group 3 SIR as:

- #1 Lagoon – 4.4 to 6.7 feet black silt, overlain by 3.8 to 5 feet of water.
- #2 Lagoon – 6.9 to 8.9 feet black silt, overlain by 4.8 to 8.8 feet of water.
- #3 Lagoon – 6 to 8 feet grey or black silt, overlain by 4.1 to 7.5 feet of water.
- Pond #1 – 4.6 to 7.9 feet of grey or brown silt, overlain by 4.8 to 5.3 feet of water.
- Pond #2 – 1.3 to 3.1 feet grey or brown silt, overlain by 3.6 to 3.9 feet of water.
- Pond #3 – 2.9 to 5.3 feet grey or black silt, overlain by 2.3 to 3.5 feet of water.

As the ponds never received any discharges, it is likely that the bulk of the sediment load to these ponds and lagoons is from river sediment, dust, and biological material.

The sediments in the lagoons range from approximately 1 foot to almost 8 feet in thickness based on the boring logs. This result suggests that contaminated material, directly resulting from the historical waste water discharge to the #1 and #2 Lagoons, is limited in thickness to a few feet at most, located near the bottom of the sediment column, directly on the underlying native clayey soil, as can be seen in the boring logs from existing sediment sampling. Some limited vertical and horizontal migration within the confines of the lagoons is possible and is further addressed as part of the data gaps evaluation.

2.3.3 Sediment Stability

The most impacted sediment are the deepest sediments, immediately overlying the native clayey soil. This condition is likely because the discharges from the Facility occurred in the mid-1950s until the 1980s, starting soon after construction of the borrow pits. Since that time, the periodic flooding and runoff has added layers of sediment over the COPC contaminated sediment. The CSM considers the lagoons and ponds as depositional areas which are not expected to erode or be remobilized under reasonably expected conditions. This Path Forward Approach includes proposed measures to confirm this observation.

The upper, less impacted sediments have the potential to provide natural containment of some or all the COPCs and LNAPL identified in the ponds and lagoons. The sediments are mostly silts and the majority of the COPCs and LNAPL are in deeper layers. As depositional materials, the in-situ densities are low and require further geotechnical testing before concluding they possess the appropriate containment properties. To stabilize the existing sediments in the lagoons, subaqueous capping is proposed. The confinement loading (due to the capping materials) will consolidate the surface sediments, increasing density, percent solids, and undrained shear strength, while decreasing moisture content and hydraulic conductivity overall improving the physical properties of the sediments. The subaqueous capping layer can be designed to resist water flow forces resulting from river flooding. Armoring can further improve the confinement ability and stability of the cap and sediments.

2.3.4 Migration Potential

Vertical Migration

As previously discussed, the COPCs and LNAPL appear to be largely confined to the deep layers of the sediment in #1 and #2 Lagoons, although lower concentrations of some COPCs including PAHs and ethylbenzene have been detected in the top 3 feet of sediment in the lagoons. It remains unclear if any COPCs have reached the biologically active zone where they would be susceptible to migration across the interface to surface water. This pathway is indicated as dashed lines in the CSM (Figure 5). This Path Forward Approach proposes a remedy of amended subaqueous capping for the lagoons to ensure continued absence of exposure to COPCs or migrating LNAPL.

Potential movement of COPCs in the interstitial pore water within the sediment is primarily driven by any sorption and groundwater advection of solubilized COPCs. The CSM for the lagoons and ponds suggests groundwater flow is low and advection, therefore weak, as the underlying thick clay layers function as aquitards, reducing or eliminating groundwater flux and therefore advection. COPCs noted in shallower sediment may be the result of this limited advection or diffusion or via deposition of other impacted sediment. Migration of any dissolved organic COPCs will also likely be attenuated (sorption process) due to the presence of organic carbon in the sediment

The absence of significant groundwater flux into the lagoons and ponds also suggest that flux out of the lagoons and ponds, towards the sand aquifer (Main Sand) underlying the A Clay, is also not likely to be significant. Analytical data from core samples collected in the underlying native soils and reported in the Group 3 SIR, confirm that COPCs have not moved far into the underlying clayey deposits. The underlying native clay soils are considered further in the Draft Corrective Action Objectives Report for the River Dock Area (SMA, 2017b).

There is the potential for changes in pore pressures and hydraulic gradients to occur during flood events and sediment deposition. An increase in water depth would create a larger downward gradient within the sediment. As more and more sediments are deposited due to flood deposition there is the potential to increase pore pressures, which could cause limited downward, lateral, or upward movement of interstitial pore water. Based on the lagoon and pond bottoms consisting of impermeable clayey deposits, the interstitial pore water during consolidation would most likely have to move laterally or upward. The consolidation process, due to sediment deposition, would be the same for weight imposed by a cap construction and future sediment deposition. The potential and magnitude of interstitial pore water migration, due to sediment deposition and cap construction, will be evaluated.

The potential for LNAPL to migrate laterally or vertically under current conditions and/or following a containment (cap) remedy is not known and is proposed for evaluation as part of the additional sampling and analysis described in this Path Forward Approach. This approach will consider several lines of evidence including hydrogeologic analysis, visual observations, and laboratory testing to understand if observed LNAPL is migrating, to determine the conditions under which migration may occur, and if these conditions are sufficient for the migrating LNAPL to migrate to the lagoon surface water or out of the lagoons, either vertically or laterally. Further investigation of LNAPL migration potential is proposed in areas of "worst case" free product observations from sediment cores near the former discharge point reported in the Group 3 SIR (SMA, 2012).

Lateral Migration

Lateral migration of COPCs in the sediments is expected to be limited. Most, if not all, of the lagoon side walls consist of the same clayey soils as are present below the lagoons, as

they were originally excavated within this material. There does not seem to be a significant pathway for COPCs contained in the deep sediment to be significantly mobilized in a lateral direction. The clayey soil sidewalls indicate that migration of COPCs, via groundwater diffusion or advection, out of the lagoons towards the Mississippi River is minimal or absent.

Shoreline borings will be performed to document the presence of an impermeable clayey soil layer surrounding the deeper water areas of the lagoons, and to document soil conditions where there has been extensive disturbance from excavations related to historical conduits. The Path Forward Approach includes evaluation of geotechnical characteristics and groundwater elevation along the perimeter of the Lagoons to supplement the existing data.

The containment of sediment within the lagoons is also predicated on the lagoon side slopes remaining stable under static low water conditions, flooding events, and disturbances during remedial action. Therefore, the lagoon side slopes will be addressed in the Path Forward Approach to provide a long term stable horizontal boundary for the lagoons.

2.3.5 Exposure Pathways and Receptors

Aquatic biota exposure in the ponds and lagoons is a complete pathway. The impacted medium of concern is the sediment. The ongoing investigation process has not included surface water as an exposure medium for evaluation. This was due to the absence of any ongoing discharges from the Facility to the lagoons and ponds. The waterbodies are subject to periodic flushing during flooding. Any Facility related COPCs in the surface sediment (not counting any minor influx via runoff) would be from migration from the historical sediment contamination. Sediment is therefore the primary medium of concern.

The relevant exposure depth of sediment is limited to the Biologically Active Zone (BAZ)[5] (U.S.EPA, 2015). Aquatic biota exposure to deeper sediment is an incomplete exposure

[5] In freshwater systems, only the surface layers of sediment support aquatic life. Deeper sediment is generally anoxic and reducing and not conducive to non-bacterial life. This surface layer is termed the "biologically active zone" (BAZ). Exposure to contaminants to aquatic life is limited to the BAZ. Deeper sediment is not a current exposure pathway (although could be a potential future pathway if such sediments were to be remobilized).

Per recommendations in U.S. EPA (2015), the guidelines for sampling BAZ in lake sediments is to target depths of 15 cm to 20 cm, and in streams and rivers with fines, 15 cm to 25 cm, which is based on the depth to which benthic biota may penetrate. The BAZ may in practice be considerably less than this value in low flow, low oxygen environments such as in the ponds and lagoons in the River Dock Area.

However, for the purposes of the ongoing investigations, the BAZ should be considered as 0.5 foot (15 cm) at the lower range of BAZ zones because of the likelihood of anoxic conditions near the surface in these normally stagnant water bodies. However, practical sampling considerations may need to include 0 to 1 foot, which likely overstates the BAZ.

pathway. It is covered by less impacted sediment and would not be expected to become exposed under reasonably foreseeable circumstances.

The primary receptor of concern is the aquatic biota. Most biota in these relatively shallow waterbodies are expected to experience exposure to the BAZ sediment. Direct contact with water column, although complete, is considered insignificant relative to sediment exposure as most of the COPCs are expected to reside in the sediment.

Wildlife, such as waterfowl, amphibians, and other aquatic wildlife, may use the ponds and lagoons for drinking water and some food resources (e.g., macroinvertebrates may be a food source for waterfowl). The exposure, while complete, will be considered insignificant relative to aquatic biota exposure which represents the maximally exposed group[6].

Human use of the lagoons and ponds is also considered in the CSM and is further discussed in Section 5. Limited use for fishing is theoretically feasible, although infrequent, either via access by boat during Mississippi flooding (an unlikely event due to the dangerous conditions and currents during such events) or shore access by trespassing from the levee or Mississippi River. Fishing frequency is therefore expected to be limited and is considered complete, but insignificant. Access from land entails trespassing against clearly marked private property boundaries and "no trespassing" signs. The River Dock Area is guarded 24 hours a day, as it is an active industrial facility, and any trespassers are identified and expelled. While exposure to trespassers is not excluded, the frequency and duration of their exposure also would be limited. Trespassers in general may visit the area, but are not expected to linger due to the active and guarded nature of the area. This pathway is complete, but insignificant.

Surface water is a potentially complete pathway if COPCs migrate (via advection, ebullition mediated transport, or other mechanism) through the sediment column, across the sediment/water interface and into the water column. The Group 3 SIR did not identify surface water as a medium for further evaluation and therefore, there has been no analysis of surface water. The basis for this was the apparent absence of migration of COPCs through the water column deduced from the low concentration of COPCs in surface layers of sediment. There appears to be minimal presence of organic or metallic COPCs in the surface water/sediment interface area available to migrate into the water column. Please refer to Section 2.3.4.

Unless the surface sediment contains levels of COPCs considerably exceeding Tier 2 SSVs, there is unlikely to be significant loading to the surface water. Therefore, the surface water pathway is considered complete, but insignificant. No further direct evaluation of surface

[6] See Section 2.3.7 related to bioaccumulation of COPCs.

water conditions is proposed for this Path Forward Approach except as needed for remedy monitoring as discussed in Section 7.

2.3.6 Bioavailability

Bioavailability describes the degree to which COPCs present in sediment are available for exposure to the receptors. Bioavailability in sediment may be highly variable, and not all the COPCs present are bioavailable. The draft TARPS Tier 2 evaluation, described in this document, incorporates bioavailability of organics: the fraction organic carbon (f_{oc}) adjustment reflects the process where organic COPCs are tightly held to organic carbon content of the sediment, and thereby are considered unavailable in accordance with Equilibrium Partitioning (EqP) (U.S.EPA 2003). The Tier 2 SSVs are based on the expected bioavailable fraction of organics considering the typical site specific f_{oc} for unimpacted sediment, applying either the recommended values in draft TARPS (for selected PAHs) or applying the same approach based on literature values for other organic COPCs.

The draft TARPS Tier 2 evaluation does not consider COPCs that do not respond to equilibrium partitioning, in this case primarily metals. There are various techniques available to determine the bioavailability of metals, especially divalent metals (cadmium, lead, nickel, zinc, copper, and mercury) where bioavailability in sediment is determined by calculating the ratio or molar difference of acid volatile sulfides (AVS) to simultaneously extractable metals (SEM) (U.S.EPA, 1991). AVS have a high affinity for binding divalent metals, and therefore serves to make them unavailable. AVS are commonly present in low redox sediments (such as anaerobic environments). The portion of metal ions that are not bound to sulfide are considered bioavailable (when present in the BAZ).

The sediment contamination profiles in the lagoons, developed from the Group 3 SIR data (Figure 6 and 7), and the data tables (Attachment 1) indicate that metal exceedances of Tier 2 SSVs (i.e., the probable effect concentrations) include lead (HQ_{max}[7] up to 62), mercury (HQ_{max}=1), zinc (HQ_{max}=1), and chromium (HQ_{max}=3) in #1, #2, and #3 Lagoons. All the exceedances are found in the deeper sediment layers where contaminated material is present and none in the surficial layer.

As elevated metals concentrations appear to be absent in surface sediment, evaluation of bioavailability by the AVS/SEM method will not be considered in the Path Forward Approach. However, if the sampling in the BAZ were to identify elevated metals, such analysis may be appropriate to implement.

[7] HQ stands for Hazard Quotient. The value represents the ratio of the observed concentration and the Tier 2 SSV and is unitless. HQ_{max} is the maximum HQ. Figure 6 shows the HQs for the locations along the transects. Attachment 1 shows exceedances as highlighted concentrations and not as HQ.

The concentration of lead and benzene in sediment from locations RDED-09 and RSED-11, located nearest the former discharge point, are sufficiently high to suggest they could exceed the limit of a TCLP test. The Path Forward Approach proposes to determine if these "worst case" samples exceed the criteria of a hazardous waste.

2.3.7 Bioaccumulation

Bioaccumulation of COPCs is an issue primarily for receptors exposed via the food web. Additionally, this bioaccumulation may biomagnify through the food web affecting higher trophic levels and human consumers of fish. Bioaccumulative constituents of concern (BCC) have been defined in 35 IAC 302.501(c)[8] as chemicals that bioaccumulate with an effective bioaccumulation factor greater than 1,000 and a half life in water greater than 8 weeks. This group includes chlorinated and other pesticides, various chlorinated benzenes, polychlorinated biphenyls (PCBs), dioxins, and mercury. Except for mercury, these BCCs are not part of the chemicals expected or evaluated as Facility-related. The COPCs identified at the FSA are not generally considered bioaccumulative. For example, PAHs do not bioaccumulate in vertebrates as these animals are able to efficiently eliminate PAHs. Of the metals, mercury is considered strongly bioaccumulative compared to the other metals but is typically present at low concentrations. The other metals identified with elevated concentrations, such as zinc and lead, are not generally considered bioaccumulative.

The extent of mercury contamination and potential bioaccumulation was evaluated in the Group 3 SIR. Mercury is found in most sediment samples at concentrations in the 0.03 to 0.15 mg/kg range, which is below the Tier 2 levels of concern; and the even distribution included in unaffected ponds appears consistent with background levels. However, two locations, RSED-09 and RSED-11 have concentrations of 1.5 mg/kg which exceeds the Tier 2 SSV's. The form of this mercury is not known, however elemental mercury was not used in the refining process and, therefore, is not expected to be present as it has not been noted in other Facility investigations. These elevated concentrations are co-located with other elevated chemicals in deeper sediment near the former discharge point and do not appear to be present in biologically active sediment subject to potential exposure. This absence will be confirmed as part of addressing data gaps proposed in this Path Forward Approach.

[8] The BCCs were defined for application in the Great Lakes, and are specifically listed for use in Lake Michigan in IAC. However, the listing and definition has general applicability and is also applied here.

3. APPLICABLE REGULATIONS

3.1 Illinois Sediment Regulations

3.1.1 TACO Guidance on Sediments

The *Tiered Approach to Cleanup Objectives* (TACO) codified as 35 IAC 742 provides limited specific guidance for sediments. 35 IAC 742.105(d) notes that "*this Part may be used to develop remediation objectives to protect surface waters, sediments or ecological concerns ... and as approved by the Agency*" but provides no further guidance.

In 35 IAC 742.115(c) it is stated that land use shall be classified as part of the TACO process. The applicable land use for the ponds and lagoons may be considered as "conservation property", where "conservation property means "*any real property for which present or post-remediation use is primarily for wildlife habitat*" (35 IAC 742.200). Remediation Objectives for conservation properties are developed under Tier 3 (35 IAC 742.110(d)).

Additional Illinois guidance that may be applicable includes 35 IAC 742.305 defining contaminant sources and free product determination for purposes of exposure route evaluation.

3.1.2 Preferred Remedy for Lagoons

Draft TARPS focuses on individual chemicals from petroleum releases and specifically focuses on PAHs and BTEX, key components of petroleum releases. The methods by extension can be applied to other organics. This Path Forward Approach also proposes an evaluation of metals. However, there is no consideration of LNAPL in sediment in draft TARPS guidance. The presence of LNAPL cannot readily be incorporated into the draft TARPS framework and the risk-based approach underlying this guidance. For such areas (i.e., the lagoons), additional considerations apply to adequately protect human health and the environment. This Path Forward Approach recognizes that the reported free product may represent mobile LNAPL, but not necessarily migrating LNAPL. It includes a discussion of:

- Engineering based alternatives to risk-based draft TARPS approaches;
- Data gaps relating to the feasibility evaluation for such engineering remedies; and
- The data required to evaluate the mobility of LNAPL further.

In addition to the potential presence of LNAPL, two sediment locations near the old discharge point (RSED-09 and RSED-11) have concentrations of lead and possibly benzene

sufficiently elevated to potentially exceed the limits for a characteristic waste. However, a TCLP analysis to determine this has not been conducted on this material, but is included as part of the proposed future sampling for this area. These "worst case" locations are co-located with RSED-09 and RSED-11 near the former discharge point, where LNAPL presence also has been confirmed.

3.1.3 Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediment

Illinois EPA sediment-specific guidance is "Draft Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments" (draft TARPS, Illinois EPA, 2009). The document is draft, currently in its Update 4, dated May 2009. The document is intended for use with sediments impacted by hydrocarbons overseen by the Illinois EPA Office of Emergency Response and/or the Toxicity Assessment Unit (TAU). Use in other contexts may be acceptable when approved by the Illinois EPA. The guidance applies a tiered approach, analogous to the TACO approach, to develop cleanup strategies that result in adequate protection of aquatic species as well as wildlife and human receptors.

Tier 1 entails a comparison of sediment concentrations to conservative, SSV concentrations for BTEX and PAHs. Tier 2 entails a comparison of sediment concentrations against site-specific SSVs calculated from water quality standards and site-specific organic carbon mediated bioavailability, or from alternate sources. These Tier 2 SSVs represent a more realistic measure of ecological risk that considers some, but not all, of the site-specific factors which can modify the toxicity of chemicals to benthic organisms. Tier 3 includes more direct and site-specific demonstrations that a "release," as defined in TARPS, has not adversely impacted sediments, as well as including methods to develop cleanup objectives using other approaches, subject to TAU concurrence prior to implementation.

The draft TARPS guidance provides the framework for the Path Forward Approach for the evaluation of lagoon and pond sediment for COPCs, and it will form the basis for the evaluation, complemented as necessary with Federal or other guidance. Because the guidance remains as draft, the applicability and/or any deviations will be confirmed with Illinois EPA.

It is understood that evaluation under draft TARPS Tier 3 is subject to Illinois EPA approval before final closure can be achieved.

3.2 Applicable Federal and Other Sediment Related Guidance

3.2.1 COPC Screening Criteria

Sediment screening criteria are available from multiple sources. There are no unified, Federal level sediment criteria. Sources of sediment screening levels that may be applicable to the FSA, in addition to the SSVs, outlined in draft TARPS, include:

- U.S.EPA Region 5 Ecological Screening Levels (ESLs; U.S.EPA, 2003). These values are compilations of screening levels from various sources. Values for some chemicals are not necessarily risk-based, and may be, in some cases, based on outdated data. Region 5 is no longer supporting or updating these values. However, they tend to be highly conservative and formed the basis of the Tier 1 values approved for, and used in, the Group 3 SIR[9]

- MacDonald *et al.* (2000) "Consensus" Threshold Effect Concentrations (TEC) and Probable Effect Concentrations (PEC). The TEC is a conservative screening value below which the probability of adverse effect on aquatic biota is less than 10 percent. The PEC is the concentrations above which there is greater than 50 percent probability of an adverse effect. Both criteria are used in concert at higher tiers of evaluation to provide context for sediment concentrations. The TARPS Tier 2 baseline and alternative SSVs, listed in TARPS, include values selected from this source.

- The National Oceanic and Atmospheric Administration (NOAA) Effects Range-Low (ER-L) and Effects Range-Medium (ER-M) (Long and Morgan, 1991). The ER-L and ER-M concentrations are defined similarly as the MacDonald *et al.* "consensus" values, but are derived from marine data and specific to marine sediments. The draft TARPS Tier 2 baseline and alternative SSVs, listed in this guidance, include values selected from this source.

- U.S.EPA proposed Sediment Quality Criteria (SQC). Specific criteria have been developed for a few of the COPCs (acenaphthene, fluoranthene, and phenanthrene). However, these SQCs are seldom applied today and have been supplanted by the equilibrium partitioning criteria detailed in U.S.EPA (2003) and discussed in Section 3.2.2. The TARPS Tier 2 baseline and alternative SSVs,

[9] Illinois EPA's comments on the Group 3 SIR indicated a preference for the draft TARPS Tier 1 values over Region 5 ESLs. The Draft Remediation Approach document re-evaluated the site data against draft TARPS Tier 1 and Tier 2 values where such were available. Draft TARPS Tier 1 values will continue to be preferred going forward.

listed in TARPS, include values selected from this source and are included in the sediment evaluation.

- NOAA Screening Quick Reference Tables (SQuiRT) recommended SSV's (Buchman 2008). This is a compilation of tabulated screening values, and include the NOAA ER-L/ER-M and the MacDonald *et al.* (2000) TEC/PECs, in addition to screening criteria from several other sources.

- Individual State or Provincial sediment criteria. Various states have sediment quality criteria assembled from one or more of the sources described here, or from Canadian or other guidance as well independent research evaluations.

It should be emphasized that for purposes of the present investigation, the exact nature of "Tier 1" screening criteria, and to a lesser extent any "Tier 2" values, is of lesser concern because the intent for the lagoons and ponds is application of Tier 3 approaches to determine remedial needs. The Tier 3 approaches, proposed for ponds and lagoons, represent direct measures of biological and physical integrity that integrate the effect of all COPCs, thereby obviating preliminary screening steps.

3.2.2 Equilibrium Partitioning

U.S.EPA (2003) has developed an approach for derivation of ecological sediment benchmarks applicable to non-polar organics, including PAHs, that defines potential toxicity thresholds based on EqP theory. EqP theory was developed to represent concentrations of chemicals that are freely dissolved in pore water, which is the most realistic exposure pathway for benthic organisms in most cases, including the FSA. For PAHs, EqP also estimates aquatic (pore water) toxicity based on structural activity relationships based on the assumption of a similar mode of toxic action (narcosis) to aquatic organisms from all these compounds. This approach is similar to the approach underlying the Tier 2 values in draft TARPS. This approach has been extended to other non-ionic organic COPCs (U.S.EPA 2012). The EqP screening criteria are site-specific and can be calculated for COPCs without available water quality criteria or toxicity thresholds. This approach underlies the Tier 2 SSVs in the TARPS guidance. In accordance with Illinois EPA recommendations in the communication of March 9, 2018, this Path Forward Approach further contemplates extending the Tier 2 SSV derivation by applying the full U.S.EPA (2003) PAH mixture equilibrium partitioning sediment benchmark approach, which will require calculation of the corresponding additive toxic units derived from data for the extended set of alkylated PAHs ("PAH_{34}"), where applicable.

3.3 Sediment Remedy Guidance

Key guidance documents on sediment remediation include:

- U.S.EPA (1998) EPA's Contaminated Sediment Management Strategy.
- U.S.EPA (2002a) Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites. OSWER Directive 9285.6-08.
- U.S.EPA (2002b) A Guidance Manual to Support the Assessment of Contaminated Sediments in Freshwater Ecosystems.
- U.S.EPA (2005) Contaminated Sediment Remediation Guidance for Hazardous Waste Sites.
- U.S.EPA (2015) Determination of the Biologically Relevant Sampling Depth for Terrestrial and Aquatic Ecological Risk Assessments.
- U.S.EPA (2017a) Remediating Contaminated Sediment Sites - Clarification of Several Key Remedial Investigation/Feasibility Study and Risk Management Recommendations, and Updated Contaminated Sediment Technical Advisory Group Operating Procedures.
- ITRC (2014). Contaminated Sediments Remediation, Remedy Selection for Contaminated Sediments.

Procedures for site and sediment characterization, remedy selection, design, and monitoring of subaqueous caps are detailed in U.S.EPA (2005). Other foundational guidance establishing the viability of, and procedures for, subaqueous capping date back to the 1990s:

- USACE (1998) Guidance for Subaqueous Dredged Material Capping.
- U.S.EPA (1998) Assessment and Remediation of Contaminated Sediments (ARCS) Program. Guidance for In-Situ Subaqueous Capping of Contaminated Sediments.
- USACE (2002) Subaqueous Capping and Natural Recovery: Understanding the Hydrogeologic Setting at Contaminated Sediment Sites.
- USACE (2005) Equipment and Placement Techniques for Subaqueous Capping.
- U.S.EPA (2008) Measuring Contaminant Resuspension Resulting from Sediment Capping.
- U.S.EPA (2013) Use of Amendments for In Situ Remediation at Superfund Sediment Sites.

4. SUMMARY OF EXISTING DATA AND INVESTIGATIONS

4.1 Previous Sediment Sample Collection and Analysis

Previous investigations into pond and lagoon sediments are detailed in the Group 3 SIR (SMA, 2012), and follow-up analysis is presented in the Draft Remediation Approach (SMA, 2017a). Unlike for other areas of the Facility, there are no other formal environmental investigations in the record for the lagoon and pond sediments.

4.1.1 Horizontal and Vertical Extent

The SIWP (SMA, 2010) outlined a sediment sampling program for the lagoons and ponds consisting of 24 sediment boring locations to include sediment and underlying native clay soils for purposes of characterizing extent. This distribution of sample locations was approved by Illinois EPA in January 2011. The results were reported in the Group 3 SIR and further evaluated in the Draft Remediation Approach. Illinois EPA has had no comments related to the extent of sampling, with the specific exceptions outlined below.

Sampling of the sediment was conducted via manual coring. Geoprobe® was used for penetrating the sediment and underlying native clay soil. At locations where less than 6 feet of sediment accumulation were present, a single sediment sample was collected. Where sediment accumulation exceeded 6 feet, two sediment samples were collected: one representing the 0 to 3-foot interval, and one in the 3 feet to the bottom of the sediment layer interval were collected. In addition, the borings were extended into the underlying clay soil and a sample from the native material collected. Samples were selected from the most impacted interval based on visual or photoionization detector (PID) readings. Thus, the sample results represent the "worst case" or highest possible concentration, and not a composite or average concentration across the interval.

The sediment core locations were distributed as follows (see also Figure 6):

- #1 Lagoon – 5 locations. All locations exceeded 6 feet of sediment accumulation, and sediment samples from the 0 to 3 feet, and 3 feet to end of boring intervals were collected.

- #2 Lagoon – 5 locations. All locations exceeded 6 feet of sediment accumulation, and sediment samples from the 0 to3 feet, and 3 feet to end of boring intervals were collected.

- #3 Lagoon – 5 locations. Three borings exceeded 6 feet of sediment accumulation, and sediment samples from the 0 to 3 feet, and 3 feet to end of boring intervals were collected. One core (RSED-11) contained 6.6 feet of sediment and one core with 4.6 feet of sediment (RSED-14), were only sampled across the entire interval.

- Pond #1 – 5 locations. No boring exceeded 6 feet of sediment accumulation, so one sediment sample per core was collected.

- Pond #2 – 2 locations. Neither exceeded 6 feet of sediment, so one sediment sample per core was collected

- Pond #3 – 2 locations. Neither exceeded 6 of feet sediment, so one sediment sample per core was collected

One observation associated with this sampling effort is that the BAZ had not been specifically characterized, as all samples included sediment intervals that exceeded what is typically considered to represent this zone (i.e., generally 0 to 0.5 foot). Thus, the current exposure to surface sediment-dwelling aquatic biota is not characterized. The elevated concentrations and visual impact observations, in most cases, were reported in the deepest sediment strata of those collected, suggesting surface sediment resulting from deposition in recent decades is less impacted than the results may suggest.

Illinois EPA noted (Condition 14 of their June 30, 2015 compliance letter) one data gap in the horizontal coverage of the Group 3 SIR: a former borrow pit area just west of the #1 Lagoon is currently water filled, and connected to this lagoon. No sampling has been conducted in this area to date, but will be included in the proposed evaluation. The approach for this area will follow the evaluation structure for the larger FSA.

4.1.2 Sampling Procedures

The Group 3 SIR reported that manual sampling of the sediment layers was impractical, so the borings were advanced with individually packaged 2-inch diameter clear PVC piep to termination depth, upon which the top was sealed and the pipe retrieved, dewatered by decanting, and extruded to access the sample. The underlying clayey soil was sampled using a Geoprobe®.

Samples were collected at the location(s) of headspace PID hits or visual observation of contamination, and were therefore not composited. As noted, sediment samples were collected in the 0 to 3-foot interval and the 3 feet to end of boring interval for cores longer than 6 feet, while only one sediment sample was collected from cores of less than 6 feet. However, sample RSED-23 was collected over the 0 to 5.2-foot interval when total sediment

depth was 7.9 feet, and RSED-24 was collected over the 0 to 1-foot interval when total sediment depth was 4.6 feet.

Samples were collected for geotechnical analysis at the locations indicated in Table 2. The geotechnical analysis included liquid limit, plastic limit, and plasticity index, in addition to the grain size percent composition, fraction organic carbon, and moisture content.

4.1.3 Analytes and Measurements

In accordance with the Group 3 SIWP, samples were analyzed for VOCs by U.S.EPA 8260B, SVOCs including 1,4-dioxane, quinoline and pyridine by U.S.EPA 8270C, cyanide, metals, pH, percent moisture, and total solids.

Geotechnical analyses included particle size analysis, and organic matter content (converted to estimated organic carbon content using the conversion factor of 0.58). Shake tests for observations of sheening were conducted on 11 selected sediment samples from 9 cores.

A Synthetic Precipitation Leaching Procedure (SPLP) leachate test for cobalt was conducted on samples which exceeded the pH comparison value.

Field observations included sediment classification and observations of apparent impacts (e.g., free product, sheen, and odor). Headspace PID readings were recorded for some, but not all samples.

4.1.4 Tier 1 and Tier 2 Screening Procedures

The Group 3 SIR applied the U.S.EPA Region 5 ESLs for the initial comparison against sediment chemical concentrations, as approved in the Group 3 SIWP. However, based on Conditions 11 and 12 of the June 30, 2015 compliance letter from Illinois EPA, these were replaced where applicable with the suggested Illinois EPA Tier 1 SSVs (also reported for PAHs an BTEX in Table 1 of draft TARPS) or other comparison values (for metals) for revised screening in the Draft Remediation Approach.

Tier 2 screening was not conducted in the Group 3 SIR. However, Tier 2 SSVs were developed for the Draft Remediation Approach in accordance with the guidance in draft TARPS. The preliminary site-specific Tier 2 values were derived using the lowest measured site-specific fraction of organic carbon (f_{oc}= 0.031), and applying the lower of the human health ingestion or chronic aquatic criteria. This screening approach applied to BTEX and most PAHs. For remaining analytes, no Tier 2 values were selected and the evaluation used the Tier 1 values.

No Tier 3 evaluation was conducted in the Draft Remediation Approach, although the document noted the potential need for such evaluations (SMA, 2017).

4.2 Observations of LNAPL and Sheens

"Free product" was reported in three of five locations in #2 Lagoon, and at one location in #1 Lagoon, defining an area outlined on Figure 7, centered around the former discharge point, which was located between the two lagoons. Figure 7 shows two transects along the west and east side of the lagoons, respectively, to illustrate vertical extent of free product and sheens. The location of these transects is shown in Figure 8. The "free product" was reported in deeper sediment and appear to coincide with elevated concentrations of COPCs as well as elevated PID readings. Figure 8 shows the approximate horizontal extent of "free product" based on the Group 3 SIR results.

In addition, direct observations and/or the jar shake tests identified "sheens" generated in samples from #1, #2, and #3 Lagoons. In #1 and #2 Lagoons, the sheens coincide with locations of reported "free product" and/or elevated concentrations of PAHs and BTEX. However, the sheen reports in #3 Lagoon do not appear associated with elevated concentrations of co-located PAHs or BTEX. The Path Forward Approach outlines approaches to confirm the mobility of LNAPL and sheens.

4.3 Reported Analytical Results

The full analytical data set for sediment chemical analysis and physical observations is reported in Attachment 1. The Draft Remediation Approach document (SMA, 2017) presented tables of preliminary Tier 2 (and Tier 1) exceedances.

Table 2. Organic Matter Content of Sediment

Sediment sample	Depth interval (feet)	Organic Matter Content (percent)	Total Organic Carbon (percent) after applying conversion factor of 0.58
RSED-01	3 - 6.2	8.7	5.0
RSED - 02	3 - 6.4	7.1	4.1
RSED - 06	3 - 7	9.6	5.6
RSED - 08	3 - 5.8	7.7	4.5
RSED - 10	0 - 7.1	8.1	4.7
RSED - 11	0 - 6.7	21.2	12.3
RSED - 14	0 - 4.0	9.1	5.3
RSED - 16	0 - 2.5	5.3	3.1
RSED - 18	0 - 3.4	7.4	4.3
RSED - 20	0 - 5.3	9.1	5.3
RSED - 21	0 -1 .25	6.4	3.7
RSED - 24	0 - 1	5.3	3.1

Organic carbon content was evaluated at 12 locations (Table 2). Surface samples from areas un-impacted by hydrocarbons (locations RSED-16 to RSED-24 in the ponds) ranged from

3.1 percent to 5.3 percent. This range is likely to be representative of recent depositional material in the system. The presence of hydrocarbons influence organic carbon content, as may be the case for the elevated value at RSED-11. For the Tier 2 values used in the Draft Remediation Approach document, an organic carbon content was conservatively set at 3.1 percent (f_{oc}=0.031), the lowest level in the data set. Additional analysis will apply updated f_{oc} values from the unaffected locations in the ponds.

4.4 Tier 2 Reevaluation of Reported Results

Tier 2 SSVs were re-calculated and the existing sediment data were rescreened to further define the extent of Tier 1 and Tier 2 exceedances in the lagoons and ponds. Tier 2 SSVs were recalculated as follows:

- Chemicals listed in draft TARPS – Tier 2 values were calculated using the ecological water quality criteria and Koc values listed in draft TARPS Table 2 and the lowest measured f_{oc}=0.031. In general, these were the same as in the Draft Remediation Approach, except that only ecological criteria were used and human health consumption Water Quality Criteria (WQC) were not applied.

- Organic chemicals not listed in TARPS – Tier 2 values were calculated applying the Tier 2 formula in TARPS and the lowest measured f_{oc}=0.031. Koc values were derived from Estimation Program Interface (EPI) Suite (U.S.EPA 2012), which is an EPA database of typical chemical properties. WQC were identified as follows:

    - Illinois EPA aquatic life WQC or Table 2 of TARPS where available.

    - For those PAHs for which no Illinois WQC are listed in TARPS, estimated chronic values were taken from U.S.EPA (2003b).

    - For other organic chemicals, aquatic life screening values were taken from U.S.EPA Region 5 ESLs (which compile values from various sources including the States in the region). Where Region 5 ESLs were unavailable, U.S.EPA Region 3 Screening Values for freshwater were selected (e.g., phenol and pyridine).

- The organic carbon mediated approach in TARPS is not applicable to metals and inorganics. For these analytes, a Tier 2 value was defined as the PEC or equivalent.

The re-calculated Tier 2 SSVs are listed in Table 3[10]. These values were used to re-screen observed Tier 1 exceedances in the lagoons and ponds. The COPC list includes those with detected Tier 1 exceedances as well as non-detects with exceedances due to SSVs lower than the reporting limit.

Table 3. Updated Tier 2 SSVs

COPC with Tier 1 Exceedances	WQC (mg/L)	Source	Koc (L/kg)	Source	Tier 2 SSV @f_{oc}=0.031 (mg/kg)	
Benzene	0.86	Illinois EPA WQC	50	TARPS	**1.3**	(a)
Ethylbenzene	0.014	Illinois EPA EPA WQC	320	TARPS	**0.14**	
Toluene	0.6	Illinois EPA WQC	158	TARPS	**2.9**	
Xylenes	0.36	Illinois EPA WQC	398	TARPS	**4.4**	
Acenaphthene	0.062	Illinois EPA WQC	6300	TARPS	**12.1**	
Acenaphthylene	0.015	Illinois EPA WQC	10000	TARPS	**4.7**	
Anthracene	0.00053	Illinois EPA WQC	25000	TARPS	**0.41**	
Benzo(a)anthracene	0.00223	U.S.EPA	377572	U.S.EPA	**26.1**	(a)
Benzo(g,h,i)perylene	0.000439	U.S.EPA	2494595	U.S.EPA	**33.9**	
Benzo(a)pyrene	0.000957	U.S.EPA	1006932	U.S.EPA	**29.9**	(a)
Benzo(b)fluoranthene)	0.000677	U.S.EPA	1445440	U.S.EPA	**30.3**	(a)
Benzo(k)fluoranthene	0.000642	U.S.EPA	1527566	U.S.EPA	**30.4**	(b)
Chrysene	0.00204	U.S.EPA	413048	U.S.EPA	**26.1**	(b)
Dibenzo(a,h) anthracene	0.000283	U.S.EPA	3971915	U.S.EPA	**34.8**	(a)
Fluoranthene	0.0018	Illinois EPA WQC	74000	TARPS	**4.1**	
Fluorene	0.016	Illinois EPA WQC	13000	TARPS	**6.4**	
Indeno(1,2,3,c,d) pyrene	0.000275	U.S.EPA	4055085	U.S.EPA	**34.6**	(a)
Naphthalene	0.068	Illinois EPA WQC	500	TARPS	**1.1**	
Phenanthrene	0.0037	Illinois EPA WQC	25000	TARPS	**2.9**	
Pyrene	0.0101	U.S.EPA	69024	U.S.EPA	**21.6**	(b)
Carbon disulfide	0.015	R5 ESL (1)	21.7	EPI	**0.01**	
2-Butanone (MEK)	2.2	R5 ESL (2)	4.51	EPI	**0.3**	
1,4-Dioxane	22	R5 ESL (2)	2.63	EPI	**1.8**	
2,4-Dimethylphenol	0.11	R5 ESL (3)	492	EPI	**1.7**	

[10] Note that for the full evaluation, Tier 2 SSVs, based on the implementation of the full U.S.EPA (2003) EqP method, will be used per recommendation by Illinois EPA (March 9, 2018).

COPC with Tier 1 Exceedances	WQC (mg/L)	Source	Koc (L/kg)	Source	Tier 2 SSV @f_{oc}=0.031 (mg/kg)	
2,4-Dinitrophenol	0.019	R5 ESL (2)	461	EPI	**0.3**	
4-Nitrophenol	0.06	R5 ESL (2)	291	EPI	**0.5**	
Diethyl phthalate	0.11	R5 ESL (2)	105	EPI	**0.4**	
Di (n) butyl phthalate	0.0097	R5 ESL (2)	1160	EPI	**0.4**	
p-Cresol	0.025	R5 ESL (2)	300	EPI	**0.2**	
Phenol	0.18	R5 ESL (4)	41	EPI	**0.2**	
Pyridine	2.38	R5 ESL (3)	72	EPI	**5.3**	
Arsenic	--		--		**33**	PEC
Cadmium	--		--		**4.98**	PEC
Chromium	--		--		**111**	PEC
Cobalt	--		--		**50**	LEL
Lead	--		--		**128**	PEC
Mercury	--		--		**1.1**	PEC
Nickel	--		--		**48.6**	PEC
Silver	--		--		**4.5**	UET
Zinc	--		--		**459**	PEC

Notes:
f_{oc}=fraction organic carbon – applied lowest observed value of organic matter (0.053) corrected to 0.031
Illinois EPA WQC = Illinois Water Quality Value, Table 2 of TARPS, aquatic life value
U.S.EPA = U.S.EPA Chronic Value based on narcosis model and Koc from U.S.EPA (2003b)
TARPS = K_{oc} value as listed in Table 2 of TARPS
EPI Suite = K_{oc} value from U.S. EPA EPI Suite
R5 ESL = U.S.EPA Region 5 Ecological Screening Value (U.S.EPA, 2003a) for water, where (1) Ohio Water quality value, (2) Michigan Rule 57 Final Chronic Value; (3) U.S.EPA Region 5 Interim Value; (4) Indiana Tier II value
R3 SV – U.S.EPA Region 3 Screening Values for Freshwater (U.S.EPA, 2006).
PEC= NOAA SQuiRT (Buchman, 2014), from MacDonald et al. (2000) "consensus" Probable Effect Concentrations
LEL = NOAA SQuiRT (Buchman, 2014), from Ontario sediment quality Lowest Effect Values (Persaud 1993)
UET= NOAA SquiRT (Buchman, 2014), from Dutch sediment Environmental Risk Limits Upper Effect Threshold at 1% TOC
(a) Updated Tier 2 SSV is higher than the Tier 2 value applied in the Draft Remediation Approach (SMA, 2017) document. This is due to the focus on aquatic life whereby human consumption levels are not considered.
(b) Updated Tier 2 SSV is lower than the Tier 2 value applied in the Draft Remediation Approach (SMA, 2017) document. This is due to the focus on aquatic life whereby human consumption levels are not considered

Table 4 summarizes the Tier 2 SSV re-evaluation for the existing data. Figure 9 shows the distribution of exceedances, focused on detected exceedances only. Attachment 1 presents the complete data tables for sediment COPC content.

Table 4. Preliminary Sediment Evaluation Summary

Sample Location	Surficial Sample						Deep sample					
	Depth interval (ft.)	Phy-sical	Tier 2 SSV Exceedances (detected)				Depth interval (ft.)	Phy-sical	Tier 2 SSV Exceedances (detected)			
			BTEX	PAHs	Metals	Other			BTEX	PAHs	Metals	Other
# 3 Lagoon												
RSED-01	0-3	SH	--	--	--	CS2	3-6.2	SH	--	ANT	Cr	--
RSED-02	0-3	--	--	ANT	--	CS2	3-6.4	SH	--	--	--	--
RSED-03	0-3	SH	--	--	--	CS2	3-8	--	--	--	--	--
RSED-04	0-3	--	--	--	--	CS2	3-6	SH	--	--	--	--
RSED-05	0-3	SH	--	ANT,PHE	--	CS2	3-6.4	--	--	--	--	--
#2 Lagoon												
RSED-06	0-3	SH	--	--	--	--	3-7	SH,FP	E,X	ANT,FLE, NAP,PHE	Pb	--
RSED-07	0-3	SH	--	--	--	DEP	3-6.9	SH,FP	E,X	ANT	--	--
RSED-08	0-5.8	SH	E,X	ANT, PHE		--	Single sample to full sediment depth					
RSED-09	0-3	SH	E	--	--	--	3-8.9	SH,FP	E,T,X	ACE, ANT, CHR, FLE, FLA, PYR, NAP, PHE, PYR	Pb, Hg	. CS2, DMP DBP
RSED-10	0-3	--	--	--	--	CS2	3-7.1	SH	--	--	--	--
#1 Lagoon												
RSED-11	0-6.7	FP	E,X	ACE,ANT, FLA,FLE, NAP, PHE, PYR	Pb, Hg, Zn	DMP	Single sample to full sediment depth					
RSED-12	0-3	--	--	PHE, ANT	--	NP	3-4.9	--	--	ANT,PHE, FLE	--	--
RSED-13	0-3	--	--	--	Cr	--	3-6.5	--	B,E.X	ACE, ANT, PHE, FLE, NAP, PYR	Pb, Zn	CS2

Sample Location	Surficial Sample						Deep sample					
	Depth interval (ft.)	Phy-sical	Tier 2 SSV Exceedances (detected)				Depth interval (ft.)	Phy-sical	Tier 2 SSV Exceedances (detected)			
			BTEX	PAHs	Metals	Other			BTEX	PAHs	Metals	Other
RSED-14	0-4.6	--	--	FLE, NAP, PHE,ANT, PYR	--	--	Single sample to full sediment depth					
RSED-15	0-4.4	--	B,T,E, X	ACE, ANT CHR, FLA, FLE, NAP, PHE, PYR	Cr, Zn	CS2, DMP	Single sample to full sediment depth					
Pond #3												
RSED-16	0-2.9	--	--	--	--	--	Single sample to full sediment depth					
RSED-17	0-3.5	--	--	--	Co	--	Single sample to full sediment depth					
RSED-18	0-3.4	--	--	--	--	CS2	Single sample to full sediment depth					
RSED-19	0-3.7	--	--	--	--	CS2	Single sample to full sediment depth					
RSED-20	0-5.3	--	--	--	--	CS2	Single sample to full sediment depth					
Pond #2												
RSED-21	0-1.3	--	--	--	--	CS2	Single sample to full sediment depth					
RSED-22	0-3.1	--	--	--	--	CS2	Single sample to full sediment depth					
Pond #1												
RSED-23	0-5.2	--	--	--	--	CS2	Single sample to 5.2 feet (total sediment depth 7.9 feet)					
RSED-24	0-1	--	--	--	--	CS2	Single sample to 1 foot (total sediment depth 4.6 feet)					

Notes:
Based on observational and chemical data reported in Table 4.1 of the Group 3 SIR
BTEX: B=Benzene, T=Toluene, E=Ethylbenzene, X=Xylenes
PAHs: ACE=Acenaphthene, ANT=Anthracene, FLA=Fluoranthene, FLE=Fluorene, NAP=Naphthalene, PHE=Phenanthrene, PYR=Pyrene
Physical: SH = Sheens; FP= Free Product
Metals: Pb=Lead, Hg=Mercury, Cr=Chromium, Zn=Zinc, Co=Cobalt
Other: CS2=Carbon disulfide, DMP=2,4-Dimethyl phenol; DBP=Di-n-butyl phthalate, NP=4-Nitrophenol

Examination of Table 4 suggests the following conclusions:

- The pond sediments show little or no hydrocarbon derived contamination. No exceedances of Tier 2 SSVs were observed in Ponds #1 and #2, except for carbon disulfide[11] and therefore will be considered for a Tier 3 demonstration of minimal risk under draft TARPS risk-based closure.

- Pond #3 contained exceedances of carbon disulfide and one exceedance for cobalt, the source of which is uncertain. Because Tier 2 exceedances are present, Pond #3 will be considered for a Tier 3 demonstration of minimal risk under draft TARPS risk-based closure.

- The #3 Lagoon has 10 samples at 5 boring locations collected from both the surficial layers (0 to 3 feet) and from deeper sediment. Sheening but no free product was reported in the top 3 feet (at 2 locations) as well as deeper (3 locations) at most locations, and hydrocarbon-related COPCs (PAHs) are detectable in most samples, but exceedances of Tier 2 SSV are limited to anthracene and phenanthrene (at depth at RSED-01 and in the top 3 feet at RSED-02 and -05). The only other Tier 2 SSV exceedances were for carbon disulfide and a single exceedance of chromium in deeper sediment. The discharges have had less impact on the #3 Lagoon than in #1 and #2 Lagoons. However, it will be considered as part of the same interconnected system as the other lagoons for remedy purposes.

- The #1 and #2 Lagoons have sediment with exceedances of multiple Tier 2 SSVs at all locations. However, the data suggest that the highest concentrations are present in the deeper sediment, especially near the former discharge point located between the #1 and #2 Lagoons, and that cleaner sediment overlies heavily impacted material. Those samples, targeting only the top 3 feet, lack hydrocarbon-related Tier 2 SSV exceedances, except for RSED-09 in the #2 Lagoon, where ethylbenzene is present. Some of the samples (RSED-08, -11, -14, and -15) reflect samples from the entire sediment column, and the samples therefore are not necessarily representative of shallow conditions, judging from the distribution of contamination in the boring logs. Sheens, however, were reported in several of the 0 to 3-foot sediment samples. The shallow samples, with residual LNAPL, and/or PAH, BTEX, or inorganic Tier 2 SSV exceedances, all include portions from below 3 feet; and are similar to the conditions

[11] Carbon disulfide has a very low Tier 2 SSV due to its low affinity for sediment. It also has a short half-life in aquatic media. It is frequently seen in sediment sampling as it is generated biogenically. It is estimated that 40 to 80 percent of carbon disulfide is naturally occurring (EC 1999, WHO 2005) and is produced especially in marshes (Adams *et al.* 2012). That carbon disulfide can be found also in ponds not suspected of containing release related COPC suggests a separate source. Therefore, unless the concentrations are very high (as they indeed are at a couple of the locations with high COPC concentrations near the discharge points) it is likely that the reported carbon disulfide is biogenic. However, it has been identified as a COPC and will be evaluated via the risk-based TARPS approach.

observed in the deeper only samples, where exceedances of Tier 2 SSVs are present. However, there are insufficient data to determine if there is unacceptable risk to aquatic biota exposed to the BAZ sediment. The evidence suggests the risk in surface sediment and the BAZ may in fact be minimal. This is a potential data gap addressed by additional sediment sampling in this document.

- There are high concentrations of BTEX, lead, and PAHs present in some of the deep samples in the #1 and #2 Lagoons, especially near the former discharge point. As noted previously, lead and possibly benzene at two locations may be present at levels exceeding the TCLP limits for a characteristic hazardous waste. These elevated concentrations are located nearest the former discharge point. This Path Forward Approach includes evaluation of these COPCs if they exceed the criteria for a characteristic waste. Only one location (RSED-10) lacks clearly hydrocarbon-related exceedances. The concentrations of COPC in the #1 and #2 Lagoons would likely result in adverse effects to aquatic biota if exposure were to occur. Due to the presence of LNAPL and potentially characteristic lead and benzene, these areas do not fall under the risk-based approach, and all three lagoons need be considered for capping, and potentially additional engineering remedies if the LNAPL is migrating and/or the chemicals in the sediment exceed the TCLP criteria for a characteristic waste.

4.5 Identification of Data Gaps

Review of the Group 3 SIR (SMA, 2012), the Draft Remediation Approach document (SMA, 2017), associated Illinois EPA correspondence, and the re-evaluation of data presented here, we propose the following path forward to address risk-based concerns about sediment within the framework of TACO, TARPS, and the draft Consent Order for areas where risk-based approaches are appropriate. Coordination with Illinois EPA and TAU will help define and scope out response to any data gaps, Tier 3 needs, and remediation options.

We have identified the following data gaps that need to be addressed for the former Borrow Pit, ponds, and lagoons in order to evaluate remediation options and/or closure.

4.5.1 Data Gaps: Former Borrow Pit

The former Borrow Pit has not been investigated for nature and extent of contamination, if any. Figure 10 presents a summary of data gaps to complete the sediment evaluation in accordance to applicable guidance and preferred Tier 3 alternatives.

- Obtaining characterization and toxicity samples from the former Borrow Pit, west of the #1 Lagoon, to determine if this area may need further investigation and/or closure.

4.5.2 Data Gaps: Ponds

The proposed remedy for the ponds is closure in accordance to TARPS Tier 3 criteria. This process includes:

- Obtaining additional sediment data in the BAZ of the ponds (and reference locations) to further define potential current risk to aquatic life by comparison to Tier 2 SSVs, developed in accordance with TARPS and U.S.EPA (2003), and to provide context for the collection and evaluation of toxicity and benthic community metrics data.

- Conducting sediment toxicity testing in all the ponds, plus at reference location(s)[12]. This toxicity testing is to provide support for a Tier 3 demonstration of minimal risk in Ponds #1, #2, and #3.

- Conducting a biological community integrity evaluation of the aquatic and benthic community in all three ponds, compared to a properly defined and identified reference location(s). The biological community integrity evaluation provides support for a Tier 3 demonstration of minimal risk.

4.5.3 Data Gaps: Lagoons

Decisions about selection and feasibility of remedy selection for the Lagoons is influenced by the presence of LNAPL, the potential presence of material that may exceed the limits for characteristic waste, and the former use of the lagoons as receiving waters for Facility discharges. LNAPL and characteristic waste are not addressed in TARPS and therefore are not subject to a risk based closure. The Group 3 SIR reported "free product" at various locations in the #1 and #2 Lagoons and sheening at various locations in all three lagoons.

Based on the data collected in the Group 3 SIR (presence/absence of LNAPL), type of LNAPL (i.e., residual [immobile], mobile, or migrating) cannot be determined. It is assumed that previous observations of "free product" represent immobile or mobile LNAPL that is not migrating LNAPL. Additional testing will be utilized to characterize LNAPL at locations near the former discharge points, observed, i.e. in the area of RSED-09 and RSED-11, in order to understand if the local conditions are such that the LNAPL may undergo migration

[12]TARPS identifies comparison of the biological community integrity of a site against an unaffected "reference site" as a benchmark to determine whether acceptable risk, as described in TARPS, can be demonstrated. The comparison to reference areas is necessary to evaluate biological conditions, as there is no generally accepted objective scale for biological community integrity for many aquatic habitats. Because standardized scales are unavailable for the kind of waterbody in the present study, defining and identifying a comparable and unaffected reference site will be necessary to compare biological community integrity indices. Reference areas also are needed when evaluating aquatic and sediment toxicity, as other factors (e.g., sediment characteristics, ammonia, etc.) that are not directly site related may also influence toxicity. Identification of suitable reference area(s) and locations is detailed in the Sediment Work Plan, and will be discussed with Illinois EPA.

beyond the existing LNAPL body footprint under conditions reasonably foreseen at the Facility.

The process of characterizing LNAPL includes:

- Obtaining sediment cores near the two "worst case" locations with reported sheening and/or free product (RSED-09 and RSED-11) located nearest the former discharge point. Cores will initially be assessed visually for the presence of LNAPL. If LNAPL is identified, second adjacent cores for the LNAPL laboratory assessment will be collected and frozen in the field using dry ice and submitted for laboratory analysis.

- Step-out borings will be conducted around these presumed "worst case" locations to determine the extent of migrating LNAPL, if present, consistent with the presumed distribution of LNAPL in Figure 8. Cores from borings at step-out locations will be evaluated for evidence of LNAPL (visible LNAPL) and in the event of positive observations, additional adjacent cores will be collected and frozen in the field using dry ice and submitted to the laboratory for storage and potential further laboratory analysis.

- Laboratory and hydrogeologic analysis to characterize LNAPL as residual (immobile), mobile, or migrating follows the outline presented in Figure 11 and is summarized below:

    - White light and UV-light photography (API RP40/Proprietary) to aid in visualizing LNAPL presence/absence, location and saturation variability. If no evidence of LNAPL is observed in UV photographs then it will be considered not present or residual (immobile) and no further laboratory testing is needed. If LNAPL is observed in UV photographs, then further testing via water drive is needed, and the UV photographs will guide selection of the core samples to be tested.

    - LNAPL mobility via water drive (API RP40/proprietary) where LNAPL is observed within the interval(s) with positive UV-light photography. The water drive method will allow the determination of LNAPL mobility, or lack of such mobility, under a hydraulic gradient significantly greater than a native one. If no LNAPL is produced from the sample during the water drive test, then the LNAPL is characterized as residual (immobile) and no further evaluation is needed. If visual observations of LNAPL or sheen are observed in the fluid collected during the water drive test, then the sample will be further tested by pore fluid saturation analysis.

- Pore fluid saturation (API RP40 and Dean Stark extraction) testing will serve to evaluate the percent of pore space that contains LNAPL and facilitate the assessment of LNAPL distribution and saturation level. Pore fluid saturation data derived from the addition of any water drive derived LNAPL production and any LNAPL pore fluid saturation values will be reviewed and compared with published ranges of LNAPL residual (immobile) saturation levels for similar materials based on capillary parameters and other physical properties. If pore fluid saturation testing indicates that LNAPL is present at levels greater than residual, then further mobility testing using flexible wall permeameter methods is proposed.

- LNAPL mobility via flexible wall permeameter analysis (ASTM D 5084). Flexible wall permeameter testing will allow the application of hydraulic forces that are more similar to native conditions than were applied during water drive analysis. If LNAPL is observed in fluid produced from the sample during this test, then the LNAPL is characterized as mobile with potential to migrate. If no LNAPL is observed during this test, then the LNAPL is characterized as mobile and not migrating, and no further testing is required.

If laboratory testing indicates that LNAPL is mobile with potential to migrate, then a site specific hydrogeologic analysis will be performed to determine if LNAPL could migrate beyond the existing extent under conditions reasonably foreseen in the FSA. If LNAPL is present in sufficient quantity to allow collection for analysis, fluid properties of LNAPL will be tested including dynamic viscosity, fluid density, and surface and interfacial tensions. Information about hydraulic and hydrogeologic conditions will be derived from vibrating wire piezometer data, grain size analysis, core logging, and visual observations, which will be used to determine if a sufficient gradient is present through the native materials to allow LNAPL to migrate.

If a sufficient gradient is not present, then the LNAPL is mobile not migrating. If a sufficient gradient to drive LNAPL migration through the native material is present, then the LNAPL is considered locally migrating. Locally migrating LNAPL has the potential to migrate within the existing extent while the overall LNAPL body would remain stable. In other words, locally migrating LNAPL would not have the potential to migrate into surrounding sediment resulting in an expansion of the existing footprint (vertically or laterally). If locally migrating LNAPL is determined to be present at the "worst case" locations (RSED-09 and/or RSED-11), then the archived frozen step-out cores will be evaluated to determine if migration could occur beyond the existing extent and result in potential expansion of the LNAPL footprint and be considered migrating LNAPL.

Note that any of the laboratory methods referenced above may be substituted with similar alternative method(s), if needed, with a prior concurrence with Illinois EPA.

4.5.4 Data Gaps: Containment and Isolation

The initial sampling for the sediments within the lagoons and ponds included limited geotechnical data. The sediments are predominantly fine silts and clay with moderate to high moisture contents, indicative of deposited river sediments. These observations were uniform across both lagoons and ponds, suggesting uniform deposition and limited other sediment sources other than flooding. To address data gaps about the geophysical characteristics of the lagoons, and to permit evaluation of the feasibility and scope of proposed capping, the following process is proposed:

- Determining sediment surface condition and debris accumulation in the lagoons by bathymetric survey and side-scan sonar survey. These will quantify water depth, sediment surface, and evidence of any subaqueous structures that could impact remedial scope.

- Evaluating in-situ undrained shear strength of the sediments across the lagoons and vertically, with depth, down to the native clay soil interface using vane shear testing. Vane shear testing from small boats and/or from a barge will be performed on a suitably scaled grid pattern across the site. The evaluation will include lagoon side slopes.

- Conducting sediment coring, at undisturbed locations, to complete geotechnical assessment of the sediments. Sampling will be conducted across the full depth of the sediment and into the subsoil for documentation of the A Clay. Samples will be collected from three to five locations per lagoon across the lagoon bottoms and one to two locations per side slope.

- Geotechnical assessment testing will include moisture content, percent solids, grain size analysis, Atterberg limits, and soil classification. A limited number of geotechnical tests will also be completed to characterize the shear strength, hydraulic conductivity, and consolidation properties of the sediments.

- Pore water samples, from discrete vertical locations within the sediment, will be taken and submitted for testing of the COPCs. This analysis will also address the need for amendments to the capping materials. The pore water will be obtained from undisturbed sediment samples. The specified portion of the sample will be placed in a container in the field and the drainage water (pore water) will be collected. The samples will be preserved and submitted for testing after filtration.

- Laboratory bench testing will be conducted to evaluate the consolidation potential of the sediment. Sediment from the upper 2 to 4 feet will be collected. Application of load, using sand, will be performed in the sample tubes to observe the sediment/sand mixing zone and estimate initial consolidation of the surficial sediments. Any extruded pore water may be submitted for testing of COPCs if the volume is sufficient. This analysis will also address the need for amendments to the capping materials.

- Five to seven borings will be completed on the perimeter of the lagoons to define bank material properties and evaluate stability under loads. The locations will be selected based on proposed access to the lagoons, for capping equipment, and material delivery. These borings will be coordinated with any site groundwater well drilling, to make efficient use of the drilling equipment. The soils will be sent to the geotechnical laboratory for geotechnical assessment.

- Surface (0 – 0.5 foot) shoreline samples collected to document physical soil properties and potential COPC conditions at the perimeter of the lagoons.

- Vibrating wire piezometers will be installed in the center of #2 Lagoon, and on the west and east sides, respectively. They will be used to evaluate groundwater gradients to determine lateral and vertical containment and to support the evaluation of whether potentially migrating LNAPL is migrating as described in Section 6.3.1. The piezometers will be operational for 6 months to provide adequate hydraulic data.

5. EXCLUSION OF HUMAN HEALTH EXPOSURES

The River Dock Area is private property; "No Trespassing" signage is posted and the premises are under 24-hour guard. However, there are few physical barriers to trespassing at the ponds and lagoons. There have been indications of trespassing in the wooded areas of the River Dock Area. Observations of access from the land side (i.e., from the top of the levee) have not been reported, but are physically possible. A large part of the River Dock Area is a secure facility and trespassers, if found are quickly expelled. Some trespassing in other, non-secured portions of the River Dock Area is possible but may be considered as insignificant as frequency and duration of trespassing would be low before being identified and expelled. Exposure to site media would be commensurately minimal.

While some fish are likely present in the ponds and lagoons via immigration during flood events, the waterbodies would be highly unlikely to support a resident population of catchable, edible-size fish due to their stagnant nature during non-flood stages. There is little attraction for trespassing fishermen to access these water bodies.

The available data, discussed in Section 4, indicates that most of the COPCs exceeding the Tier 2 SSVs are present in deeper sediment, and that little contamination is present in the top 3 feet of sediment, so in the event of occasional contact with sediment by workers or trespassers, the magnitude of exposure to COPCs would be minimal.

As noted in previous sections, the COPCs are typically isolated in deep sediment and there appears to be limited upwards migration via advection or diffusion towards the surface sediment and overlying water column. Downwards migration appears to be minimal as the A Clay, underlies and surrounds the lagoons, functioning as barriers to migration of contaminated materials and groundwater. This absence of migration pathways out of the lagoons also suggest no impact to the Mississippi River.

Per 35 IAC 742.200 a "Human Exposure Pathway" means a physical condition which may allow for a risk to human health based on the presence of all the following: contaminants of concern; an exposure route; and a receptor activity at the point of exposure that could result in contaminant of concern intake. The COPCs are present primarily in deep sediment with no evidence of an active exposure route and human activity at the lagoons is minimal. Therefore, it is reasonable to conclude that human exposure to affected deep sediment is an incomplete exposure pathway, either directly or via fish ingestion.

Premcor will review potential additional access controls to minimize site access by trespassers to ensure that human exposure remain insignificant under current and post-remedy conditions.

If further site evaluation indicates the need to implement measures to further protect human health, this will be considered during decisions about remedies (Section 6) and/or institutional controls (Section 7).

6. APPROACH TO ADDRESS EXCEEDANCES

6.1 Development and Implementation of Work Plan

The draft TARPS guidance document emphasizes concurrence from TAU before proceeding with any Tier 3 evaluations. In association with ongoing communications with TAU and Illinois EPA, a Work Plan will be submitted as a Pre-Approval Report detailing the proposed data collection and interpretation criteria. This Work Plan is expected to be submitted following concurrence on the Path Forward Approach.

The Work Plan will define the scope for the following tasks to achieve the objectives outlines in this Path Forward Approach document:

Former Borrow Pit

- An investigation of nature and extent of COPCs via sediment borings to native material. The extent of depositional sediment in this borrow pit is currently not known, and the water body is shallow. Two borings will be advanced across the 1.4 acres.

- Analysis of surface sediment toxicity, in the event that sediment COPC concentrations exceed TARPS SSVs.

Ponds and Reference Area(s)

- Collection of surface sediment from representative locations in each of the three ponds and the reference location(s) to improve sediment COPC characterization. Samples will be analyzed for the complete analyte list, in addition to evaluating the extended PAH_{34} list to allow more accurate equilibrium partitioning calculations.

- Collection of co-located sediment for sediment toxicity testing in ponds and reference location(s) as part of the Tier 3 TARPS evaluation, and presentation of sediment toxicity methods and interpretation criteria

- Collection of benthic biota to evaluate the "biological integrity" of the ponds and reference location(s) in accordance with Tier 3 TARPS evaluation, and presentation of metrics and interpretation criteria.

- Definition of the process and approach for identifying reference sites.

Lagoons

- Collection of sediment samples from RSED-09 and RSED-11 and nearby step-out locations to be evaluated for potentially migrating LNAPL and presence of materials exceeding the limits of characteristic wastes.

- Collection of geotechnical samples from the lagoons to evaluate engineered isolation and containment (subaqueous capping) alternatives., including sediment borings, consolidation pore water evaluation, and vane shear testing.

- Collection of geotechnical samples from the lagoon perimeters, and collection of shoreline sediment samples to evaluate the integrity of the lagoon containment.

- Installation of temporary vibrating wire piezometers to evaluate vertical and horizontal hydraulic gradients as part of the lagoon containment integrity evaluation and the determination of migration potential of LNAPL.

- Presentation of proposed approach towards evaluating sediment stability and feasibility of engineered remedies

- The detailed sampling sequencing and schedule. In general, the sediment samples should be collected before the biological community evaluations. The community evaluations are further restricted to the growing season (May to October).

- Presentation of the decision process for risk-based evaluation and remedy selection summarized in the following sections.

6.2 Approach to Tier 3 Risk-Based Evaluation

6.2.1 Screening Against Updated Tier 1 SSV Criteria

All chemistry data, including supplemental data, will be rescreened against the updated Tier 1 SSVs. The updated Tier 1 SSVs will be those proposed in Section 4.1.4. Mapping of the exceedances will indicate which areas exceed Tier 1. Areas exceeding Tier 1 will be evaluated against the updated Tier 2 SSV criteria.

In accordance with the draft TARPS guidance, areas exceeding Tier 1, but not Tier 2 criteria, do not require Tier 3 evaluation, but do ultimately require a demonstration of lack of toxicity to determine risk. Development of cleanup objectives would not be necessary in such an eventuality. Such areas will, therefore, also be included in the Tier 3 biological community integrity evaluation.

6.2.2 Screening Against Updated Tier 2 SSV Criteria

Tier 2 SSVs will be updated based on calculations using measured TOC concentrations (for organics subject to equilibrium partitioning) and applying PEC-based SSVs for metals. The TOC value for normalization, analogous to the approach in the Draft Remediation Approach, will be the value for similar sediment in an unimpacted area of the FSA, such as Pond #1, to avoid skewing due to any hydrocarbon related materials.

The TARPS Tier 2 SSV approach will be revised. Tier 2 SSVs will be recalculated using the EqP procedures in U.S.EPA (2003) for all organics. For PAHs this will require appropriate PAH_{34} data to derive a site-specific adjustment factor from PAH_{16} data.

All sediment sample results exceeding Tier 1 criteria, surficial as well as deep sediment, will be screened against Tier 2 SSVs, although it should be recognized that only surficial sediment is a current exposure pathway to ecological receptors.

6.2.3 Selection of Tier 3 Options

Review of existing sediment data in the Group 3 SIR (SMA, 2012) and the "*Draft Remediation Approach"* (SMA, 2017) and refined in Section 4.3, indicate that after incorporating the supplemental Tier 2 data proposed under Section 6.1, exceedances of Tier 1 and Tier 2 SSVs is present in the ponds. The conditions in the Borrow Pit remain unknown..

The TARPS options for Tier 3 evaluation were outlined in Section 3.1.2. Table 5 summarizes the current preferred approach to Tier 3, based on available sediment data and building upon the observations in the Group 3 SIR (SMA, 2012) and the "*Draft Remediation Approach*" (SMA, 2017), and ongoing discussions between Premcor and Illinois EPA and/or TAU.

Table 5. Tier 3 Options presented in TARPS

Option	Applicability to Site	Preferred Options
Conduct a site-specific human and ecological risk assessment, per U.S.EPA guidance, and use as basis for developing Cleanup Objectives (COs).	Applicable. However, the data suggest biological demonstrations are the most efficient demonstration of minimal risk.	Not preferred
Conduct analysis of anticipated cost-benefits of remediation.	Applicable. The scope of the remediation needs and areas subject to cleanup objectives remain undefined, and it is premature to assume this case.	Potential future consideration
Demonstrate if remediation is impractical, infeasible, or not cost-	Applicable. The scope of the remediation needs and areas subject to COs (i.e., failing Tier 3) remain	Potential option to be evaluated for areas

Option	Applicability to Site	Preferred Options
efficient, and propose *in-lieu* habitat replacement.	undefined. Based on site-specific information, remediation of deeply buried sediment may meet this standard.	failing Tier 3 minimal risk demonstration
Develop background data set to define COs.	Not applicable. Sediment concentrations for many COPCs are expected to exceed background.	Not preferred
Demonstrate minimal risk to aquatic receptors by toxicity tests and biological integrity evaluation or other method. Development of sediment COs may not be necessary.	Applicable. This method applies to sites where human health or animal exposure is unlikely, which is the expected case. The focus of this Path Forward Approach is defining data needs in support of this approach.	Preferred option. Evaluation of existing sediment data suggests this may be demonstrated across most, if not all, the affected areas
Propose alternative water toxicity benchmarks and alternative sediment COs.	Applicable. Revised Tier 2 SSVs incorporate data from alternative sources where no Illinois EPA guidance exists.	Not preferred for Tier 3
Propose alternative to the TARPS Tier 2 SSV approach.	Applicable. However, there is currently no reason to modify the approach.	Not preferred

6.2.4 Biological Community Integrity Evaluation

6.2.4.1 Selection of Reference Sites

Selection of reference sites to be applied when evaluating sediment biological community integrity (as well as sediment toxicity) is a critical item of the proposed Tier 3 evaluation. The selection of the reference area or areas will be conducted collaboratively with Illinois EPA, based on the principle that the reference area should be as similar as possible in scale and function to the FSA, except for the source of COPCs. The reference area characteristics to be matched against the FSA are:

- Location in the active floodplain of the Mississippi River, subject to frequent inundation at approximately the same recurrence as for the ponds and lagoons. The waterbodies should, therefore, not be protected by levees.
- Limited ongoing hydrological connectivity (other than flood inundation) to the river and lack of stream inflows. The lagoons and ponds lack surface connection to the river (although underground conveyances may be present in some cases). Therefore, ponds or lagoons are preferred to backwater or side channels that are continuously connected to river flow.

- Artificial origin. The ponds and lagoons have their origin as borrow pits from the construction of the river levees.

- No history of use as receiving water for heavy industry discharges. However, some anthropogenic influence is to be expected as the area is heavily urbanized and industrialized.

- Reasonable proximity to the FSA. Downstream as well as upstream locations are possible.

Preliminary review of mapping for nearby segments of the Mississippi River suggests the existence of several candidate water bodies (e.g., Chouteau Island, Alton Slough, Skinney Island, or Spatterdock Lake) that may fit most of the criteria, although it is likely no one pond will fit all criteria. Final reference pond selection will be made following a site visit, access agreements and and Illinois EPA concurrence.

6.2.4.2 Toxicity Testing Procedures

A demonstration of minimal risk to aquatic receptors will include site-specific sediment toxicity tests. The site-specific sediment toxicity tests will be applicable both to demonstrating minimal risk in areas where Tier 2 SSV exceedances are present, and to confirm minimal risk in areas where Tier 1, but not Tier 2, SSV exceedances are present. It is anticipated that Pond #3 will have Tier 2 SSV exceedances, while Ponds #1 and #2 only exhibit Tier 1 exceedances (except for carbons disulfide, which may be naturally occurring). The conditions in the former Borrow Pit are unknown, but will be tested in case exceedances are found.

The appropriate species and analytical methods will be defined in collaboration with Illinois EPA, but are anticipated to include two species (typically *Hyalella azteca*, an amphipod, and *Chironomus tentans*, a midge larva). U.S.EPA test methods (U.S.EPA, 2000) or similar will be proposed. Toxicity test endpoints will include survival and growth.

Results will be compared against control tests using laboratory controls as well as against the results from sediments collected at a reference site. A sediment will be considered unacceptably toxic (i.e., demonstrates risk) if it exhibits significantly reduced survival and/or growth relative to both controls and reference sediments. The criterion for "significant" will be established prior to the testing. If no significant toxicity is noted relative to controls and reference sediments, acceptable risk to aquatic biota is considered demonstrated for purposes of the evaluation.

6.2.4.3 Biological Community Integrity Evaluation Procedures and Metrics

The Tier 3 demonstration of minimal risk to aquatic receptors for areas exceeding Tier 2 SSV criteria will also include a comparison of the biological community integrity (i.e., benthic community structure) of the area to an unaffected reference site or sites.

Biological community integrity entails the characterization of the aquatic and/or benthic invertebrate community by selected representative population and community metrics, calculating appropriate biological indices appropriate for the type of site, and comparison of these results to the reference site(s). While many State agencies and the U.S.EPA (e.g., Barbour *et al.* 1999) have standardized approaches to evaluating biological community integrity, such standard methods are most often focused on streams and are of limited utility for this semi-stagnant lagoon site. Therefore, it is anticipated that the metrics and indices will need to be defined specifically for the FSA, and the identification of and comparison to a suitable reference becomes of critical importance.

The evaluation of the benthic community has seasonal restrictions. Benthic organisms are generally not active during winter, and therefore sampling needs to consider the active growing season (approximately May to October). There may also be State mandated "index periods" for sampling to standardize results. The sampling needs to be approximately concurrent at the FSA and the reference area. The appropriate time of year for the sampling will be discussed with TAU, and may require consideration of any State mandated index periods.

The metrics to be evaluated include metrics defined at the FSA, and comparative metrics explicitly comparing the site to the reference area. There are many available metrics, and the appropriate metrics for this evaluation will be defined in the Work Plan. Metrics might include, but are not limited to:

- Measures of taxa richness (i.e., number of taxa identified);
- Measures of abundance and biomass within taxa;
- Richness, abundance, and ratios of selected pollution tolerant and intolerant taxa;
- Measures of dominant taxa;
- Diversity indices (e.g., Hilsenhoff index); and
- Similarity Indices between reference area and FSA (e.g., Jaccard index).

The appropriate metrics for the FSA will be discussed with Illinois EPA and defined in the Work Plan.

6.3 Lagoons: Approach to Migrating LNAPL

Data collected to characterize LNAPL in sediment from the "worst case" area near the former discharge point (i.e., RSED-09 and RSED-11) will be used to determine if LNAPL has the potential to migrate beyond the existing LNAPL footprint extent under conditions reasonably foreseen at the Facility ("migrating LNAPL") as described in section 4.5.3. The presence of migrating LNAPL would require additional remedial option and feasibility evaluation. The Path Forward Approach seeks to distinguish between a migrating LNAPL plume versus a non-migrating LNAPL plume (residual (immobile), mobile (but not migrating), and/or locally migrating LNAPL).

It is likely that the "free product," noted in the Group 3 SIR, is mobile or immobile LNAPL that is not migrating. The expectation is that the application of a GAC amended subaqueous cap to the lagoons irrespective of the presence and extent of mobile or immobile LNAPL will be a protective remedy. The path forward and engineering approach to address LNAPL in sediment will focus on eliminating risk by GAC amended subaqueous capping, unless migrating LNAPL is present, which may trigger additional evaluation of protective remedies.

The following engineering approaches are considered to address portions of the lagoon sediment that include visual observations of LNAPL or sheen:

- Migrating LNAPL: If LNAPL is interpreted to be migrating beyond the existing extent under conditions reasonably foreseen at the FSA, then additional engineering solutions will be evaluated to isolate, stabilize or remove the material and eliminate exposure risk if a GAC amended subaqueous cap is not protective. This type of engineered solution may consist of additional amendments to cap or other means of isolation or treatment to prevent potential future vertical and lateral migration of LNAPL that would result in a future potential exposure pathway.

- Residual LNAPL (immobile) and mobile but non-migrating LNAPL: If LNAPL is interpreted to be mobile or residual, then the native unimpacted sediment above it, and a GAC amended subaqueous cap will be considered protective to isolate this material in place as there is no potential future vertical or lateral migration beyond the existing extent.

- Sheen: If sheen is observed in sediment cores and does not have a sufficient thickness of native unimpacted sediment above it, then the GAC amended subaqueous cap is likely to be protective.

6.3.1 Groundwater Gradient Assessment

The localized vertical and horizontal gradients of the groundwater associated with the lagoon sediment will be evaluated as part of the Path Forward. This assessment addresses potential movement of LNAPL and dissolved-phase COPCs in the sediment due to hydraulic gradients between the lagoon levels and the potentiometric surface of the underlying Main Sand.

To evaluate the localized vertical gradient and connectivity between the groundwater in the A Clay, sediment pore water, and surface water within the lagoons, installation of vibrating wire piezometer triplets is proposed.

Vibrating wire piezometers measure pore water pressure in sediments and soil, and mounted as multi-level devices (triplets) that are designed to evaluate the complete vertical hydraulic profiles within lagoon sediment and underlying and adjacent soils. One location within #2 Lagoon will be selected for installation of vibrating wire piezometers, and one location on the east and west perimeters of the lagoon, respectively. At each location, the vibrating wire piezometers will be installed in shallow sediments (or soil), in deeper sediments or soil (near the base of the lagoon), and within the native material below the lagoon and at corresponding depth in the perimeter soil locations.

6.4 Lagoons: Potentially Characteristic Waste

The sediments at RSED-09 and RSED-11 had elevated concentrations of lead and benzene. As part of the Path Forward Approach, these locations and step-out locations around them will be evaluated via TCLP to determine if the material exceeds the limits for characteristic waste. For any area with chemical concentrations exceeding the limits for characteristic waste, an engineering solution will be required to manage the material by isolation, in-situ stabilization or other measures and thereby eliminate exposure risk if a GAC amended cap and the natural cap of unimpacted sediment above it is insufficiently protective

6.5 Lagoons: Approach to Feasibility of Containment (Capping)

The remediation method presented here for the lagoons, where the TARPS risk-based criteria are inapplicable (or in other areas where not met), consists of the subaqueous GAC amended capping to confine and isolate impacted material and sediment. Based on the CSM and existing data, the areas subject to confinement and isolation by subaqueous capping include all or parts of the #1 and #2 Lagoons. In addition, #3 Lagoon will be similarly capped, even though it currently lacks the LNAPL and COPC concentrations identified in the other lagoons. Capping will, by default, consist of GAC amended subaqueous capping (which isolate and contain specific mobile COPCs and migrating LNAPL [e.g., via ebullition], not contained by the existing sediment or a sand cap alone). Subaqueous capping design requirements, construction methods, and post construction monitoring requirements have been implemented across the nation, the region, and in Illinois (see for example the

Contaminated Sediments Remediation: Remedy Selection for Contaminated Sediments by the Interstate Technology Research Council [ITRC], 2014). Subaqueous capping has been used to contain the key COPCs at the FSA, including PAHs, BTEX, metals, and LNAPL under a wide variety of sediment characteristics, hydrological conditions, and water uses. The lagoons are separate from the Mississippi River except during flooding events, and do not have any current or anticipated human uses, which is a significant advantage for considering this remedy compared to sites requiring compliance with flow restrictions and/or consideration of commercial or recreational watercraft traffic.

The capping system and installation method for the lagoons is anticipated to be similar to other sites in the Midwest for freshwater systems. There are qualified contractors and equipment available to perform the work at this location. There are materials for capping available locally and, if needed, could be mobilized to the River Dock Area on barges via the river, if needed. Therefore, the lagoons provide a suitable location considering the sediments, water depths, surrounding land conditions, and viability to implement a cap to address the sediments. Completion of the proposed data gap sampling and testing is intended to provide necessary support for a decision about the approach.

6.5.1 Suitability of Lagoons for Subaqueous Capping

The evaluation of the feasibility of subaqueous capping for the contaminated materials and sediment in the FSA lagoons depends on multiple factors weighing the suitability of the area for such a remedy. The following summary (adapted from U.S.EPA 2017b) itemizes considerations for evaluating feasibility of capping. Based on this information, the option of subaqueous capping appears appropriate for this location, pending results of the data gaps evaluation outlined in this Path Forward Approach.

Sediment and Hydrological Characteristics

- **Sufficient sediment strength and cohesion.** Existing data indicate the sediment in the lagoons consists of unconsolidated silts and clay with strengths typical of other capping projects. Additional valuation of sediment characteristics is a data gap considered in this Path Forward Approach.

- **Absence of effects from cap consolidation.** Existing data suggests the lagoon sediments has characteristics suitable for the type and thickness of conventional or amended capping considered here, especially considering the bulk of COPCs are present deeper in sediments, and therefore, consolidation of the upper layers is less likely to release COPCs. Additional valuation of sediment characteristics, including the potential of consolidation bleed release of COPCs is a data gap considered in this Path Forward Approach.

- **No scouring due to flooding.** The lagoons, where capping is being considered, are not subject to currents or water movements except during flooding events. Based on location isolated from the river bed, and upgradient obstacles such as berms and vegetation, velocities are anticipated to be minor. Cap armor would be designed to prevent scouring or disturbance of the cap during flood conditions. Evaluation of potential flood disturbance is a data gap considered in this Path Forward Approach.

- **Stable shorelines.** Preliminary observations suggest that perimeters are stable, and that perimeters are amenable for any needed slope protection to secure the cap. There are no structures to interfere with the cap.

Contaminant Characteristics

- **Little or no evidence of groundwater flux.** Upwards groundwater flux needs to be low enough to minimize diffusion of COPCs through the sediment column to the overlying surface water. Groundwater flux is expected to be low or absent based on the properties of the underlying (and surrounding) A Clay separating the lagoons from the aquifer. This will be confirmed by the results of data from the Group 3 groundwater investigation.

- **Absence of contaminant flux through cap.** The cap materials (including amendments) need to be able to keep COPCs from breaking through the cap during the period of performance. The proposed approach includes the addition of GAC as an amendment as needed to address any specific issues that may require enhanced containment.

- **Contiguous contaminant distribution.** The efficiency and effectiveness of capping is dependent on capping a contiguous area of contamination. The data to date suggests that areas of substantial contamination (LNAPL and high concentrations of mixed COPCs) cover overlapping and contiguous areas, centered around the former discharge point between the #1 and #2 Lagoons. However, the entire lagoon area is proposed to be capped to eliminate the concern for full delineation of contamination.

- **No release of residual (immobile) COPCs from capped areas.** Capping procedures should not release COPCs via consolidation bleed due to the cap weight. The bulk of COPCs are present deeper in sediments, and therefore, consolidation of the upper layers is less likely to release COPCs. Additional evaluation of sediment characteristics, including the potential of consolidation bleed release of COPCs is a data gap considered in this Path Forward Approach.

- **Ecological or human health is potentially moderate to high.** The current risk is deemed to be low, although certain COPCs (i.e., LNAPL) not amenable to risk assessment may be present suggesting the proposed approach as a precautionary measure. The subaqueous capping approach, presented here, is directed in large part (but not only) to addressing such COPCs.

- **Long term risk reduction greater than adverse effects of alternate measures.** The proposed approach is likely to eliminate exposure for the period of performance, while resulting in considerably less short-term impacts than more aggressive remedies.

Location and Land Use

- **Lack of sensitive local infrastructure.** There is little essential infrastructure present in or near the lagoons that would require consideration during the remedy decision. Infrastructure is limited to National Pollutant Discharge Elimination System (NPDES) conveyance, power, and pipeline rights of way across and under portions of the lagoons. There is no infrastructure such as piers, wharves, bridges, or navigation channels to address in the FSA. The levee itself is not expected to be affected by the remedy.

- **Adequate water depth.** There is no boat traffic on the lagoons requiring sufficient channel or water depth, so no current uses would be disturbed. The current water depths, which are 4 to 6 feet in the lagoons, are adequate to provide protection for underlying sediment from weather related disturbance and sufficiently deep to permit the use of watercraft during construction.

- **Human disruption low or controllable.** The lagoons are on private property and all access is controllable. Human use is limited to occasional trespassers.

- **Institutional controls unable to fully address human exposure.** While current levels of trespassing are very low, and the River Dock Area is guarded to prevent unauthorized access, institutional controls would not by themselves eliminate all potential exposure to the sediment, suggesting that an isolation and confinement remedy for potentially impacted sediment is appropriate.

- **Access and material available.** The river-side location of the lagoons suggests convenient access via river barge may be available, facilitating the transport of suitable materials from source areas and preventing disturbance to neighboring areas from truck traffic.

6.5.2 Applicability of Subaqueous Capping

The preliminary data indicate that the COPCs are mainly within the waste material in the deeper sediments and a layer of cleaner sediments (3 to 6 feet) has been deposited over the COPCs including LNAPL. The surficial layer of sediments has the potential to be beneficially used as a physical isolation and confinement layer as part of a subaqueous cap. In a conventional cap design, these cleaner sediments would be capped with a sand layer and in some cases gravel or stone layers to compress and confine the surface sediments. The cap would consolidate the surficial sediments increasing density, percent solids, and undrained shear strength, while releasing some consolidation water. This new layer of soil (sand and gravel) creates a controlled layer with specified thickness and physical properties. Because some of the sediment in the lagoons contains COPCs (e.g., LNAPL) which can more readily be mobilized to the surface via processes such as ebullition, the sand layer will be amended throughout with GAC to contain these COPCs.

The design of the capping system for the lagoon sediments will include an evaluation of the placement methods, thickness/confinement weight requirements, and long- term stability against natural forces. The thickness of the sand is also influenced by the method of placement to create uniform conditions based on the sediment properties. The cap material will become the new interface with lagoon water and strata which will support aquatic species development.

The capping design will include an evaluation of the flow patterns and velocities within and between the lagoons during flood events. The capping system will be designed based on the flow model to ensure the cap remains in place based on the foreseeable flow conditions. This may require the installation of gravel or stone layers to armor the cap to ensure it remains in place as needed.

The base capping system requires lateral containment which includes the lagoon shorelines. The design evaluation will include the types of shoreline and subsurface lagoon sidewall slope stability. The analysis will determine if bio-stabilization will resist anticipated forces or if additional measures, up to including rip rap, is needed.

Capping equipment access is required to the lagoons. Typically, the capping systems include equipment mounted on barge systems with shoreline cabling to control movement. The general procedure is to install an access ramp into each lagoon with the use of rock and gravel. The design will include an evaluation to determine if the access ramp material will displace any sediments.

Although the sediment analysis conducted to date suggests limited potential for contaminant mobility or the likely occurrence of ebullition derived LNAPL, the design considerations will by default include a GAC amendment for the sand to provide containment. The design will

include an analysis of methods to add the amendments to the sand that will result in uniform and consistent placement.

If additional data or the design process shows that conventional or amended subaqueous capping is not an effective remedy for portions of the FSA, additional measures will be considered.

6.5.3 Sediment Stability

Even if current risk is minimal based on the additional surficial sediment data results, an understanding of sediment stability may be needed to document that the buried residual contamination will not be remobilized under reasonably foreseeable conditions following seasonal flood inundation from the Mississippi River.

Current site understanding assumes that the high concentrations of COPCs are present mostly in the #1 and #2 Lagoons, and are buried at depths exceeding 3 feet. Our current understanding is that after the lagoons were no longer used for waste water treatment, the overlying sediment, generated from over 30 years of deposition from inundations, decaying organic matter, and runoff influx, has buried much of the sediments containing high concentrations of COPCs. Visual evidence and available sediment data suggest a stable or aggrading layer of depositional sediment, and so far, as we are aware, no extensive erosion has been observed during the periodic inundations.

The need and scope for evaluation of the sediment stability in the affected areas will be determined in consultation with Illinois EPA and may include, but not limited to:

- Historical review – evaluation of local, regional, and USACE data and history documenting flows and/or suggesting destructive (erosional) effects in the lagoons and ponds to evaluate the potential for scouring floods.

- Geomorphic assessment – evaluation of existing sediment texture, thickness, and stratification as well as the distribution of residual COPCs to estimate the depositional environment, rates, and sensitivity to erosional flows.

- Potential use of predictive modeling (e.g., HEC-RAS) to estimate flow conditions that could result in erosion and consequent potential remobilization.

6.5.4 Integrity of Lagoon Isolation

The proper installation of a subaqueous capping system that is designed for the sediment properties and the COPCs, will be fully contained. The site data indicates the presence of the native clayey soil (A Clay) unit around and under the lagoons functioning as an aquitard and providing isolation from the underlying aquifer. The cap installation will isolate the

impacted sediments and consolidate the existing surficial clean sediments to provide improved physical characteristics such as lower permeability. The GAC amendment to the sand cap will further address the containment of any potentially mobile constituents within the lagoons where LNAPL is detected.

With the cap designed to withstand anticipated site forces such as flooding, wave action, or wildlife, the sediments on the site will remain contained along with any COPCs including non-migrating LNAPL they may contain. Shoreline stability, provided by proper evaluation, design, and construction, will also prevent the movement or transfer of potentially COPC laden sediment between the lagoons. The stable side slopes will contain the cap and site sediments within a designated horizontal limit.

A geotechnical boring evaluation of the perimeter of the lagoons will be conducted to confirm the low permeability and stability of the surrounding native clay soils.

Institutional controls and documentation of FSA conditions will limit future exposure of the sediment. Measures can be implemented in the capping construction to account for utility corridor access and overhead power structure maintenance and repair. Long term monitoring and maintenance would minimize the potential for disturbance of the cap by wildlife or aquatic animals.

6.5.5 Geotechnical Considerations

Past capping design procedures and placement methods have shown that sand with amendments can be placed uniformly so it does not displace soft sediments such as those identified in the FSA. The initial geotechnical characterization of the sediments indicates that while soft, they will have the required shear strength to support the placement of the cap. The moisture contents reported indicate the sediments are unconsolidated at the surface, but have densified with depth. This indicates that the removal of pore water from the weight of the cap will result in material that can support the minimal load of a conventional sand cap. The sand can be designed to match the required gradation for the confinement and drainage of the silts and clays.

A survey of the lagoon bed will be conducted to evaluate topography and presence of debris

6.5.6 Additional Considerations

The additional testing proposed for the lagoons will determine if the COPCs can be mobilized by vertical advection or by the contaminant bleed due to installation of the cap system. The sand used for conventional capping can be amended with various materials to contain potential releases, in addition to the sorption provided by the native sediment. Available amendments for the cap include in addition to the proposed GAC amended cap, among others, bentonite (for increased permeability control), organoclays (for control of

LNAPL), and phosphate additions (for metals control). For the contaminants at the lagoons, a GAC amended cap is proposed as protective under any condition except potentially where migrating LNAPL or material exceeding the limits for characteristic waste may be locally present. Presented below are some preliminary criteria (from Schroeder, 2016) for evaluating when conventional vs. amended capping are more suitable:

	Conventional capping	Amended capping
Groundwater Flux	<0.5 cm/day	> 1 cm/day
Contaminant Mobility	Kd >10,000	Kd<3,000
LNAPL type	Below Residual	Above residual
Desired risk reduction factor	< 300 times	> 1000 times
Allowable cap thickness	Thick	Thin

The amendment can be included in the design at the appropriate mix percentage and thicknesses to accommodate the potential to mobilize the specific COPCs. While not anticipated, a manufactured reactive mat could be utilized in discrete portions of the Facility where contaminant mobility is identified.

Continued native Mississippi River sediment deposition in the FSA is anticipated to continue with future flooding. With a secure cap, the new sediments will accumulate over them and ultimately increase the thickness of the isolation layer.

If, based on the evaluation, the proposed approach is found to be insufficient or inappropriate, the nature of appropriate further responses will be considered.

7. MONITORING AND INSTITUTIONAL CONTROLS

The proposed remedy includes areas (the ponds) subject to the draft TARPS risk based approach, and areas (the lagoons) subject to engineered subaqueous capping. For the lagoons, where an engineered subaqueous cap is the preferred alternative, a corrective measure monitoring program intended to demonstrate the corrective measures protect human health and the environment, and control contaminant migration will be needed. Institutional controls may also be needed.

The appropriate monitoring needs, and any needed institutional controls will be further evaluated once the remedy has been designed.

7.1 Monitoring

The monitoring program will consider:

- Baseline (pre-remediation) conditions. The pre-remediation baseline evaluation will include surface water sampling to set the expected surface water conditions. Surface water samples will be collected y with but prior tothe previously described field activities.

- Construction Monitoring. Monitoring during implementation of subaqueous capping will be needed (turbidity, cap thickness, and avoidance of entrapment or mortality of aquatic biota). Following placement of the cap, capped areas will be re-surveyed to document completeness and provide a baseline for comparison with surveys in the post construction period.

- Post-Remedy Monitoring to confirm absence of risk to human health and the environment. A post-remedy monitoring program will include: (1) surface water sampling (including an adaptive management follow-up sampling program to address any observed COPC spike), (2) monitoring of the re-establishment of benthic biota, (3) observations of signs of ebullition or sheening on the lagoons. Benthic and surface water monitoring will occur immediately after remedy implementation and then annually. If there is no detection of any COPCs above pre-determined baseline levels for 3 consecutive years, monitoring will be reduced to every 3 years for the period of performance.

- Post- remedy Monitoring to confirm cap stability and lack of migration. The capped area will be monitored monthly for 2 to 4 months for evidence of displacement or major disturbances. Measurements to the cap surface will be made and compared to the initial bathymetric survey to monitor the completion of

anticipated consolidation and to monitor deposit and/or erosion of sediment. The cap should be monitored annually and following major flood events for 3 years, and then every 5 years to assess the integrity of the cap using a sonar scan and limited elevation survey. Once documentation exists that sufficient new sediment has been deposited over the cap, the monitoring can be reduced to monitoring following major flood events, defined as standing water depths over the top of the cap of 15 feet or greater. Eventually the open water condition at the site will be minimized by continued river sediment deposition.

- Groundwater monitoring. It is expected that the investigation outlined in this Path Forward Approach will find that there is little or no groundwater migration in or out of the lagoons. However, one or more of the existing or planned groundwater monitoring wells, located potentially downgradient of the lagoons and which are planned as part of the Group 3 Ground Water Investigation, will be used to monitor groundwater quality.

7.2 Institutional Controls

Access restrictions are in place currently limiting any access to the FSA to authorized personnel only. Premcor will review and potentially enhance security measures to reduce and eliminate unauthorized access to the River Dock Area, including the FSA by trespassers. Measures may include improved signage, augmented surveillance or other measures.

The use of institutional controls may be needed as part of Corrective Action Objectives for the FSA. The FSA would be covered under any institutional controls for the River Dock Areas under the draft "Corrective Action Objectives Report Partial Closure Area River Dock Area" (SMA, 2017b) and, in addition, consider:

- Requiring any excavation or disturbance of the sediment cap due to utilities installation or repair (pipelines, overhead power lines, sewers) to be conducted only if accompanied with the proper precautions to ensure cap integrity ("Soil Management Plan").

- Recording appropriate deed restrictions limiting future intrusive activity in the FSA based on the nature and extent of contamination associated with the sediments, and the characteristics of the remedy.

Current or subsequent owners will thereby be required to maintain the established controls and monitoring programs.

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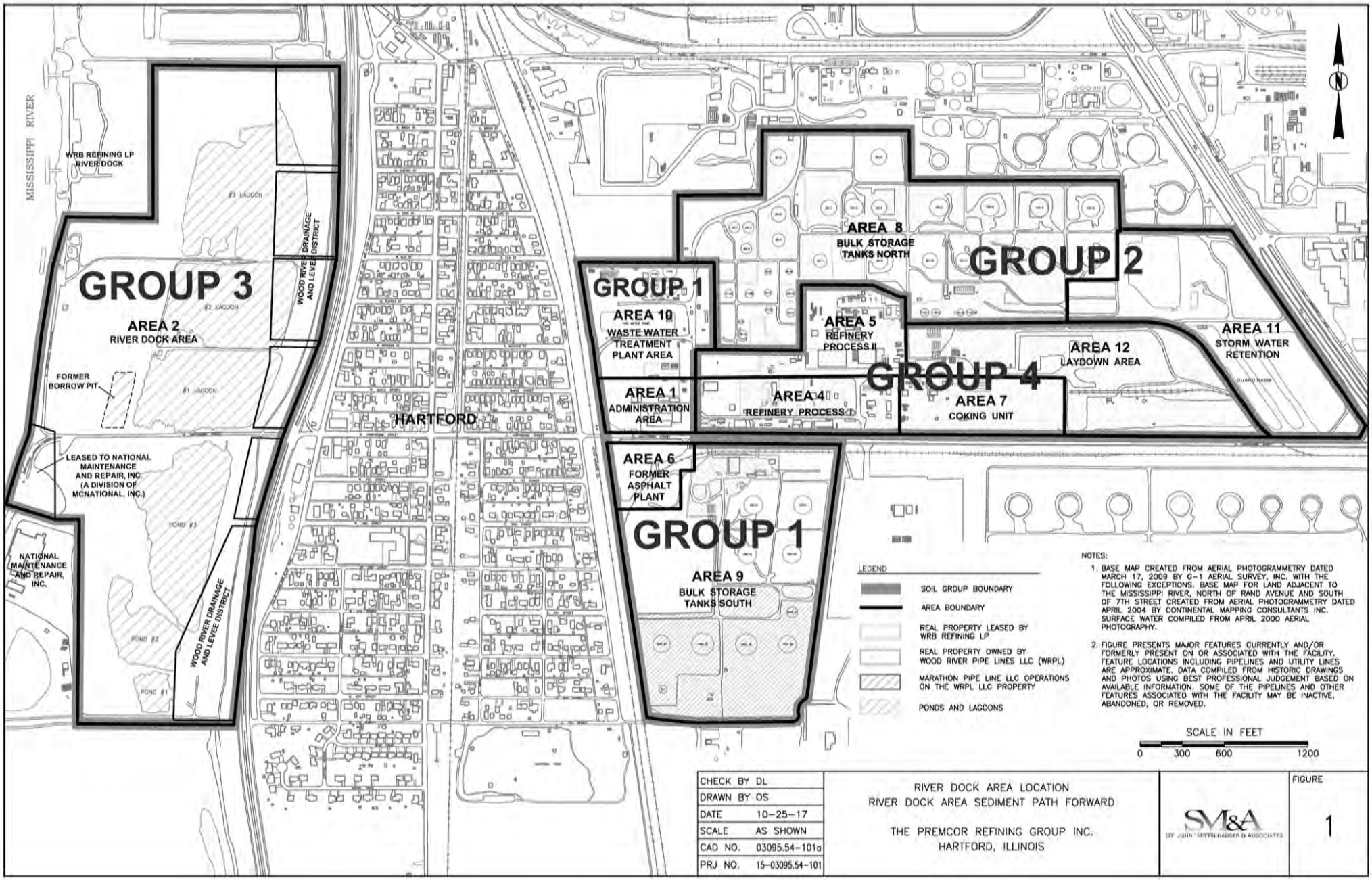
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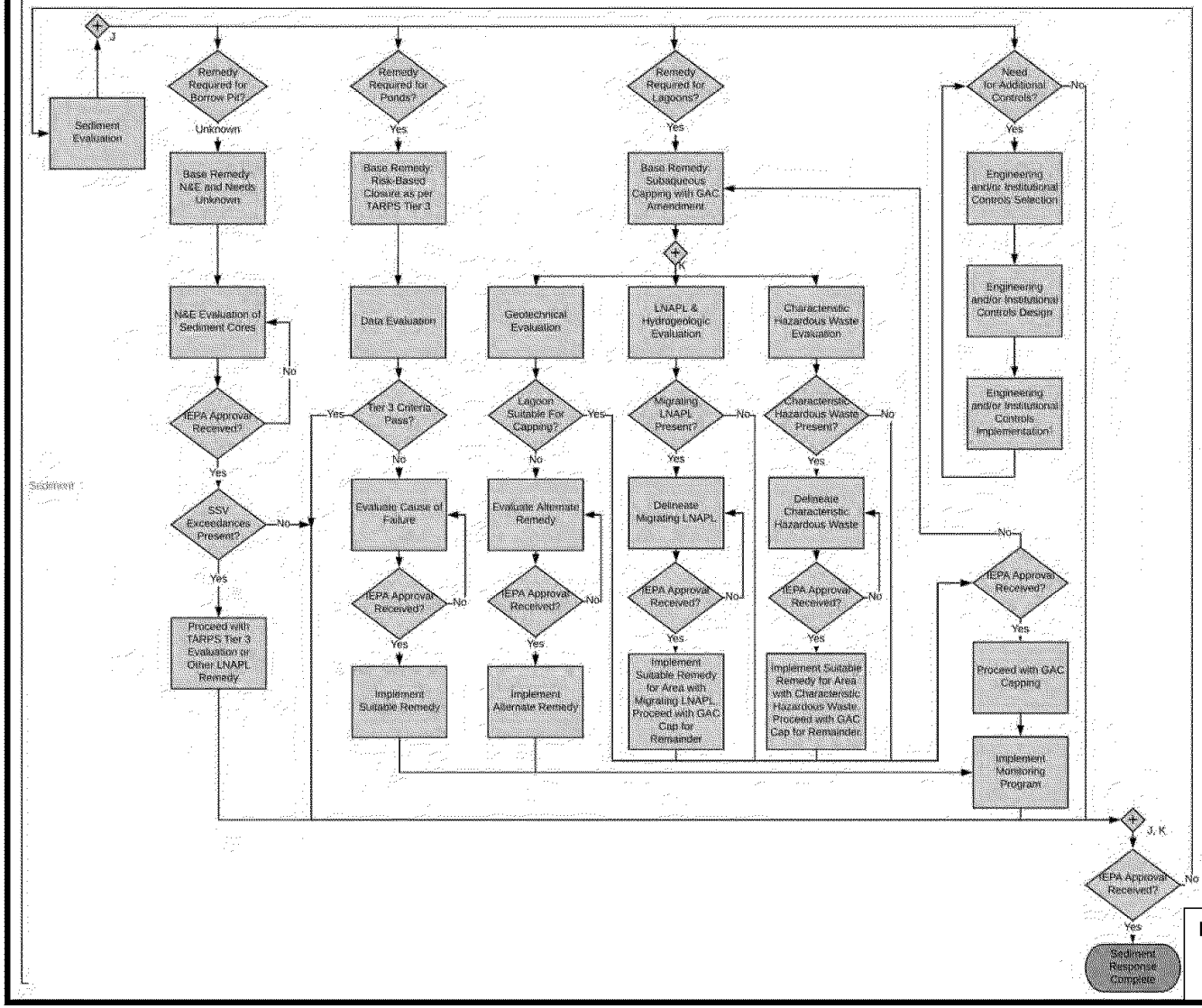
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Figures


MISSISSIPPI RIVER
WRB REFINING LP RIVER DOCK
#3 LAGOON
#2 LAGOON
#1 LAGOON
WOOD RIVER DRAINAGE AND LEVEE DISTRICT
GROUP 3
AREA 2
RIVER DOCK AREA
FORMER BORROW PIT
LEASED TO NATIONAL MAINTENANCE AND REPAIR, INC. (A DIVISION OF MCNATIONAL, INC.)
POND #3
POND #2
POND #1
NATIONAL MAINTENANCE AND REPAIR, INC.
WOOD RIVER DRAINAGE AND LEVEE DISTRICT
HARTFORD
GROUP 1
AREA 10
WASTE WATER TREATMENT PLANT AREA
AREA 1
ADMINISTRATION AREA
AREA 8
BULK STORAGE TANKS NORTH
GROUP 2
AREA 5
REFINERY PROCESS II
AREA 4
REFINERY PROCESS I
GROUP 4
AREA 7
COKING UNIT
AREA 12
LAYDOWN AREA
AREA 11
STORM WATER RETENTION
AREA 6
FORMER ASPHALT PLANT
GROUP 1
AREA 9
BULK STORAGE TANKS SOUTH
LEGEND
SOIL GROUP BOUNDARY
AREA BOUNDARY
REAL PROPERTY LEASED BY WRB REFINING LP
REAL PROPERTY OWNED BY WOOD RIVER PIPE LINES LLC (WRPL)
MARATHON PIPE LINE LLC OPERATIONS ON THE WRPL LLC PROPERTY
PONDS AND LAGOONS
NOTES:
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2009 BY G-1 AERIAL SURVEY, INC. WITH THE FOLLOWING EXCEPTIONS. BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC. SURFACE WATER COMPILED FROM APRIL 2000 AERIAL PHOTOGRAPHY.
2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY AND/OR FORMERLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. FEATURE LOCATIONS INCLUDING PIPELINES AND UTILITY LINES ARE APPROXIMATE. DATA COMPILED FROM HISTORIC DRAWINGS AND PHOTOS USING BEST PROFESSIONAL JUDGEMENT BASED ON AVAILABLE INFORMATION. SOME OF THE PIPELINES AND OTHER FEATURES ASSOCIATED WITH THE FACILITY MAY BE INACTIVE, ABANDONED, OR REMOVED.
SCALE IN FEET
0 300 600 1200
CHECK BY DL
DRAWN BY OS
DATE 10-25-17
SCALE AS SHOWN
CAD NO. 03095.54-101a
PRJ NO. 15-03095.54-101
RIVER DOCK AREA LOCATION
RIVER DOCK AREA SEDIMENT PATH FORWARD
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
ST. JOHN, MITTELHAUSER & ASSOCIATES
FIGURE
1

SR000366



Notes:
Additional presumptive remedies added in the future could also be considered to achieve the sediment metrics. The applicability of the additional remedies would be outlined in a modification report.

This plan assumes that all third party property owners or controlling permit entities will approve the plan and allow access to the entirety of the area to perform the work.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

J,K - Letters identify each unique concurrent pathway.

1 - Institutional controls that specify that no disturbance can occur without precautions to prevent exposure, and minimize unauthorized access, include deed records, access control, access permitting, work permits, and other controls for each affected property. Planned disturbance, such as maintenance or construction activities, will require a Soil Management Plan to specify worker protection measures for each affected property.

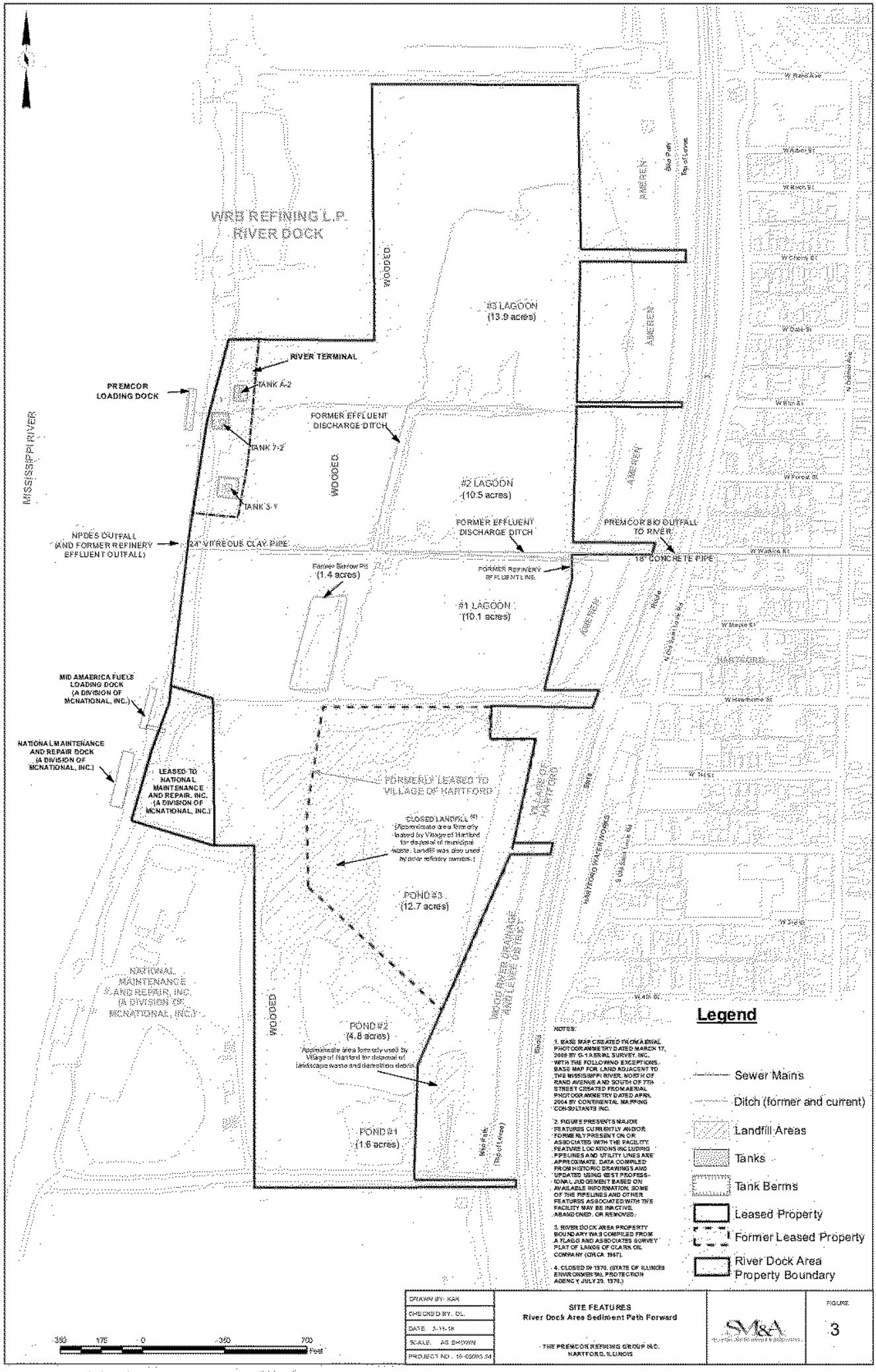
Definitions:
IEPA - Illinois Environmental Protection Agency
GAC - granular activated carbon
LNAPL - Light Non-Aqueous Phase Liquid
N&E - Nature and extent
SSV - Sediment Screening Value
TARPS - Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments

GEI

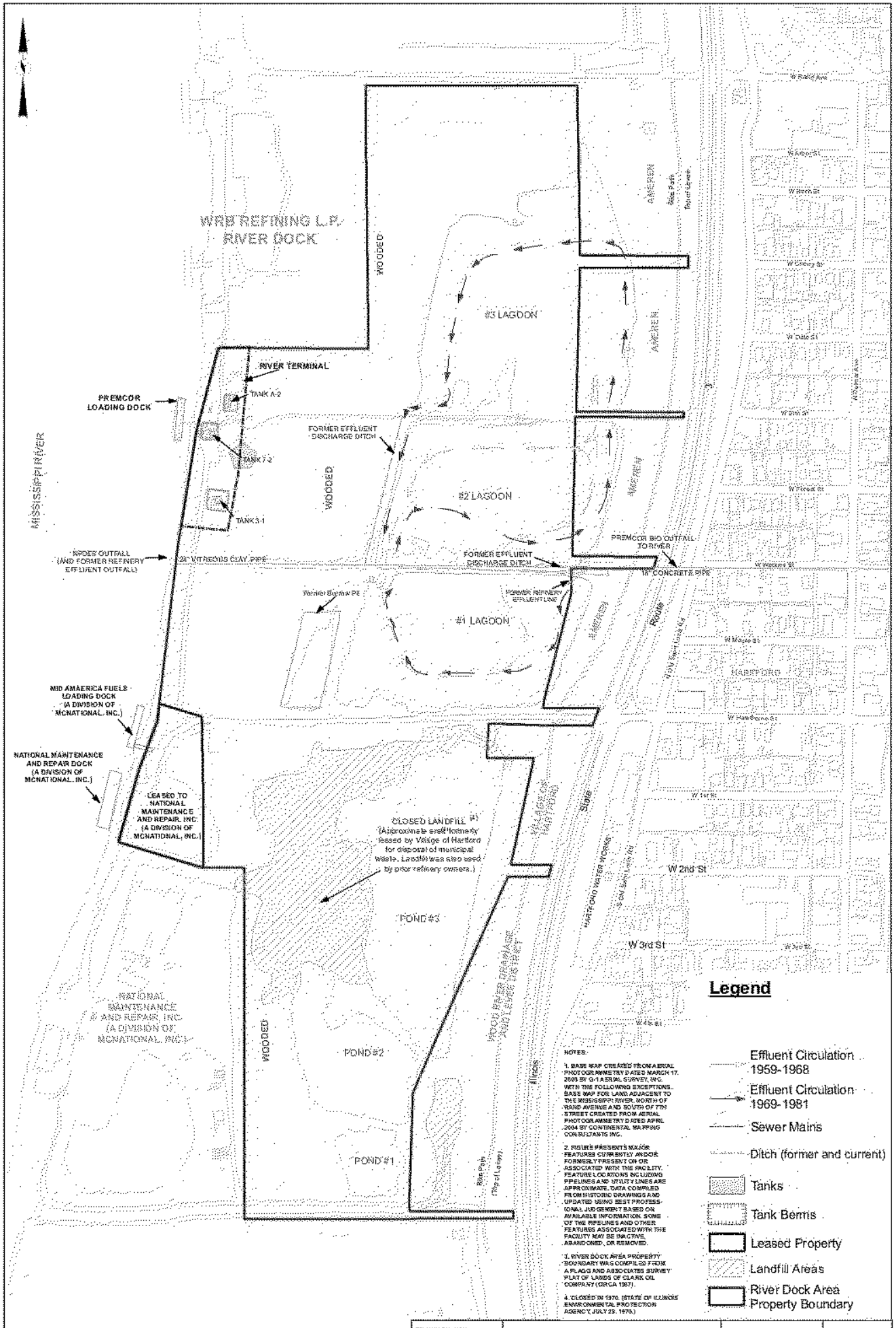
FACILITY SEDIMENTS AREA EVALUATION PLAN
River Dock Area Sediment Path Forward
THE PREMCOR REFINING GROUP, INC.

Figure
2

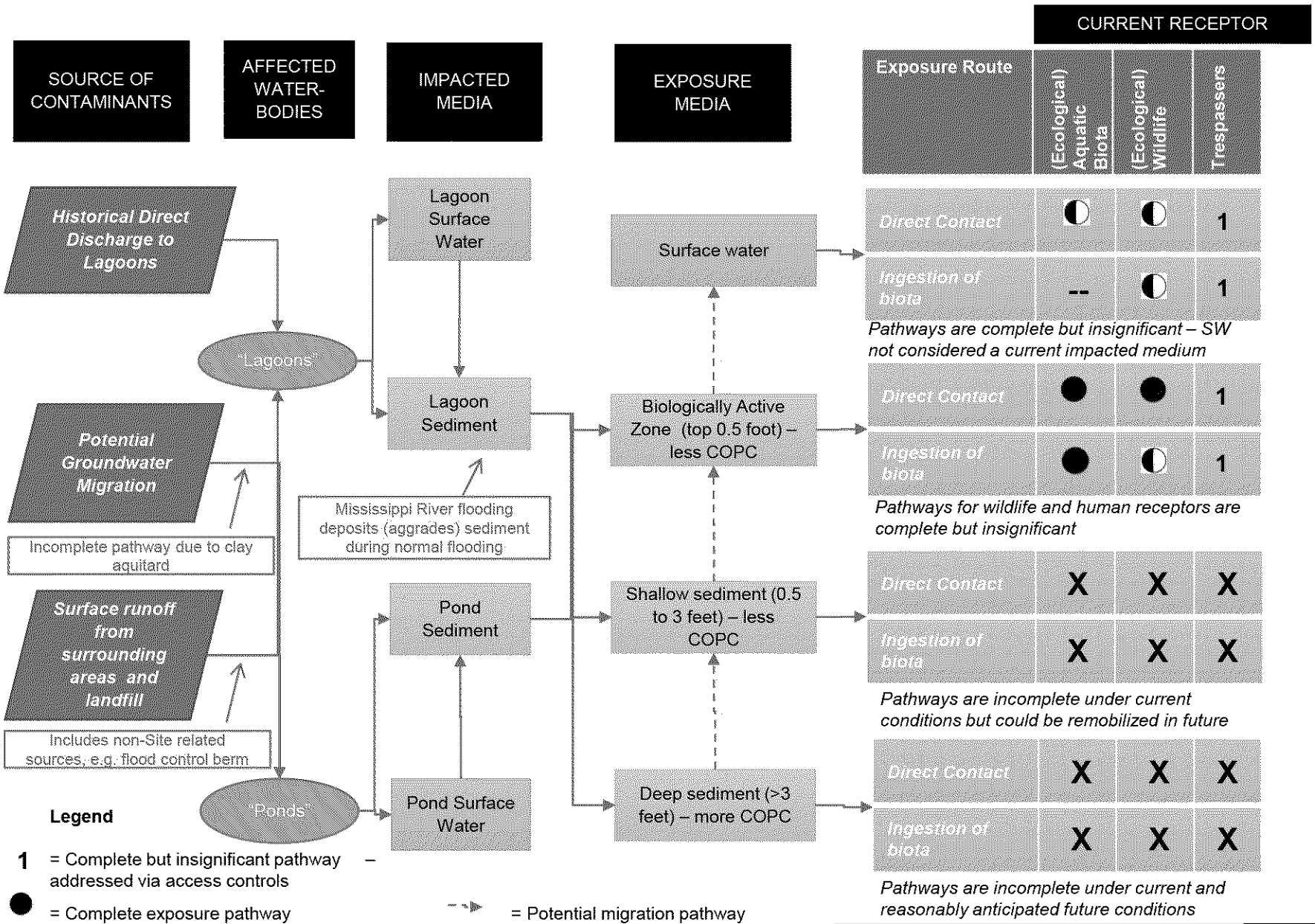
SR000367


WRB REFINING L.P.
RIVER DOCK
#3 LAGOON
(13.9 acres)
#2 LAGOON
(10.5 acres)
#1 LAGOON
(10.1 acres)
RIVER TERMINAL
PREMCOR
LOADING DOCK
TANK A-2
TANK 7-2
TANK 3-Y
FORMER EFFLUENT
DISCHARGE DITCH
FORMER EFFLUENT
DISCHARGE DITCH
NPDES OUTFALL
(AND FORMER REFINERY
EFFLUENT OUTFALL)
24" VITREOUS CLAY PIPE
PREMCOR NPDES OUTFALL
TO RIVER
18" CONCRETE PIPE
Former Skimmer Pit
(1.4 acres)
FORMER REFINERY
EFFLUENT LINE
MID AMERICA FUELS
LOADING DOCK
(A DIVISION OF
MCNATIONAL, INC.)
NATIONAL MAINTENANCE
AND REPAIR DOCK
(A DIVISION OF
MCNATIONAL, INC.)
LEASED TO
NATIONAL
MAINTENANCE
AND REPAIR, INC.
(A DIVISION OF
MCNATIONAL, INC.)
FORMERLY LEASED TO
VILLAGE OF HARTFORD
CLOSED LANDFILL (4)
(Approximate area formerly
leased by Village of Hartford
for disposal of municipal
waste. Landfill was also used
by prior refinery owners.)
POND #3
(12.7 acres)
NATIONAL
MAINTENANCE
AND REPAIR, INC.
(A DIVISION OF
MCNATIONAL, INC.)
POND #2
(4.8 acres)
Approximate area formerly used by
Village of Hartford for disposal of
landscape waste and demolition debris
POND #1
(1.6 acres)
WOODED
WOODED
WOODED
MISSISSIPPI RIVER
ABERDEEN
W Rand Ave
W Walnut St
W Elm St
W Cherry St
W Oak St
W Main St
W Forest St
W Maple St
W Hawthorne St
W 1st St
W 2nd St
W 4th St
Bike Path
(Top of Levee)
Bike Path
(Top of Levee)
Legend
Sewer Mains
Ditch (former and current)
Landfill Areas
Tanks
Tank Berms
Leased Property
Former Leased Property
River Dock Area
Property Boundary
NOTES:
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2008 BY G-1 AERIAL SURVEY, INC., WITH THE FOLLOWING EXCEPTIONS. BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC.
2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY AND/OR FORMERLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. FEATURE LOCATIONS INCLUDING PIPELINES AND UTILITY LINES ARE APPROXIMATE. DATA COMPILED FROM HISTORIC DRAWINGS AND UPDATED USING BEST PROFESSIONAL JUDGEMENT BASED ON AVAILABLE INFORMATION. SOME OF THE PIPELINES AND OTHER FEATURES ASSOCIATED WITH THE FACILITY MAY BE INACTIVE, ABANDONED, OR REMOVED.
3. RIVER DOCK AREA PROPERTY BOUNDARY WAS COMPILED FROM A FLAGG AND ASSOCIATES SURVEY PLAT OF LANDS OF CLARK OIL COMPANY (CIRCA 1987).
4. CLOSED IN 1970. (STATE OF ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, JULY 29, 1970.)
DRAWN BY: KAK
CHECKED BY: DL
DATE: 5-11-18
SCALE: AS SHOWN
PROJECT NO.: 16-00095.04
SITE FEATURES
River Dock Area Sediment Path Forward
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
FIGURE
3
350 175 0 350 700
Feet

SR000368


WRB REFINING L.P.
RIVER DOCK
WOODED
#3 LAGOON
RIVER TERMINAL
TANK A-2
PREMCOR LOADING DOCK
FORMER EFFLUENT DISCHARGE DITCH
TANK 7-2
TANK 3-1
MISSISSIPPI RIVER
#2 LAGOON
NPDES OUTFALL (AND FORMER REFINERY EFFLUENT OUTFALL)
24" VITREOUS CLAY PIPE
PREMCOR BIO OUTFALL TO RIVER
18" CONCRETE PIPE
FORMER REFINERY EFFLUENT LINE
#1 LAGOON
MID AMAERICA FUELS LOADING DOCK (A DIVISION OF MCNATIONAL, INC.)
NATIONAL MAINTENANCE AND REPAIR DOCK (A DIVISION OF MCNATIONAL, INC.)
LEASED TO NATIONAL MAINTENANCE AND REPAIR, INC. (A DIVISION OF MCNATIONAL, INC.)
CLOSED LANDFILL (4)
(Approximate area formerly leased by Village of Hartford for disposal of municipal waste. Landfill was also used by prior refinery owners.)
POND #3
POND #2
POND #1
NATIONAL MAINTENANCE AND REPAIR, INC. (A DIVISION OF MCNATIONAL, INC.)
W 2nd St
W 3rd St
Legend
Effluent Circulation 1959-1968
Effluent Circulation 1969-1981
Sewer Mains
Ditch (former and current)
Tanks
Tank Berms
Leased Property
Landfill Areas
River Dock Area Property Boundary
NOTES:
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2005 BY G-1 AERIAL SURVEY, INC. WITH THE FOLLOWING EXCEPTIONS: BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC.
2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY AND/OR FORMERLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. FEATURE LOCATIONS INCLUDING PIPELINES AND UTILITY LINES ARE APPROXIMATE. DATA COMPILED FROM HISTORIC DRAWINGS AND UPDATED USING BEST PROFESSIONAL JUDGEMENT BASED ON AVAILABLE INFORMATION. SOME OF THE PIPELINES AND OTHER FEATURES ASSOCIATED WITH THE FACILITY MAY BE INACTIVE, ABANDONED, OR REMOVED.
3. RIVER DOCK AREA PROPERTY BOUNDARY WAS COMPILED FROM A FLAGG AND ASSOCIATES SURVEY PLAT OF LANDS OF CLARK OIL COMPANY (CIRCA 1987).
4. CLOSED IN 1970. (STATE OF ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, JULY 29, 1976.)
350 175 0 350 700 Feet
DRAWN BY: KAK
CHECKED BY: DL
DATE: 3-11-15
SCALE: AS SHOWN
PROJECT NO.: 15-00095.04
PREMCOR RIVER DOCK AREA
LAGOON AND POND HISTORICAL DRAINAGE
River Dock Area Sediment Path Forward
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
FIGURE
4

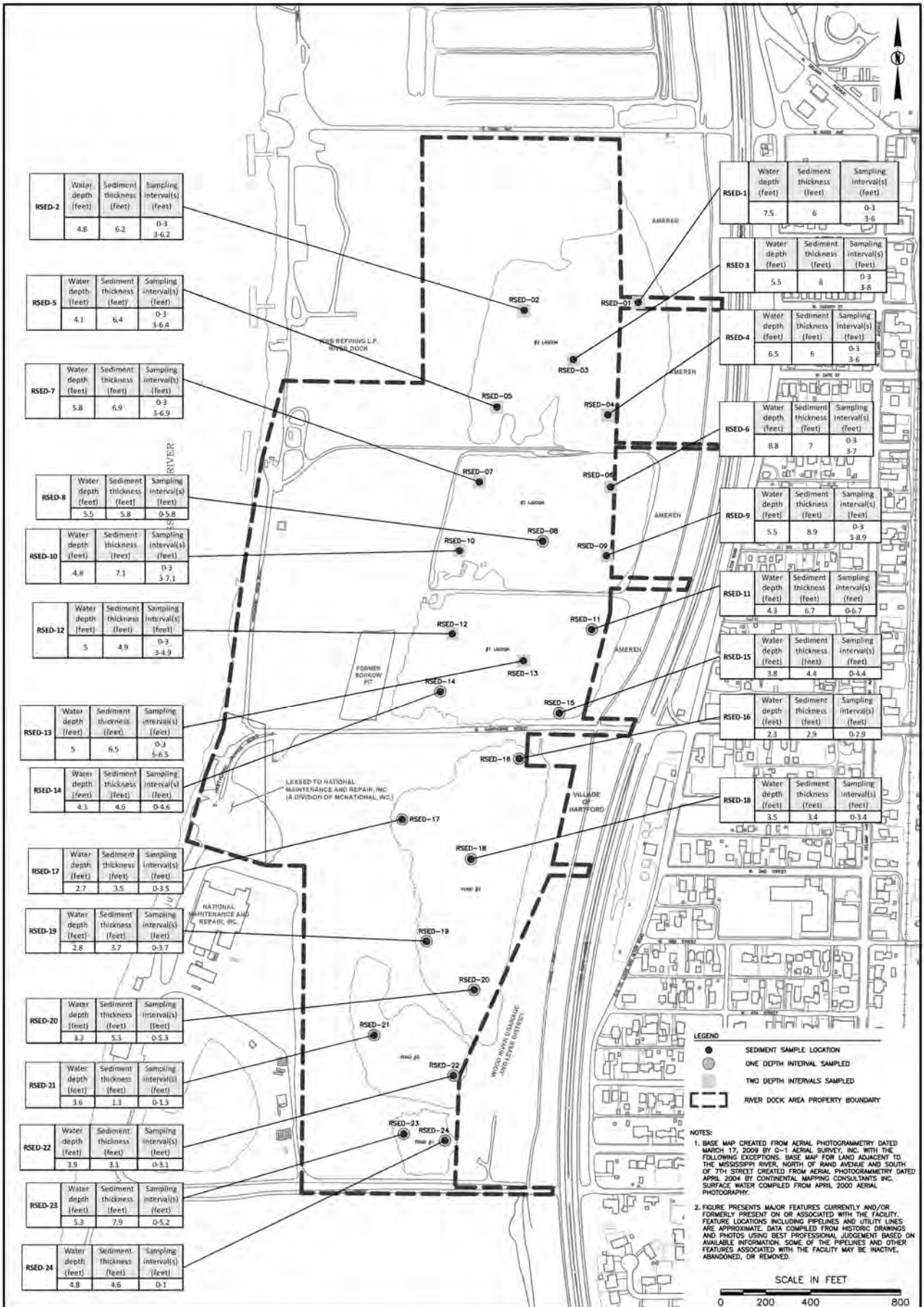
SR000369



RISK CONCEPTUAL SITE MODEL
River Dock Area Sediment Path Forward
THE PREMCOR REFINING GROUP, INC.

Figure 5

SR000370



	Water depth (feet)	Sediment thickness (feet)	Sampling interval(s) (feet)
RSED-1	7.5	6	0-3, 3-6
RSED-2	4.8	6.2	0-3, 3-6.2
RSED-3	5.5	8	0-3, 3-8
RSED-4	6.5	6	0-3, 3-6
RSED-5	4.1	6.4	0-3, 3-6.4
RSED-6	8.8	7	0-3, 3-7
RSED-7	5.8	6.9	0-3, 3-6.9
RSED-8	5.5	5.8	0-5.8
RSED-9	5.5	8.9	0-3, 3-8.9
RSED-10	4.8	7.1	0-3, 3-7.1
RSED-11	4.3	6.7	0-6.7
RSED-12	5	4.9	0-3, 3-4.9
RSED-13	5	6.5	0-3, 3-6.5
RSED-14	4.3	4.6	0-4.6
RSED-15	3.8	4.4	0-4.4
RSED-16	2.3	2.9	0-2.9
RSED-17	2.7	3.5	0-3.5
RSED-18	3.5	3.4	0-3.4
RSED-19	2.8	3.7	0-3.7
RSED-20	3.3	5.3	0-5.3
RSED-21	3.6	1.3	0-1.3
RSED-22	3.9	3.1	0-3.1
RSED-23	5.3	7.9	0-5.2
RSED-24	4.8	4.6	0-1

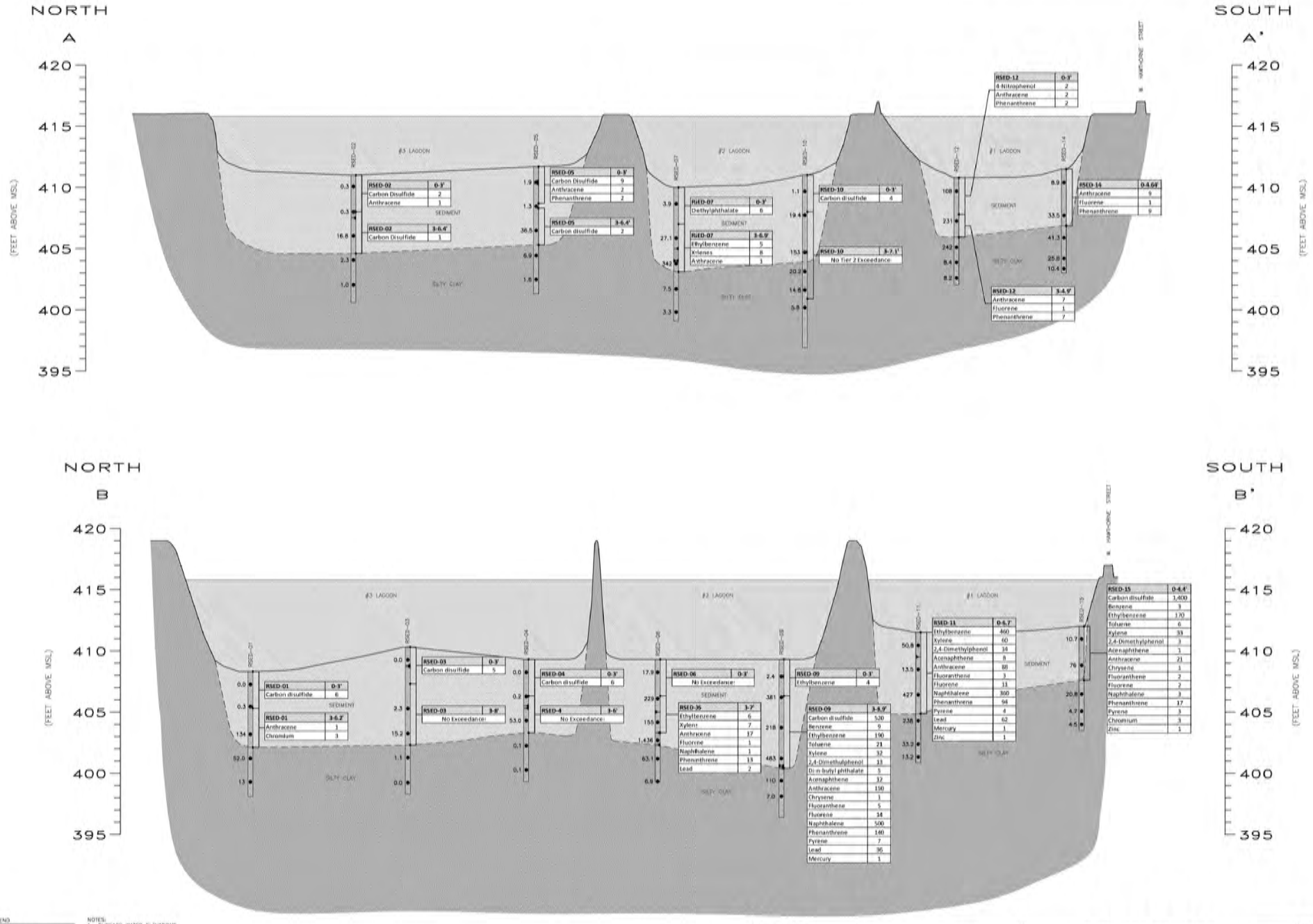
CHECK BY	DL
DRAWN BY	OS
DATE	10-25-17
SCALE	AS SHOWN
CAD NO.	03095.54-101D2
PRJ NO.	15-03095.54

EXISTING SEDIMENT SAMPLING LOCATIONS
RIVER DOCK AREA SEDIMENT PATH FORWARD

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SM&A

FIGURE 6

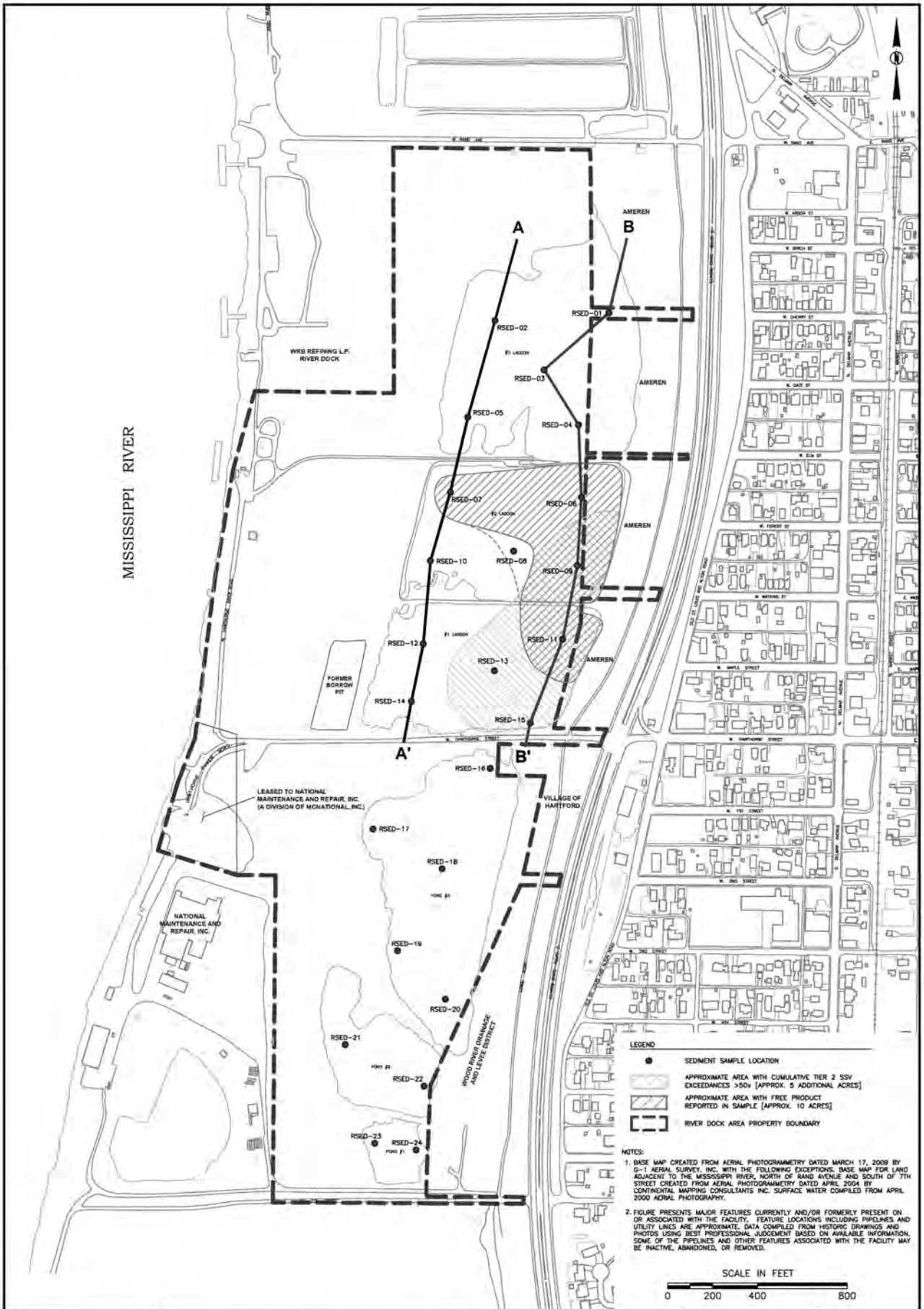


CHECK BY: DJL	
DRAWN BY: OS	
DATE: 1-23-18	
SCALE: AS SHOWN	
CAD NO.: 03095253012	
PRJ NO.: 15-03095.25-301	

SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES

PROFILES A-A' AND B-B'
RIVER DOCK AREA SEDIMENT PATH FORWARD
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

FIGURE 7



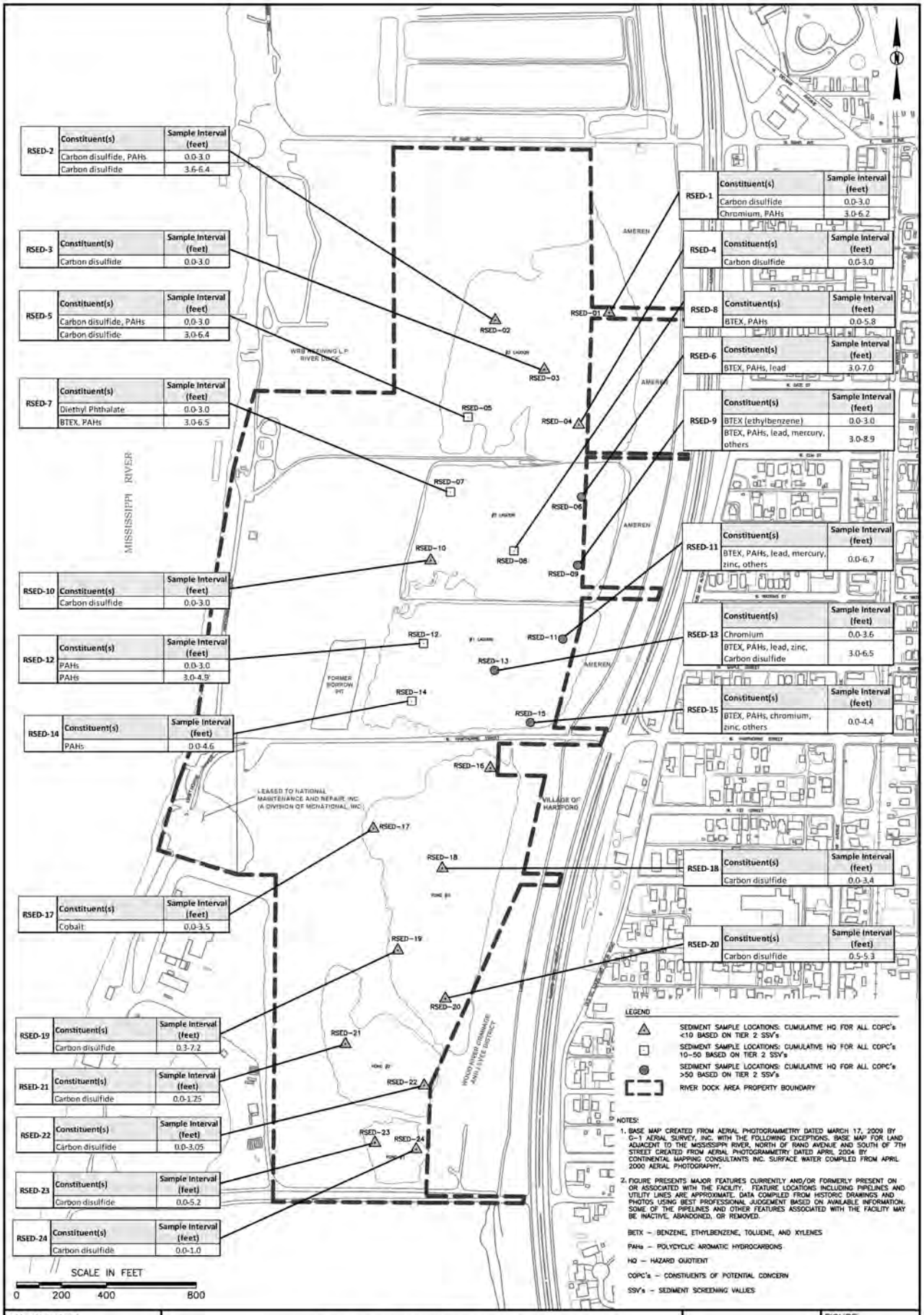
CHECK BY	DJL
DRAWN BY	OS
DATE	1-9-18
SCALE	AS SHOWN
CAD NO.	0309525301Z1
PRJ NO.	15-03095.25-301

ESTIMATED EXTENT OF SEDIMENT THAT MAY REQUIRE REMEDIATION
RIVER DOCK AREA SEDIMENT PATH FORWARD

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SM&A

FIGURE 8



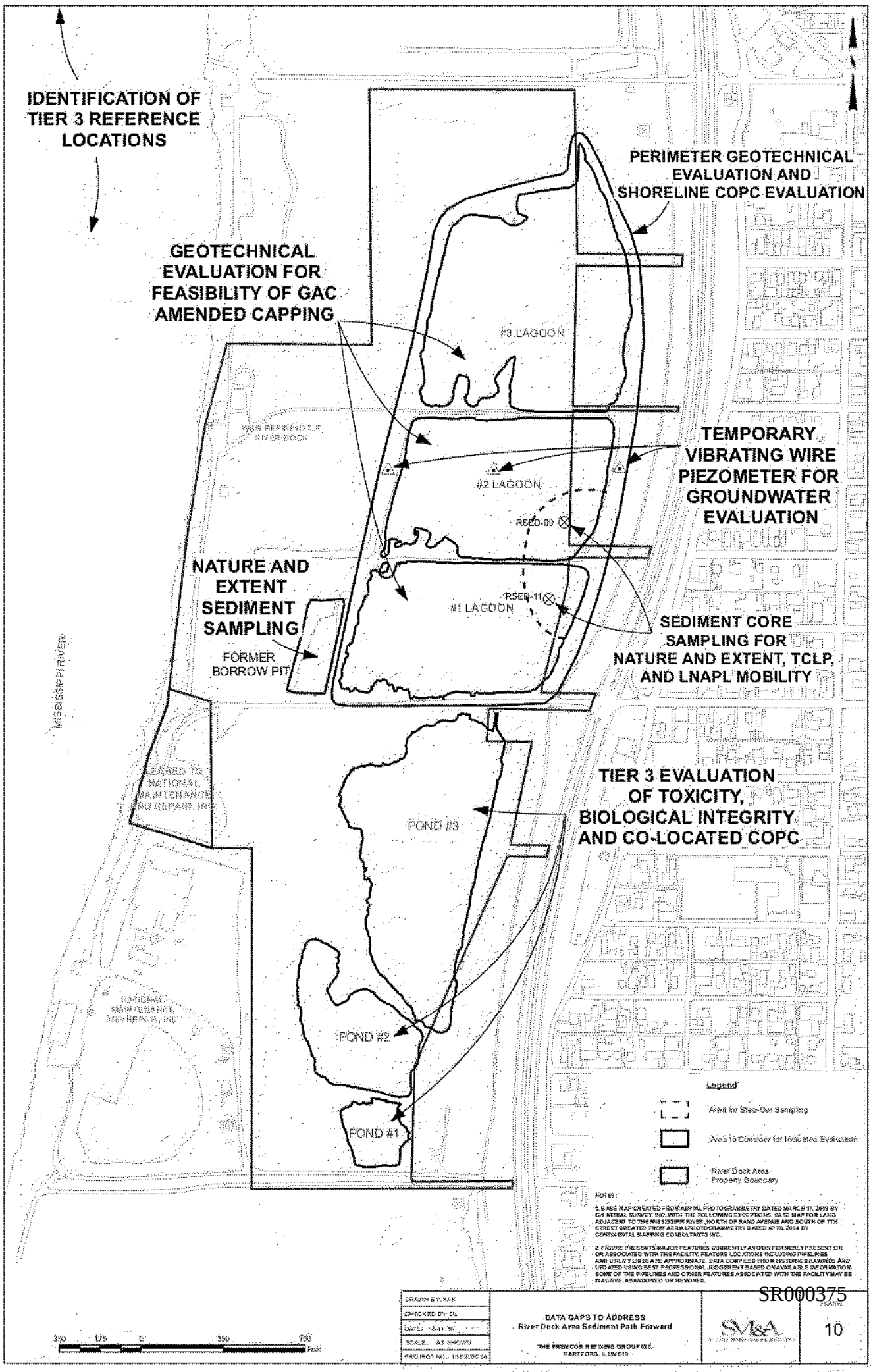
CHECK BY	DL
DRAWN BY	OS
DATE	1-23-17
SCALE	AS SHOWN
CAD NO.	03095.54-101D3
PRJ NO.	15-03095.54

LOCATIONS EXCEEDING TIER 2 SSV'S
RIVER DOCK AREA SEDIMENT PATH FORWARD

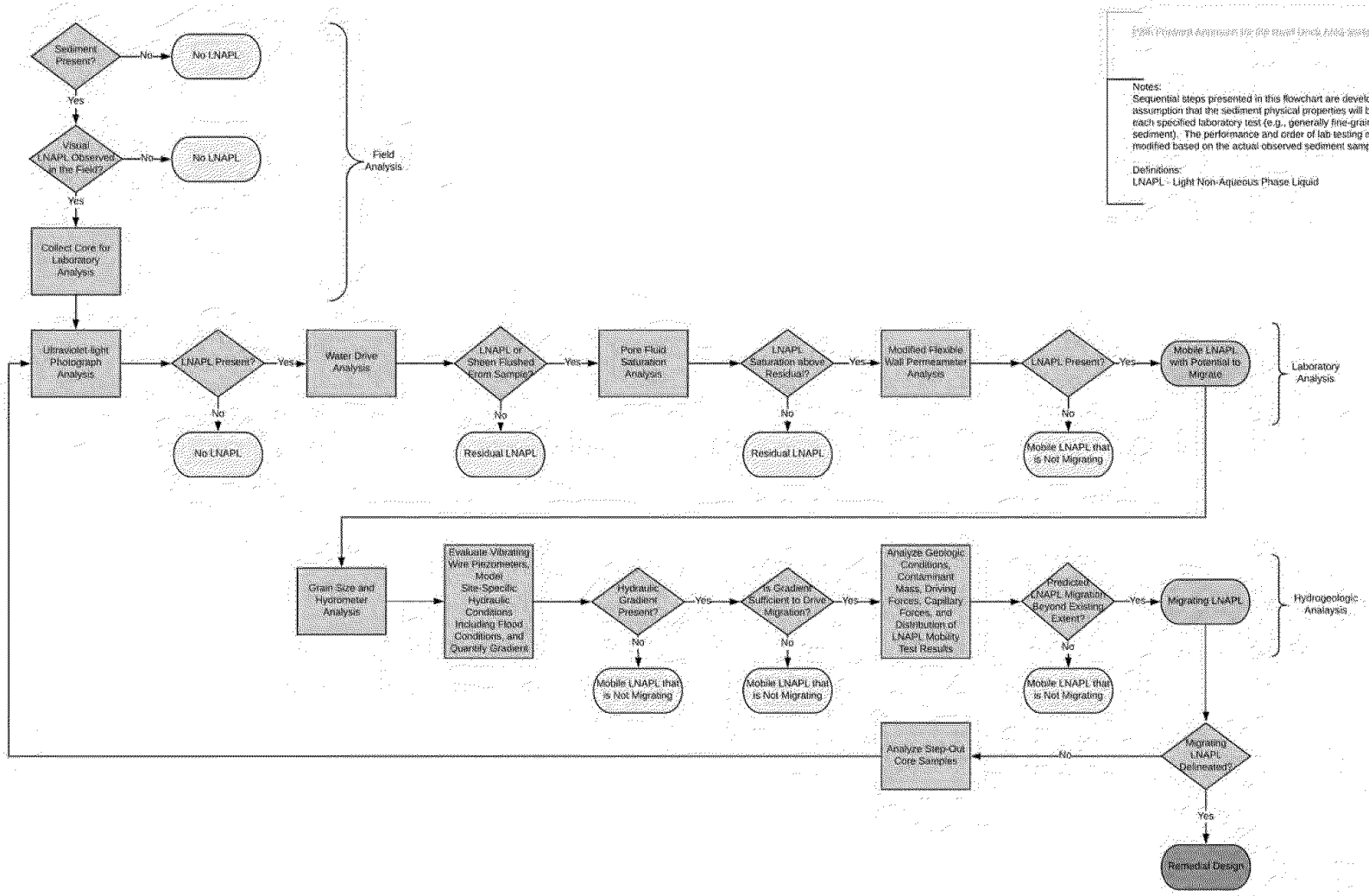
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SM&A

FIGURE 9


IDENTIFICATION OF TIER 3 REFERENCE LOCATIONS
PERIMETER GEOTECHNICAL EVALUATION AND SHORELINE COPC EVALUATION
GEOTECHNICAL EVALUATION FOR FEASIBILITY OF GAC AMENDED CAPPING
#3 LAGOON
#2 LAGOON
RSED-09
TEMPORARY VIBRATING WIRE PIEZOMETER FOR GROUNDWATER EVALUATION
NATURE AND EXTENT SEDIMENT SAMPLING
FORMER BORROW PIT
RSED-11
#1 LAGOON
SEDIMENT CORE SAMPLING FOR NATURE AND EXTENT, TCLP, AND LNAPL MOBILITY
MISSISSIPPI RIVER
LEASED TO NATIONAL MAINTENANCE AND REPAIR, INC.
TIER 3 EVALUATION OF TOXICITY, BIOLOGICAL INTEGRITY AND CO-LOCATED COPC
POND #3
POND #2
POND #1
Legend
Area for Step-Out Sampling
Area to Consider for Indicated Evaluation
River Dock Area Property Boundary
NOTES:
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2003 BY G.I. AERIAL SURVEY, INC. WITH THE FOLLOWING EXCEPTIONS: SITE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC.
2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY AND/OR FORMERLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. FEATURE LOCATIONS INCLUDING PIPELINES AND UTILITY LINES ARE APPROXIMATE. DATA COMPILED FROM HISTORIC DRAWINGS AND UPDATED USING BEST PROFESSIONAL JUDGEMENT BASED ON AVAILABLE INFORMATION. SOME OF THE PIPELINES AND OTHER FEATURES ASSOCIATED WITH THE FACILITY MAY BE INACTIVE, ABANDONED OR REMOVED.
350 175 0 350 700 Feet
DRAWN BY: KAK
CHECKED BY: DL
DATE: 1-11-16
SCALE: AS SHOWN
PROJECT NO.: 15-0355-SA
DATA GAPS TO ADDRESS
River Dock Area Sediment Path Forward
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
FIGURE 10

SR000375



GEI

LNAPL EVALUATION PROCEDURES
River Dock Area Sediment Path Forward
THE PREMCOR REFINING GROUP, INC.

Figure
11

Attachment 1

Correspondence between Premcor and Illinois EPA on the Path Forward Approach

Illinois EPA's Recommended Overall Approach to Closing the Sediments in the Ponds and Lagoons at the River Dock Area

Introduction

This document was prepared to describe Illinois EPA's recommended remedial approach to address the contaminated sediment at the lagoons (Lagoons #1, #2, and #3) and ponds (Ponds #1. #2, and #3) at the River Dock Area at the above-referenced facility. The recommended approach described herein was developed to meet the Illinois EPA's mission to protect human health and the environment that is consistent with Illinois laws and regulations, with consideration of: (1) the past, current and future conditions and land use at the Premcor River Dock Area; (2) incorporating the proposed action described in Section 1.0 of Premcor's Draft Path Forward Approach for the River Dock Area Sediments, dated January 2018 (formal comments to this document have yet to be provided to Premcor); and (3) utilization of the resources available to maximize the remedial action and to prevent future migration of the contaminants. Please note that this document only addresses Illinois EPA's recommended "overall" approach to bring the ponds and lagoons to closure. Illinois EPA requests that Premcor reviews this recommended over all approach, prior to Illinois EPA's full response to Premcor's afore-mentioned Draft Path Forward Approach document is made.

The following four key acronyms are used throughout the recommended approach for addressing the contaminated sediments in the lagoons and ponds at the River Dock Area:

TARPS:	Draft Tiered Approach for Evaluation and Remediation of Petroleum Products Releases to Sediment, by Illinois EPA (Updated May 4, 2009)
COPCs:	Contaminants of Potential Concerns
SSVs:	Sediment Screening Values
LNAPL:	Light Non-Aqueous Phase Liquid

Closure Requirements Applicable for Both Ponds and Lagoons

1. For all ponds and lagoons at the River Dock Area, Premcor must complete the delineation of extent and nature of the contamination in the sediments, based on the Tier 1 SSVs approved in Illinois EPA's June 30, 2015 letter or the Tier 2 SSVs developed in accordance with TARPS, if appropriate. (*Note that Premcor has proposed Tier 2 SSVs developed in accordance with TARPS and the alternative SSVs for the COPCs not included in TARPS, in its draft Path Forward Approach mentioned above, which is currently under Illinois EPA's review.*)

2. Not only must the nature and extent of contamination associated with the sediments be fully characterized for the tiered risk evaluation, but this information will also be needed when recording the institutional control to be placed for this parcel as part of the final closure requirements.

3. Premcor must provide appropriate corrective measure to ensure that any wastes/contaminates from the former landfill area, located west of Pond #3, will not migrate to any of the ponds or lagoons in the future. The basis for this requirement is that it appears though the west side of Pond #3 is in contact with the fill in the former landfill area.

4. For all Lagoons, and all Ponds that require closure activities under Item 6.b below, Premcor must implement a corrective measure monitoring program to demonstrate the corrective measures conducted adequately protect human health and the environment and control and/or minimize the contaminants' migration to groundwater or surface water. This corrective measure monitoring must include (but is not necessarily limited to) monitoring of: groundwater; surface water; ebullition; deposit and/or erosion of sediment; cap stability; and benthic biota establishment. If there is no detection of any COPCs above the pre-established baseline levels for three consecutive years during the corrective measure monitoring program, the monitoring elements and frequency can be reduced.

5. Alternative remedial plans must be developed and submitted to Illinois EPA for review and approval, which may include dredging and removal of the impacted sediment from the lagoons/ponds, if any of the investigation and/or evaluation determines that capping or any other remedial options included herein are not acceptable/applicable for the site-specific conditions.

Closure Requirements Applicable for Ponds Only

6. For three Ponds (Ponds #1, #2 and #3), if the COPCs are detected above the approved SSVs as determined in Item 1 above:

    a. Premcor may conduct Tier 2 or Tier 3 risk evaluation for the Ponds under TARPS as to those areas where the nature of the COPCs allows application of this tiered approach. According to Premcor, based on current site understanding, TARPs approaches may adequately address all three ponds (Pond #1 through #3).

    b. Premcor must conduct closure activities required for the Lagoons described in Items 7 through 12 below, for one or more Ponds, if:

        i. the risk-based approach described in Item 6(a) above fails to demonstrate absence of risk; or

        ii. the underlying contamination in the sediment contains <u>*any*</u> free-product (i.e. LNAPL) or is characteristically hazardous.

Closure Requirements for Lagoons

7. For the three Lagoons (Lagoons #1, #2, and #3), as they were utilized as a part of the former refinery's waste water treatment process, at a minimum, all three Lagoons and Ponds subject to these requirements pursuant to Item 6.b above must be capped with a

conventional subaqueous cap to properly close the units, provided that additional investigation data demonstrates that: (1) the establishment of a cap will not impact the conditions at the Lagoons or Ponds and all media surrounding the Lagoons or Ponds; and (2) the native clay-layer underlying (including the side walls) the Lagoons or Ponds is an acceptable base for protection of groundwater in the future. Additional requirements below must also be met for the three Lagoons, as applicable, and any Ponds subject to the Requirements pursuant to Item 6.b. above.

8. If any characteristically hazardous waste is present in the sediment, then:

    a. The hazardous portion of the sediment must be excavated prior to any further corrective measure being conducted; or

    b. The area impacted by characteristically hazardous material may remain in place if:

        i. it is limited and contained in nature;

        ii. it is not and will not be migrating vertically upward or downward or laterally; and

        iii. Premcor conducts closure activities to include engineered subaqueous capping with amendment (may include impermeable barrier and additional amended/conventional cap) and provide, at a minimum, a 30-year post-closure monitoring period, which may include (but is not necessarily limited to) the monitoring of groundwater, surface water, ebullition, deposit and/or erosion of sediment, benthic biota establishment, capping stability and any other parameters that determined necessary. If there is no detection of any COPCs above the pre-established baseline levels for three consecutive years during the post-closure monitoring program, the monitoring elements and frequency can be reduced.

9. If COPCs are present as LNAPL, then the type of free product (aka, LNAPL presence) should be further defined as:

    a. Residual LNAPL (immobile) – LNAPL that is present as a separate phase liquid but is at low saturation and thus is trapped within sediment pore space by capillary forces, and cannot migrate laterally or vertically under the conditions reasonably foreseen at the site.

    b. Mobile LNAPL: LNAPL that is present as a separate phase liquid, but lacking sufficient saturation or site conditions for lateral or vertical migration beyond the established extent under the conditions reasonably foreseen at the site.

    c. Migrating LNAPL: LNAPL at higher saturations than Mobile LNAPL which under conditions reasonably foreseen at the site may undergo lateral and/or vertical migration beyond the existing extent.

10. If the determination of the type of LNAPL in sediment in Item 9 above finds that LNAPL is Residual LNAPL (immobile), then an engineered remedy based on isolation and containment via sediment capping must be proposed for the entire affected Lagoon or Pond. Subaqueous capping with amended cap materials must be extended beyond the area affected by the LNAPL and extent of the COPCs, though not necessarily to cover the entire affected Lagoon or Pond, in conjunction with an appropriate monitoring program(s) to ensure the effectiveness of the capping.

11. If the determination of the type of LNAPL in sediment in Item 9 above finds that LNAPL is Mobile LNAPL but not migrating, an engineered remedy based on isolation and containment via sediment capping must be proposed for the entire affected Lagoon or Pond. Subaqueous capping with amended cap to cover the entire affected Lagoon or Pond must be proposed in conjunction with an appropriate monitoring program(s) to ensure the effectiveness of the capping.

12. If the determination of the type of LNAPL in sediment in Item 9 above finds that LNAPL is Migrating LNAPL, then:

    a. the extent and the rate of the Migrating LNAPL impact within the sediment and other media must be determined.

    b. Steps must be taken to ensure that "Migrating LNAPL" is no longer mobile and migrating;

    c. Premcor must propose effective remedial action to address the Migrating LNAPL:

        i. Premcor may propose an in-situ remedial action(s) in conjunction with or followed by an engineered capping; or

        ii. Premcor may propose, if approved by Illinois EPA, an engineered capping to include a layer designed to adsorb any LNAPL (such as organo-clay) with a monitoring plan to ensure that LNAPL is no longer mobile or migrating.

        iii. Premcor may propose a remedy(s) to remove/excavate the LNAPL prior to or in conjunction with any other remedial action is proposed.

FOR SETTLEMENT PURPOSES ONLY/
PRIVILEGED AND CONFIDENTIAL

GEI Consultants

Consulting Engineers and Scientists

April 5, 2018
Project 1800483-5.1

Ms. Takako Halteman
Illinois Environmental Protection Agency
Bureau of Land #33
1021 North Grand Avenue East
Springfield, Illinois 62702
[*via email*]

Dear Ms. Halteman:

Re: Response to "Illinois EPA's Recommended Overall Approach to Closing the Sediments in the Ponds and Lagoons at the River Dock Area"
Former Hartford Refinery Facility
Hartford, IL

GEI, on behalf of The Premcor Refining Group Inc. (Premcor), presents this letter in response to "Illinois EPA's Recommended Overall Approach to Closing the Sediments in the Ponds and Lagoons at the River Dock Area" received March 1, 2018 (Illinois EPA letter). That letter presents Illinois EPA's recommended remedial approach and closure requirements for the Ponds and Lagoons at the former Hartford Refinery Facility (Facility) based on the data presented in Premcor's draft "Path Forward Approach for the River Dock Area Sediments" dated February 2, 2018. This letter outlines an approach to address sediments based on, and largely incorporating, the Illinois EPA recommended approach. Premcor believes this approach meets the requirements and addresses Illinois EPA's concerns, as (1) noted in the Illinois EPA letter, (2) as expressed during the site visit conducted March 13, 2018, and (3) as noted during prior calls between Illinois EPA and Premcor.

1. Overall Approach

Due to continuing dialog with the Illinois EPA and internal deliberations, the approach to address remedial needs in the Ponds and Lagoons has evolved since the draft "Path Forward Approach for the River Dock Area Sediments" was submitted on February 2, 2018. The approach proposed in this letter is more conservative and therefore differs in some respects from the approach outlined in the Path Forward document. Premcor believes the proposed approach meets or obviates the necessity for additional nature and extent evaluations and for some of the closure requirements outlined in the Illinois EPA letter. The approach presented here is streamlined and focuses resources on identifying and implementing remedies without extensive and time-consuming investigations and while still maintaining protectiveness and compliance with Illinois closure requirements. Figure 1 presents a flowchart for Premcor's proposed approach.

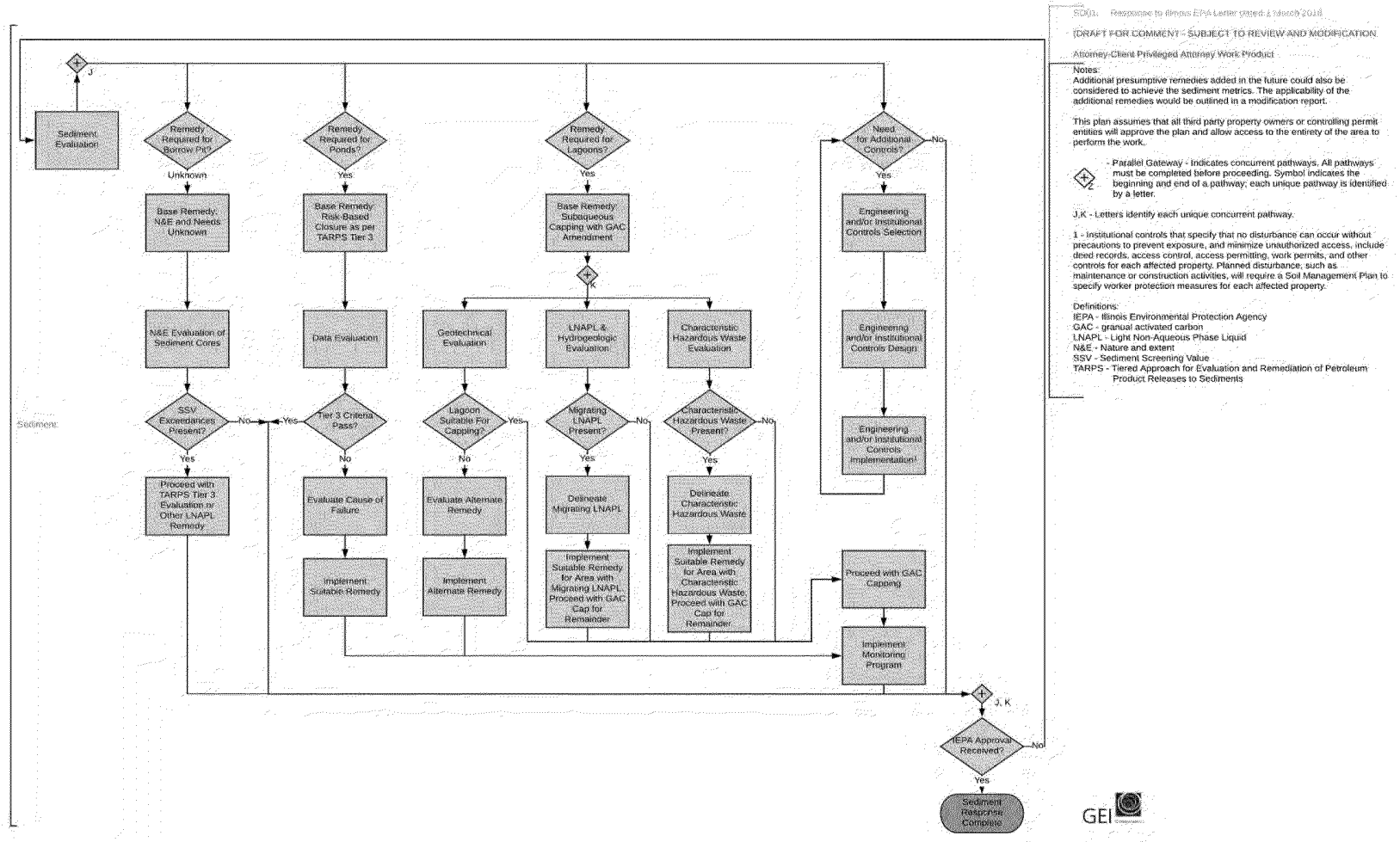
Figure 1 recognizes three areas needing closure: the Ponds, the Lagoons, and the Borrow Pit. In addition, the flowchart considers additional engineering and institutional controls.

- The Borrow Pit needs a nature and extent evaluation before any further decisions can be made.
- The Ponds, lacking evidence of constituents of potential concern (COPCs) from the Facility or any other sources, will be addressed via the *Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments, Draft, Update 4* (IEPA 2009, hereafter "TARPS") risk based process.
- The Lagoons, which have a history of use by the former facility operators as a receiver of waste water discharges, contains sediments which will be addressed by subaqueous capping using a Granular Activated Carbon (GAC) amended cap to address organic COPCs. The conservative use of a GAC amended cap to address sediments in all three lagoons is intended to be protective for all organic COPCs (including ebullition mediated migration, if any), and therefore will not require additional nature and extent investigation in the lagoons, except as specified subsequently herein. The exception is that if any migrating LNAPL or lead or benzene exceeding characteristic hazardous waste limits were to be identified in the sediment during proposed assessment and investigation, such areas of sediment would be further evaluated to determine if additional remedial measures might be needed (such as additional cap amendments, in-situ treatment, or removal).

The revised path forward approach presented here therefore envisions the following investigation needs:

- Sediment characterization borings to identify and define any COPCs in the Borrow Pit;
- Tier 3 TARPS toxicity, benthic community and surface sediment chemistry investigations in the Ponds (compared to Reference Location(s), to be identified);
- The Lagoons would be evaluated as follows:
  - Geotechnical testing of the sediment characteristics, native clayey soil characteristics, and occurrence of groundwater along the perimeter of the lagoons to determine suitability for capping, evaluation of sidewall integrity, and identification of the engineering requirements for a cap;
  - Focused investigation of the sediments near the former discharge point into the #1 and #2 Lagoons to identify any COPCs (benzene or lead) exceeding the limits for characteristic hazardous waste, and to delineate the extent if found; and
  - A focused investigation of fluid gradients and the sediments near the former discharge point into #1 and #2 Lagoons, to identify if any LNAPL present can be characterized as migrating LNAPL.

Figure 1 Proposed approach for closure of sediment in the River Dock Area



2. Closure Requirements: Ponds Only

Premcor proposes to proceed with Tier 2 and Tier 3 TARPS evaluation of the Ponds as recommended by the Illinois EPA. If the Tier 3 evaluation in the Ponds does not meet the standards, additional evaluation may be needed to ascertain the cause of such failure. Premcor does not propose conducting additional nature and extent investigation in the Ponds beyond collecting additional surface (0 – 0.5 foot) sediment samples co-located with biological sampling, and does not believe such additional investigation is warranted due to:

- There is no evidence of elevated COPCs in any prior sediment sample from the Ponds, and these were never used in the context of Facility operations; and
- The closed landfill area next to Pond #3, referenced in item (3) of the Illinois EPA letter, was formally closed in 1970, and inspection during the March 13, 2018 Illinois EPA field visit did not identify any concerns about migration to Pond #3 (i.e. no seeps, leachate, or other visual indications).

3. Closure Requirements: Lagoons Only

As detailed in various reports, the Lagoons received waste water from the former refinery owners/operators. Previous investigations have confirmed the presence of LNAPL and/or various COPCs in sediments in all three lagoons. Most of the COPCs and LNAPL have been identified in deeper sediment, indicating limited vertical migration over the four decades since the lagoons last received waste water discharge. Premcor maintains that the former investigation, which was based on the sampling program in the Agency-approved "Group 3 Soil Investigation Work Plan," provided data sufficient for a general evaluation of nature and extent of COPCs including LNAPL. As part of a path towards closure, and considering past use and the general nature and extent of LNAPL, capping of all three lagoons as requested in item (7) of the Illinois EPA letter is appropriate.

Existing data showed that elevated COPC concentrations and LNAPL indications in sediment were present near the former discharge point (represented by locations RSED-09 (#2 Lagoon) and RSED-11 (#1 Lagoon)), and concentrations declined or were absent in sediment further from the discharge point. If the LNAPL in the sediments near the former discharge point is not migrating, it is highly unlikely that LNAPL in sediments further away from the former discharge point would be migrating. An evaluation of the sampling data from RSED-09 and RSED-11 suggests that any LNAPL present is in deeper sediments, consistent with stable LNAPL bound to those fine-grained sediments (i.e. immobile) during deposition and most likely not migrating due to the presence of insufficient hydraulic forces.

Premcor therefore suggests eliminating the need for further specific nature and extent investigation of the sediments per item (1) in the Illinois EPA letter by implementing, as the base case, a GAC amended subaqueous cap across the lagoon sediments (i.e. the amended cap proposed under item (11) of the Illinois EPA letter). This approach addresses items (10) and (11) of the Illinois EPA letter. This proposed approach provides a protective remedy which streamlines the process and more efficiently uses resources.

It is currently not clear if the LNAPL identified in the sediment near the former discharge point would qualify as immobile, mobile, or migrating per the definitions in item (9) of the Illinois EPA

letter. If LNAPL within the sediment was found to be migrating, and therefore potentially not adequately addressed by the proposed GAC amended cap, then additional assessment per the outline in item (12) of the Illinois EPA letter would be indicated.

To determine if any LNAPL migration is occurring, Premcor proposes the following:

- A focused investigation of the sediments near the former discharge point into #1 and #2 Lagoons (i.e. RSED-09 and RSED-11) to identify if any LNAPL present can be characterized as potentially migrating LNAPL.
- The LNAPL assessment results will be supplemented by the groundwater movement evaluation conducted as part of the geotechnical investigation into the feasibility and design of the cap. Fluid gradients of sufficient magnitude are necessary for any migration of LNAPL to occur. Forces of insufficient magnitude to drive migration of any mobile LNAPL, if present, would suggest that migrating LNAPL in the sediments is in fact absent.
- If the LNAPL and hydrogeologic assessments indicate that migrating LNAPL is absent, then the GAC amended cap is likely sufficient, pending geotechnical evaluation results.
- If the LNAPL and hydrogeologic assessments indicate that migrating LNAPL is present, the extent will be delineated and the adequacy of the baseline GAC cap or other corrective measures will be considered in terms of item (12) of the Illinois EPA letter.

Item (8) of the Illinois EPA letter notes requirements if any COPCs in sediments exceed the characteristic hazardous waste limits were to be identified. Premcor recognizes that in the area nearest to the former discharge point there are elevated concentrations of lead and benzene (RSED-09 and RSED-11). Premcor proposes to investigate whether sediments at and around RSED-09 and RSED-11 exceed the Toxicity Characteristic Leaching Procedure (TCLP) limits for benzene and lead via step-out sediment coring and laboratory analysis. If the sediment contains benzene and/or lead exceeding the characteristic hazardous waste limits, the recommendations in item (8) of the Illinois EPA letter will be considered.

4. Other Requirements

Item (4) of the Illinois EPA letter calls for a monitoring program for any water body requiring engineered remediation. A post-remediation program will be proposed as part of the remedial design. This program will include the determination of baseline conditions and annual monitoring for 3 years, after which frequency may be reduced. We note that for some media (e.g. surface water), identifying the appropriate baseline conditions may be challenging and warrants further discussion.

The geotechnical investigation of the lagoons includes sediment characterization, perimeter soil characterization, sediment shear strength evaluation, determination of groundwater vertical and lateral gradients, and cap consolidation evaluation. This information, together with an understanding of the nature of the contaminants in the sediments, will allow determination of the feasibility and appropriate design for a subaqueous GAC amended cap. If this investigation determines that there are areas of sediment where capping will be not acceptable or applicable, then alternative remedial plans would be developed for these areas, in accordance with item (5) of the Illinois EPA letter.

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Case Number 2003CH000459
Transaction ID: 62060163
Date: May 23 2018 10:58AM
Mark Von Nida
Clerk of Circuit Court
Third Judicial Circuit, Madison County Illinois

4. Spatial Redundancy Analysis

Spatial redundancy analyses were conducted using VSP to identify statistical redundancy in the number and placement of sampling points for benzene, arsenic, lead, and MTBE. These analytes were selected for analysis based on the results from the COC reduction analysis. Results of the analysis indicated that for individual COCs, certain wells could be removed, but in the aggregate, confirmed the lateral spatial optimization of the current well monitoring network. However, the Main Deep and Basal zone wells, which have been shown to have COC concentrations consistently below analytical detection limits or below their respective Class I GROs, may be removed from the monitoring network.

5. Conclusions

The current groundwater monitoring and gauging program could be streamlined for routine gauging and monitoring to focus on higher priority COCs. The optimized network was determined through a statistical optimization of the complete analyte list to identify COCs which would be of highest priority in the routine monitoring based on their similarity to co-occurring COCs with similar trends and their frequency of concentrations exceeding the Class I GROs. Overall, the temporal and spatial redundancy analyses largely confirmed the current monitoring well network for lateral characterization purposes. The optimization analyses, however, support implementation of a more focused analyte list and a reduced frequency of sampling events.

Based on the analyses presented herein, the following findings could be used to inform the optimized routine monitoring program:

- Twenty-six (26) COCs were identified as having concentrations greater than their respective Class I GROs in the last 3 years (Table 1);
- Four (4) priority COCs (benzene, arsenic, lead, and MTBE), were found to have concentrations above their respective Class I GROs at a frequency above a *de minimis* threshold (>2%);
- Main Deep and Basal wells have had COC concentrations consistently below analytical detection limits or below their respective Class I GROs, and could be considered for removal from the routine monitoring program;
- The results from the temporal redundancy analysis support a reduction in sampling frequency for the four (4) high priority COCs, and confirmed the appropriateness of semiannual groundwater gauging frequency; and
- The spatial redundancy analysis confirmed the appropriateness of the lateral spatial distribution of the shallow monitoring well network.

6. References

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[USPEA] United States Environmental Protection Agency. 2002. Guidance on Choosing a Sampling Design for Environmental Data Collection for Use in Developing a Quality Assurance Project Plan. EPA QA/G-4. EPA Office of Environmental Information. EPA/600/R-96/055.

Attachment 1

Analyte Correlation Table

ATTACHMENT 1 - Analyte Correlations

Summary
This report summarizes the post-sampling correlation analysis of analytes and methods used.

The following table summarizes the correlations of interest as determined by the VSP user.Some pairs of analytes were filtered out based on the following criteria:

- Only pairs with a Kendall's tau-b correlation that has an absolute value significantly greater than 0.50 were kept by the VSP user.

Analyte	Analyte	N	Unpaired Samples	p-value	Kendall's tau-b	confidence	p-value
Benzene	Ethylbenzene	2112	(6,0)	N/A	0.522	(0.505,0.540)	0.000
Benzene	Total Xylenes	2112	(6,0)	N/A	0.648	(0.627,0.669)	0.000
Ethylbenzene	Total Xylenes	2112	(0,0)	N/A	0.654	(0.636,0.673)	0.000
Ethylbenzene	Toluene	2112	(0,0)	N/A	0.613	(0.597,0.628)	0.000
Toluene	Total Xylenes	2112	(0,0)	N/A	0.602	(0.585,0.618)	0.000
Chloroform	Tetrachloroethene	1366	(0,0)	N/A	0.575	(0.571,0.579)	0.000
Fluorene	Phenanthrene	1361	(0,0)	N/A	0.723	(0.697,0.750)	0.000
Benzo(a)anthracene	Chrysene	1361	(0,0)	N/A	0.693	(0.684,0.701)	0.000
Benzo(a)anthracene	Benzo(b)fluoranthene	1361	(0,0)	N/A	0.573	(0.567,0.580)	0.000
Fluoranthene	Pyrene	1361	(0,0)	N/A	0.556	(0.541,0.570)	0.000
Benzo(b)fluoranthene	Chrysene	1361	(0,0)	N/A	0.596	(0.590,0.603)	0.000
Benzo(b)fluoranthene	Benzo(k)fluoranthene	1361	(0,0)	N/A	0.776	(0.771,0.781)	0.000
Anthracene	Phenanthrene	1361	(0,0)	N/A	0.622	(0.600,0.645)	0.000
Anthracene	Fluorene	1361	(0,0)	N/A	0.615	(0.592,0.637)	0.000
Anthracene	Pyrene	1361	(0,0)	N/A	0.520	(0.503,0.537)	0.000
Acenaphthene	Phenanthrene	1360	(0,1)	N/A	0.652	(0.627,0.678)	0.000
Acenaphthene	Naphthalene	1360	(0,0)	N/A	0.612	(0.586,0.637)	0.000
Acenaphthene	Fluorene	1360	(0,1)	N/A	0.758	(0.731,0.786)	0.000
Acenaphthene	Anthracene	1360	(0,1)	N/A	0.530	(0.509,0.551)	0.000
Naphthalene	Phenanthrene	1360	(0,1)	N/A	0.545	(0.521,0.570)	0.000
Fluorene	Naphthalene	1360	(1,0)	N/A	0.545	(0.520,0.569)	0.000
Benzo(a)anthracene	Benzo(a)pyrene	1360	(1,0)	N/A	0.521	(0.515,0.528)	0.000
Benzo(a)pyrene	Chrysene	1360	(0,1)	N/A	0.543	(0.536,0.549)	0.000
Benzo(a)pyrene	Benzo(b)fluoranthene	1360	(0,1)	N/A	0.723	(0.717,0.728)	0.000
Acenaphthene	Benzene	1354	(6,764)	N/A	0.533	(0.508,0.557)	0.000
Naphthalene	Total Xylenes	1354	(6,758)	N/A	0.601	(0.575,0.626)	0.000
Benzene	Naphthalene	1354	(764,6)	N/A	0.632	(0.606,0.658)	0.000
Ethylbenzene	Naphthalene	1354	(758,6)	N/A	0.529	(0.506,0.551)	0.000
Benzene	Phenol	1353	(765,6)	N/A	0.541	(0.518,0.564)	0.000

Primary Objective
The primary purpose of this correlation analysis is to determine which analytes, if any, are highly correlated with one another. Considerable cost savings could be realized if the number of analytes could be reduced without affecting the ability to confidently detect trends and achieve groundwater remediation goals. The information in this report should be reviewed to determine which analytes are highly correlated. Analytes which are highly correlated with other analytes are candidates to no longer be measured or have their frequency of measurements reduced.

Methods
Correlations used include Pearson's r, Spearman's rho, and Kendall's tau-b. In addition to computing each correlation coefficient, a p-value is included from the statistical test which determines if each

correlation coefficient is statistically different from zero. Also included for each correlation is an approximate 95%confidence interval.

Pearson's r
Pearsons r is a common correlation which measures the linear relationship between two variables. Values are between -1 and 1, with 0 indicating no linear relationship, -1 indicating a high negative association (as one variable increases, the other decreases), and 1 indicating a high positive association (as one variable increases, the other increases). Pearson's r is calculated when none of the data values are non-detects.

Pearson's r is calculated such that if you have two variables X and Y, and n samples,

$$r = \frac{\sum_{i=1}^{n}(X_i - \overline{X})(Y_i - \overline{Y})/(n-1)}{s_X s_Y}$$

where s_x and s_y are the sample standard deviations (Ramsey, 2002).

Where the assumed hypothesis H_0 is that the analytes have no linear relationship (a correlation of 0), the test statistic for determining the significance level of a pair of analytes is $T = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$ which has a t distribution with n-2 degrees of freedom (Devore, 1991).

An approximate 95%confidence interval is calculated by applying Fisher's Z distribution (Fisher, 1970). The process using Fisher's Z distribution for a correlation confidence interval is as follows:

(1) Transform Pearsons r to z by applying the equation $z = 0.5[\ln(1 + r) - \ln(1 - 4)]$.

(2) Calculate it's standard error $\sigma_z = \frac{1}{\sqrt{n-3}}$.

(3) Compute a 95%confidence interval using $z \pm z_{\frac{\alpha}{2}} \sigma_z$ where $z_{\frac{\alpha}{2}}$ is the standard normal distribution for the specified confidence interval.

(4) Use a statistical z distribution to find the cumulative probability values *a* and *b* that correspond to the lower and upper confidence limits of the two values produced.

(5) The approximate 95%confidence interval is (2*a* - 1, 2*b* - 1).

Spearman's rho
Spearman's rho is a non-parametric correlation which measures the linear relationship of the ranks of two variables. Values are between -1 and 1. Spearman's rho is calculated when none of the data values are non-detects, or when there is a single non-detect level, and none of the detects are below this non-detect value.

Spearman's rho is computed by first computing the ranks of each analyte value when compared to other values for that analyte (averaging ranks if there are ties). For instance, if an analyte has seven values (15, 25, 30, 15, 60, 100, 10), the ranks would be (2.5, 4, 5, 2.5, 6, 7, 1). Then compute the correlation, test statistic, and confidence on these ranks using the methods for Pearson's r.

Kendall's tau-b
Kendalls tau-b is a non-parametric correlation with values between -1 and 1. A distinct advantage of Kendall's tau-b is that it accounts for multiple non-detect levels, and accounts for cases where detects are

below some non-detect values (Helsel, 2004). The methodology was originally developed by Kendall (1955) and adapted for non-detects by Brown, Hollander, and Korwar (1974). Helsel (2004) explains the process of computing Kendall's tau-b. First, the number of concordant pairs (N_c) and disconcordant pairs (N_d) are computed by sorting the data by variable X and comparing each Y observation to each subsequent Y observation. Each time a subsequent observation is an increase from the value it is being compared to, this is a concordant pair. Each time a subsequent observation is a decrease, this is a disconcordant pair. Subsequent observations where either X or Y do not change, or where the change is indeterminent due to non-detects are considered ties. The equation for Kendall's tau-b as shown in Helsel (2004) is

$$\tau_b = \frac{N_c - N_d}{\sqrt{\left(\frac{N(N-1)}{2} - \#ties_X\right)\left(\frac{N(N-1)}{2} - \#ties_Y\right)}}$$

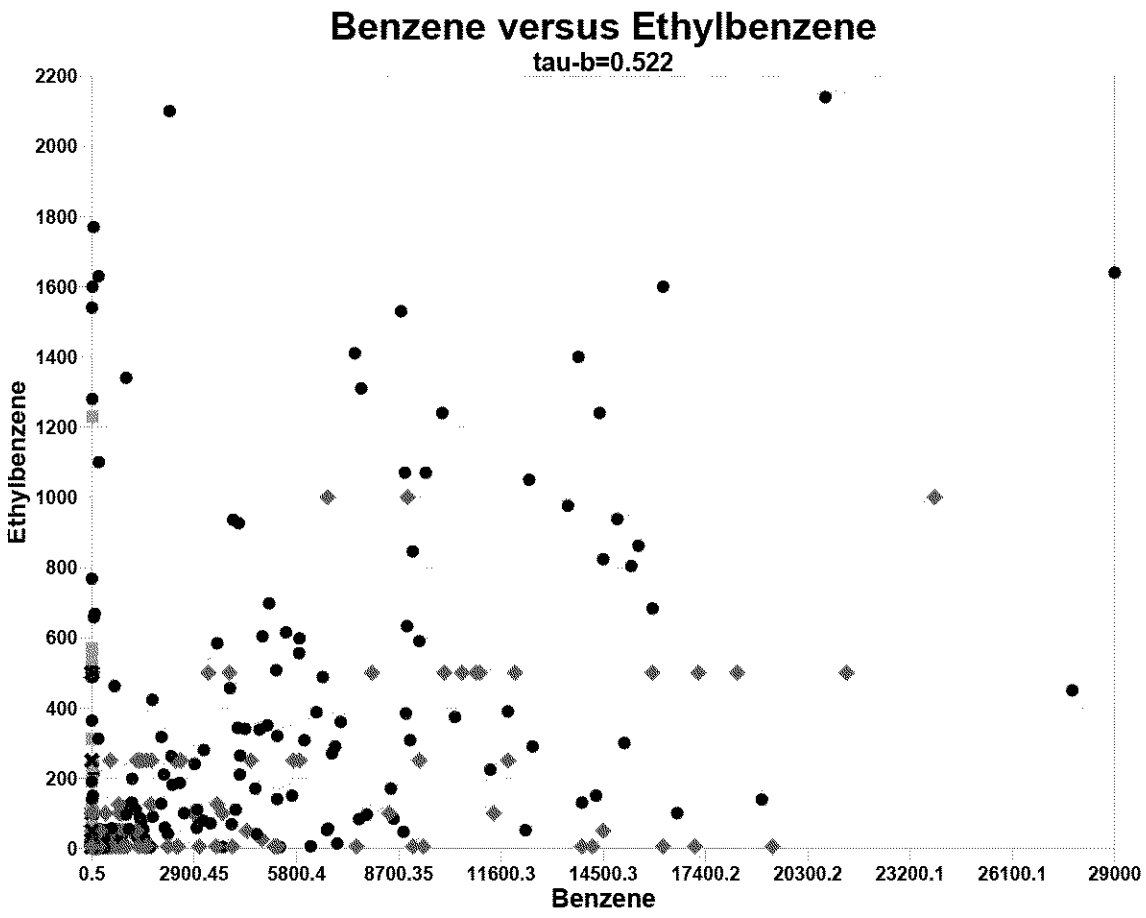
Analyte Graphs

Analyte graphs selected by the VSP user are provided in the section below. The pair of analytes used for a specific graph are shown in the first line of the title, i.e., "X versus Y". The second line of the title displays the values of Pearson's r, Spearman's rho, and Kendall's tau-b calculated for the pair of analytes. If a correlation could not be calculated due to the nature of its non-detect levels, it is not shown. Points on the graph that refer to non-detects are labeled as follows:

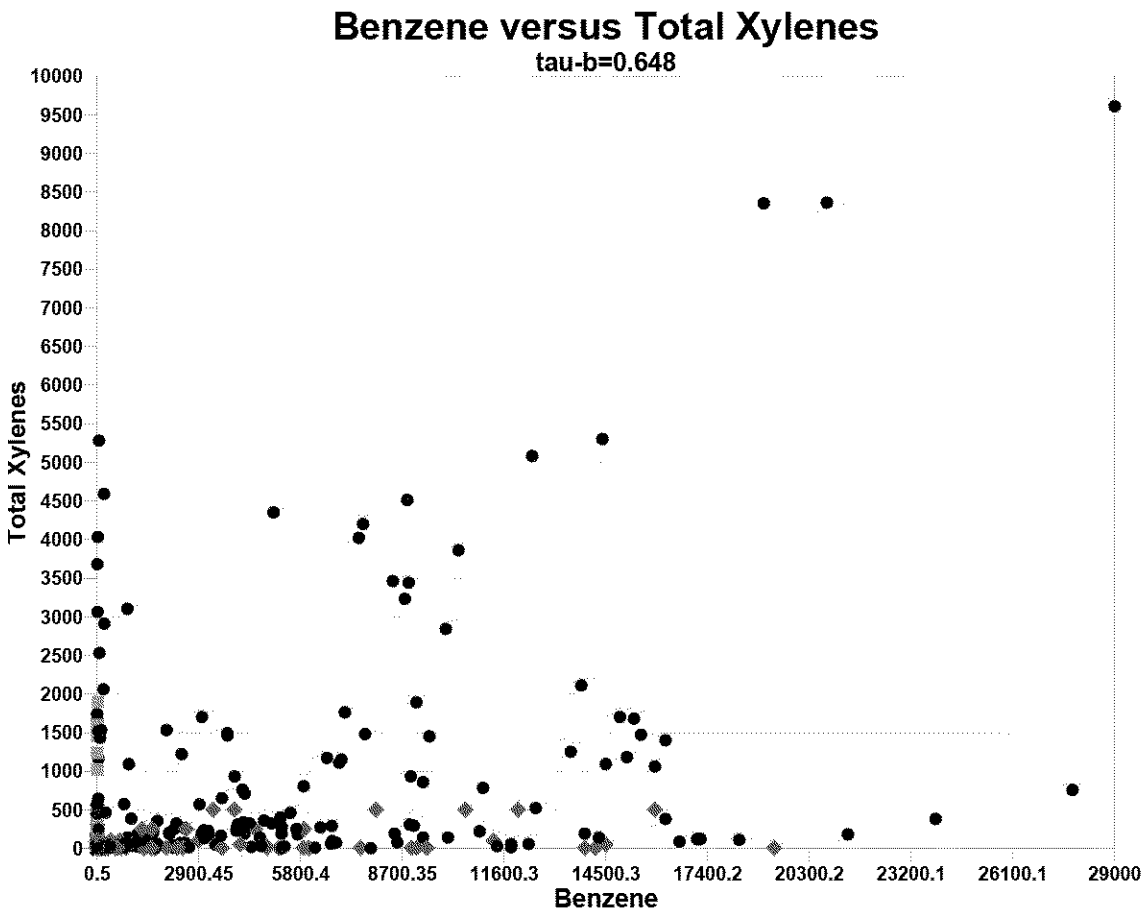
- **Both detects**
- **Both non-detect**
- **X non-detect**
- **Y non-detect**

X non-detect and Y non-detect refer to the analytes on the X and Y axis respectively.

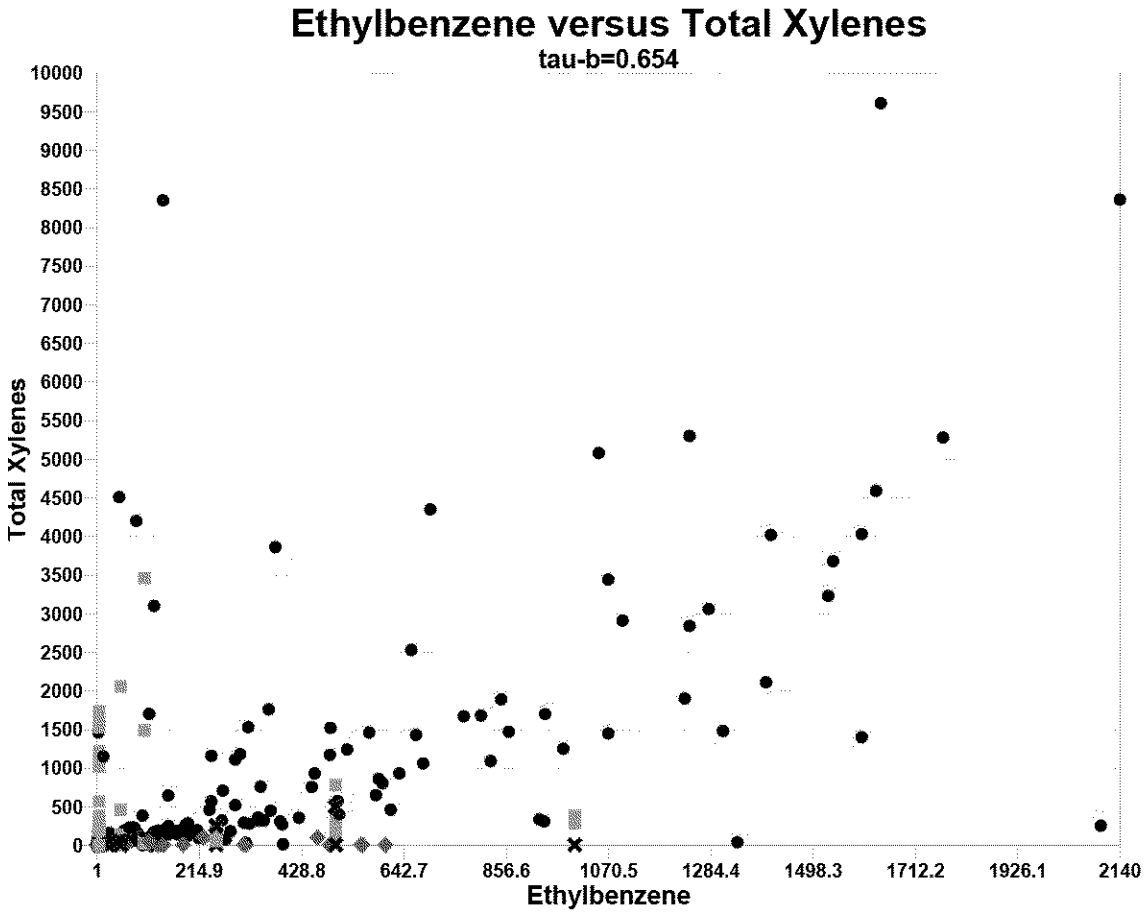
ATTACHMENT 1 - Analyte Correlations



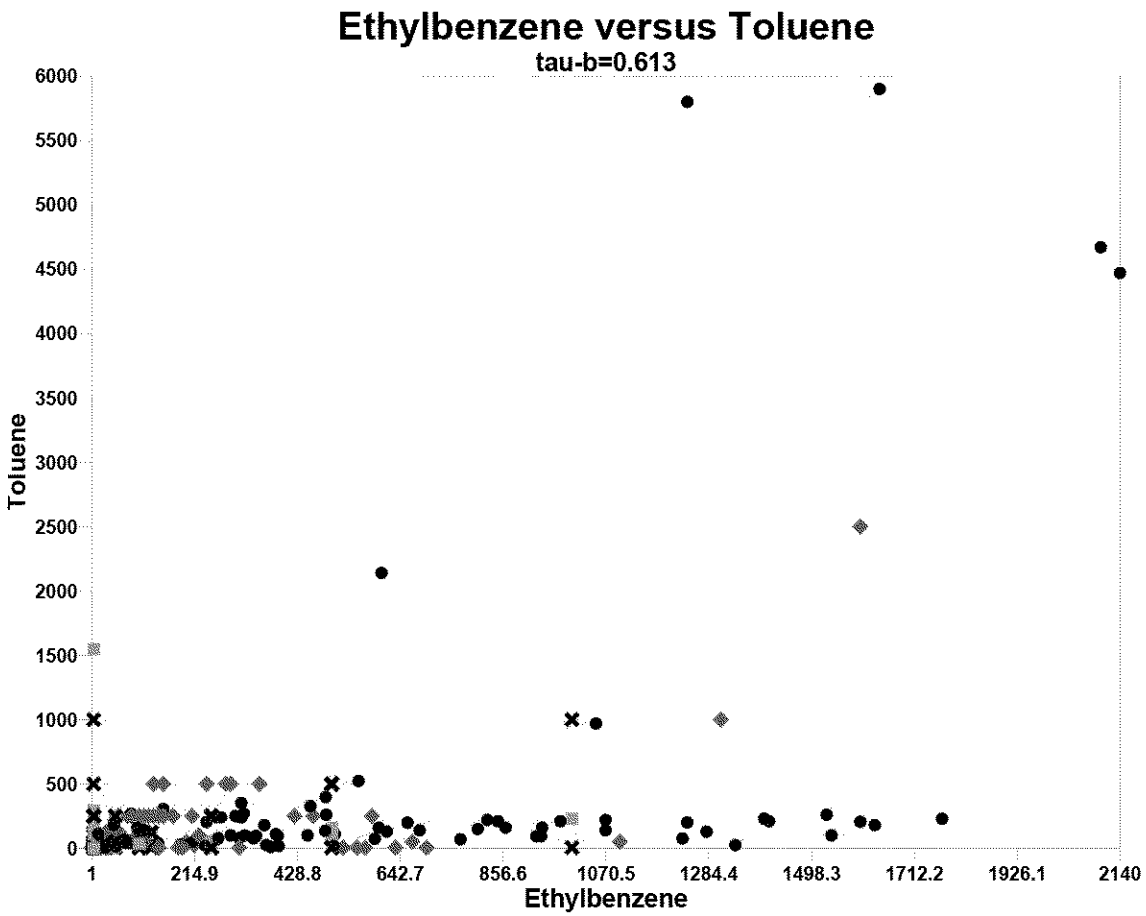
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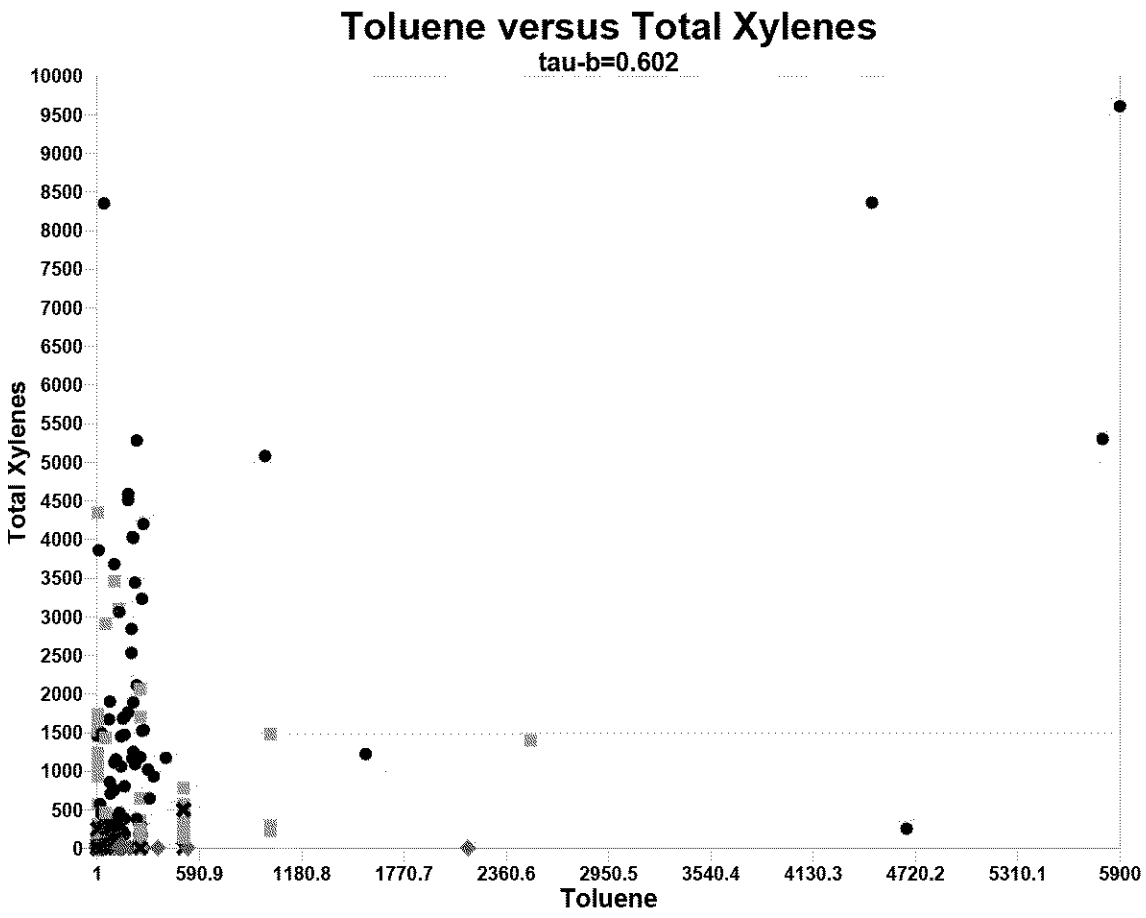
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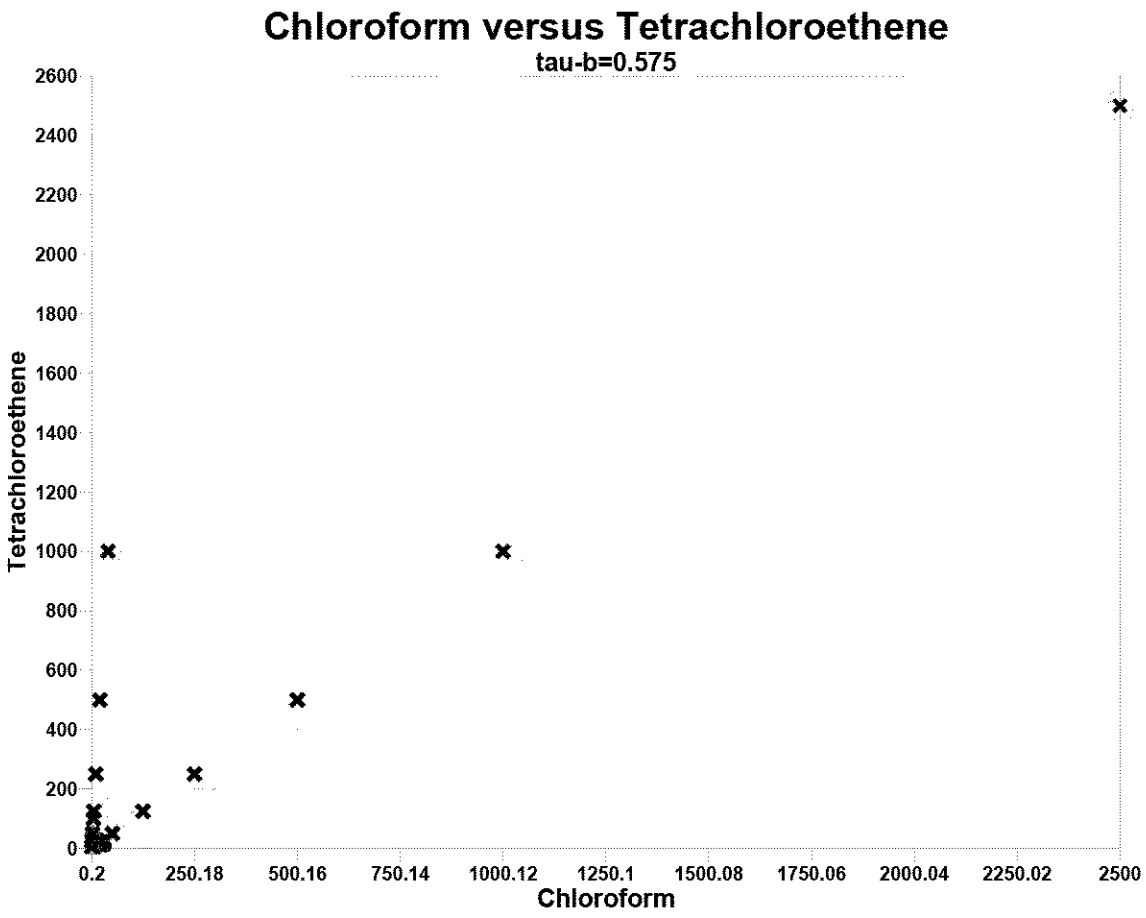
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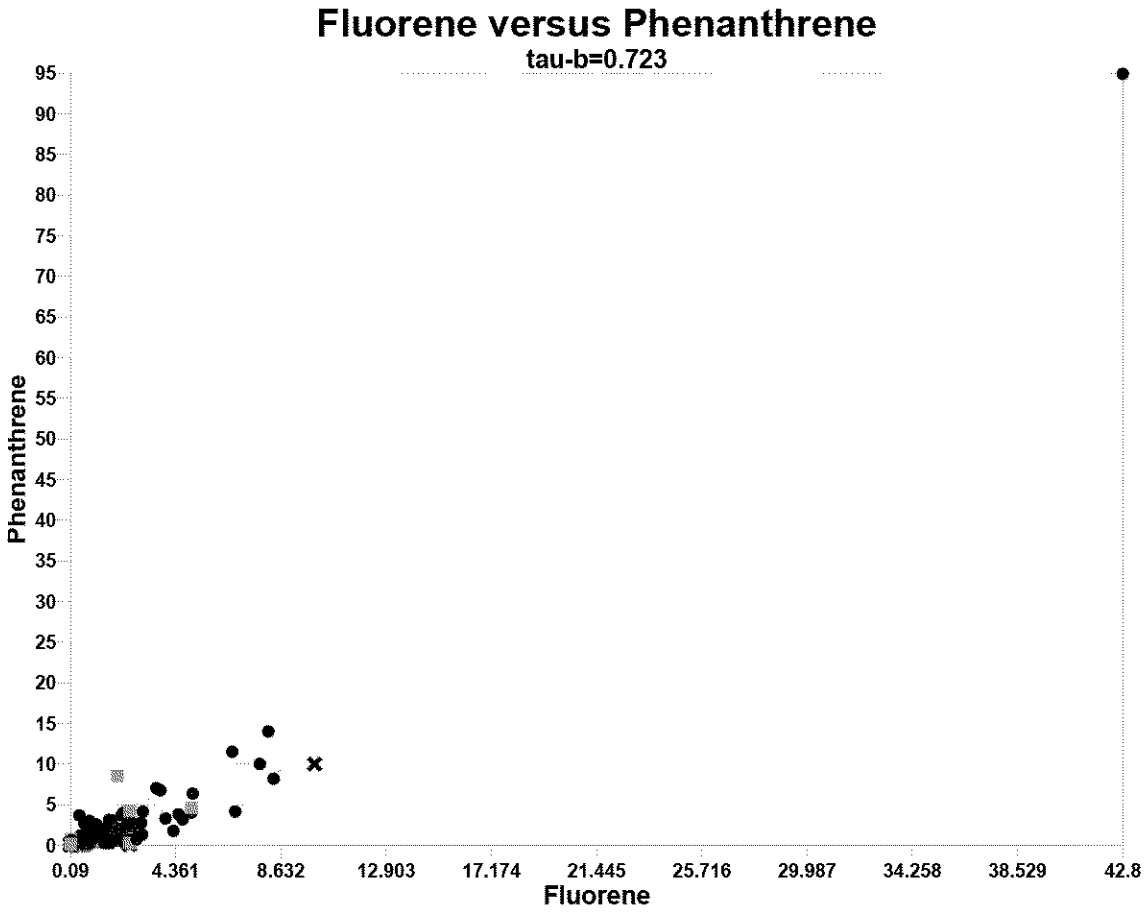
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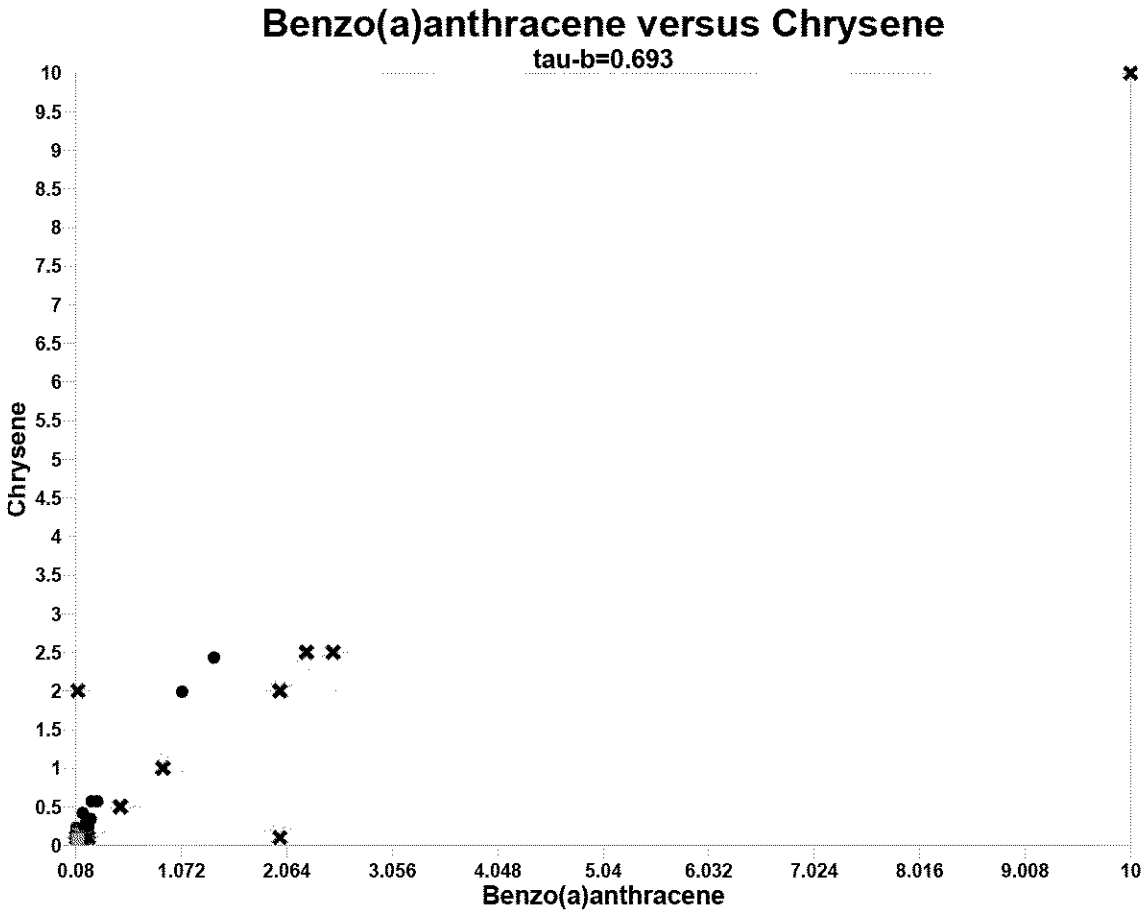
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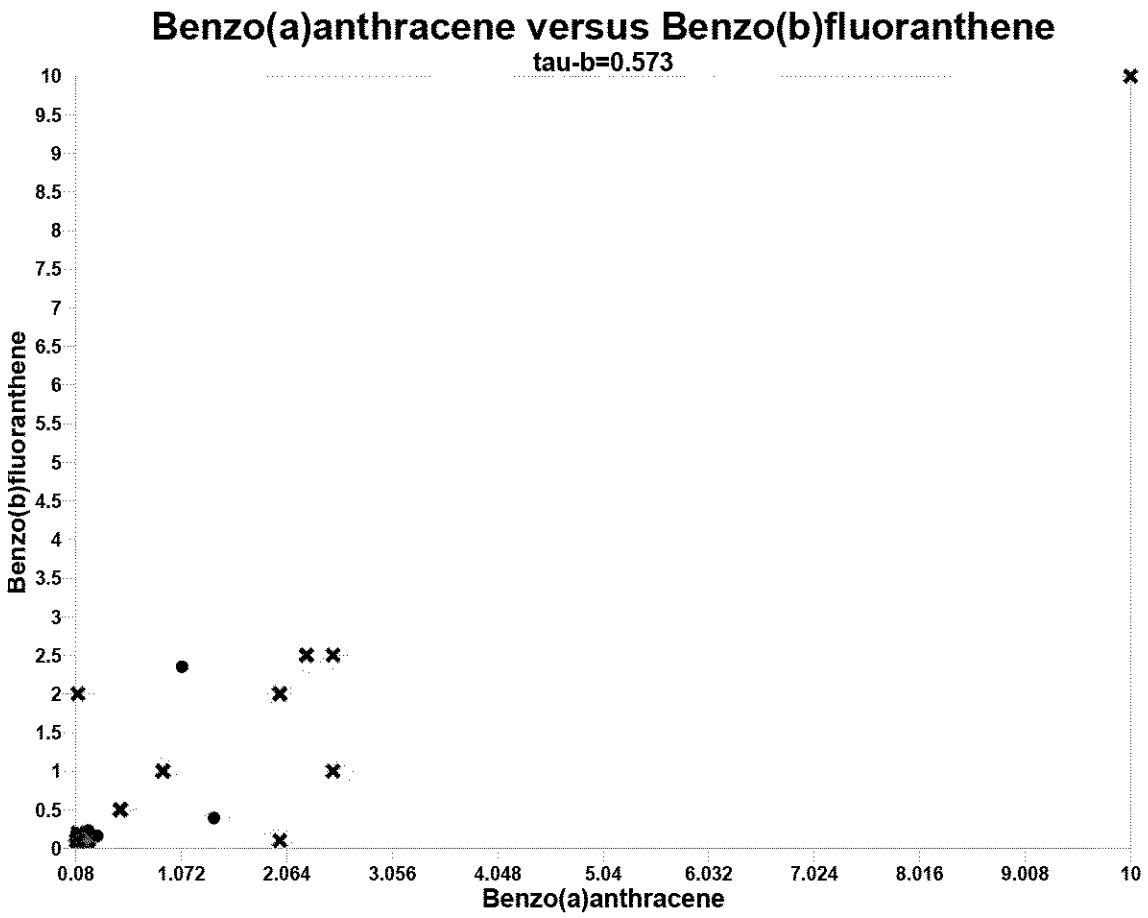
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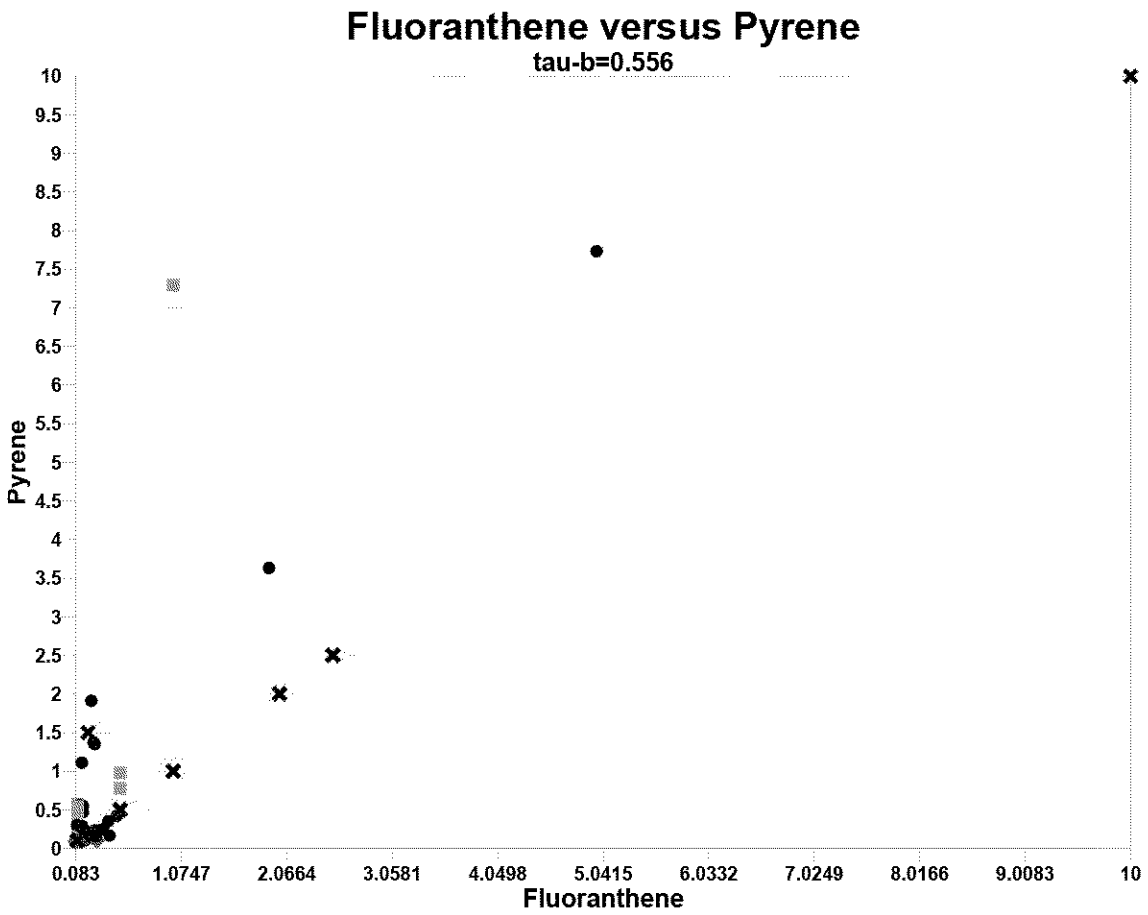
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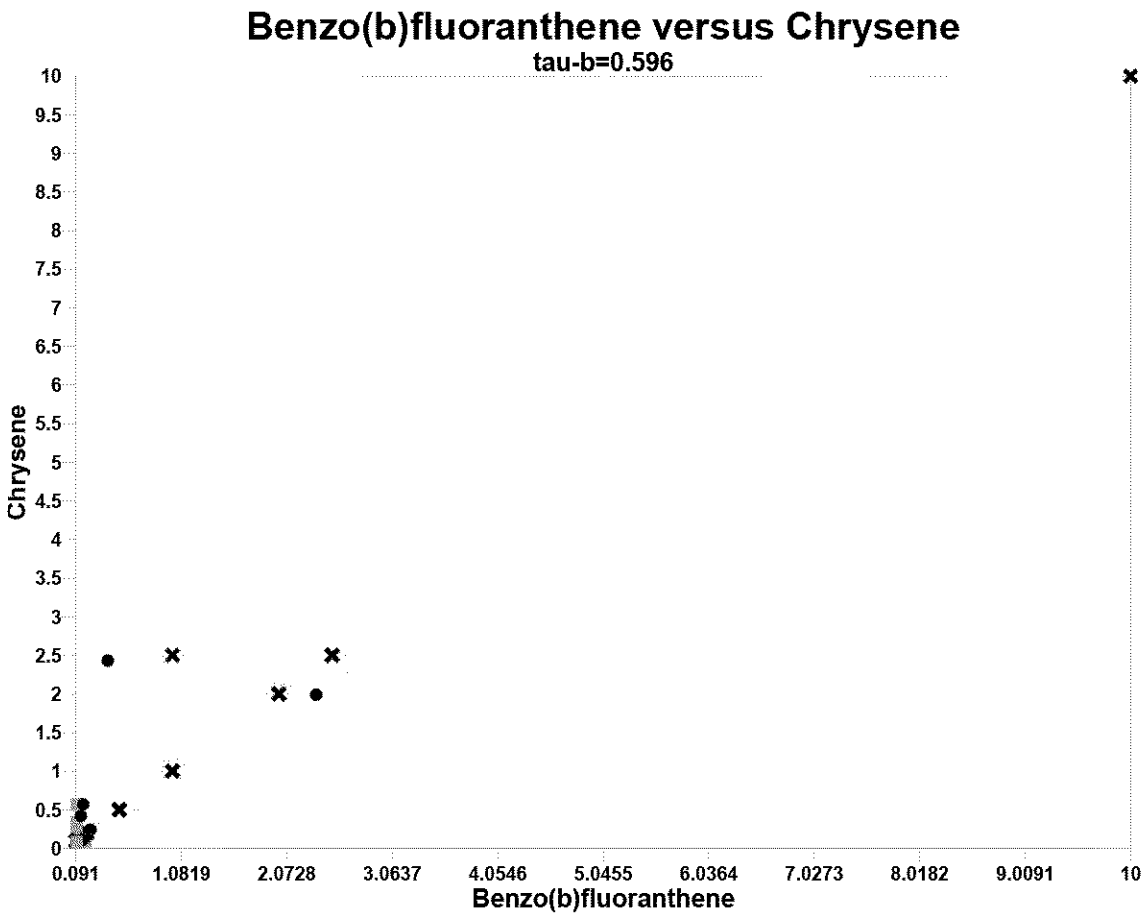
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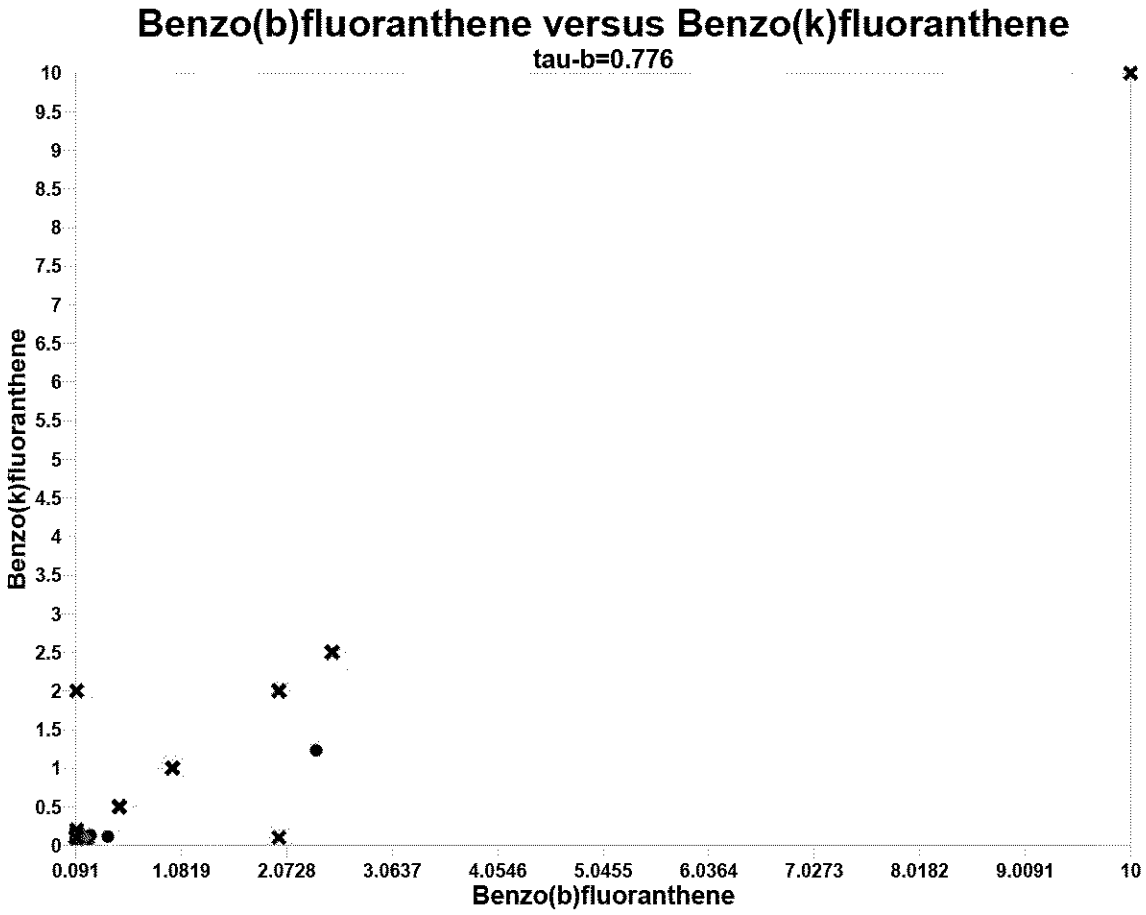
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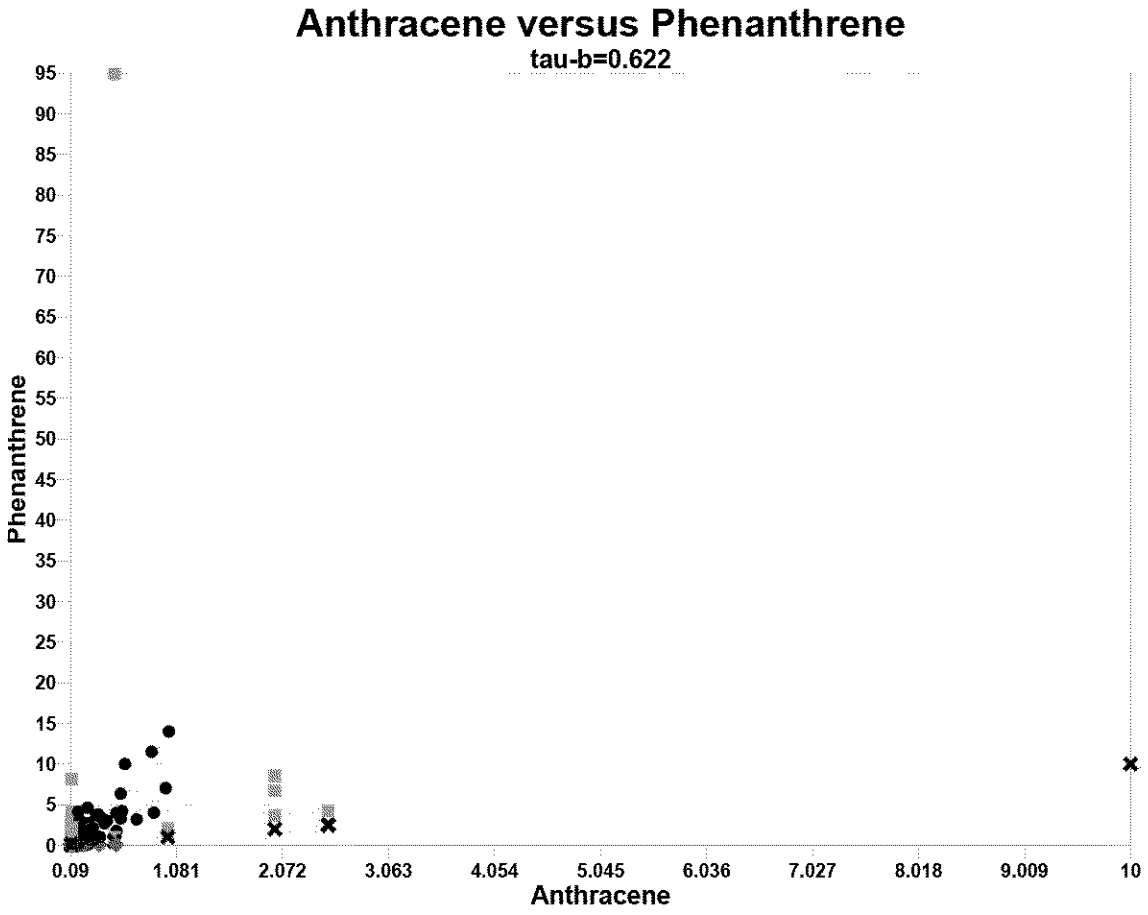
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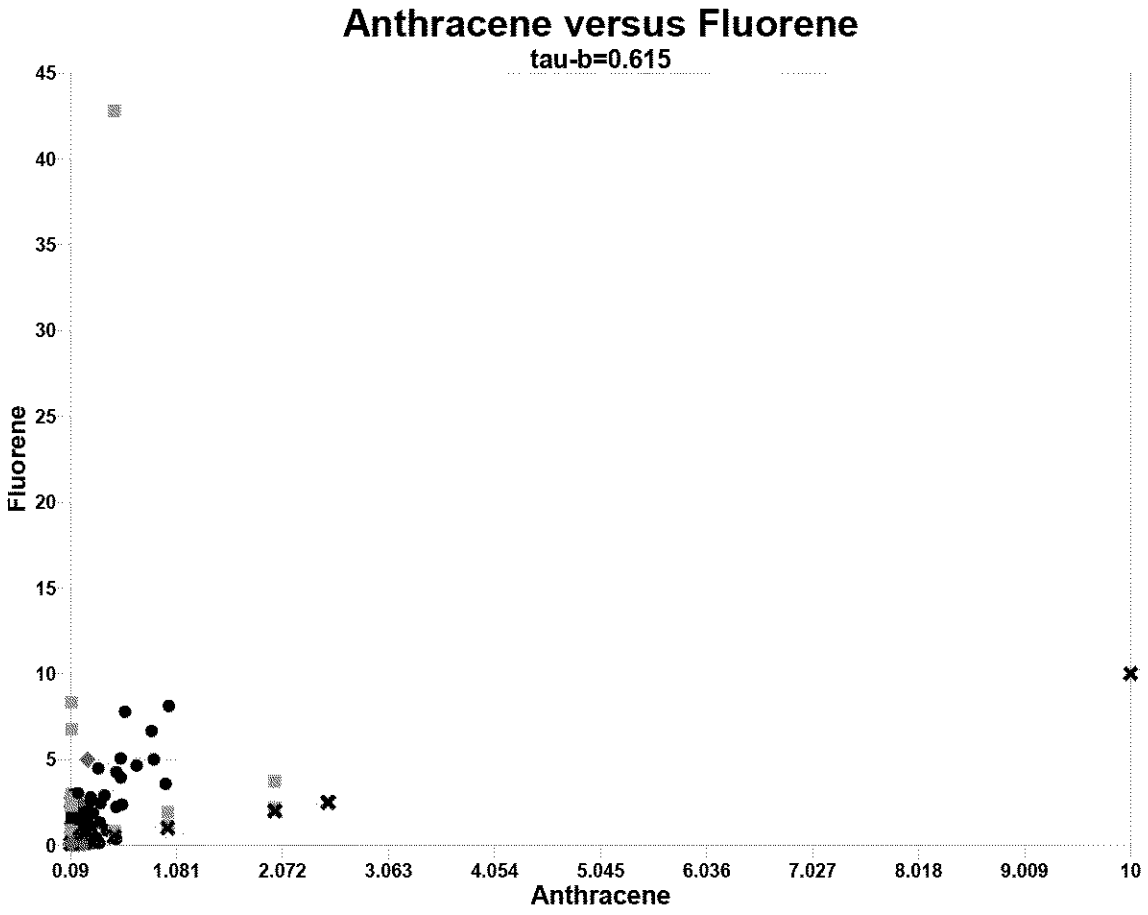
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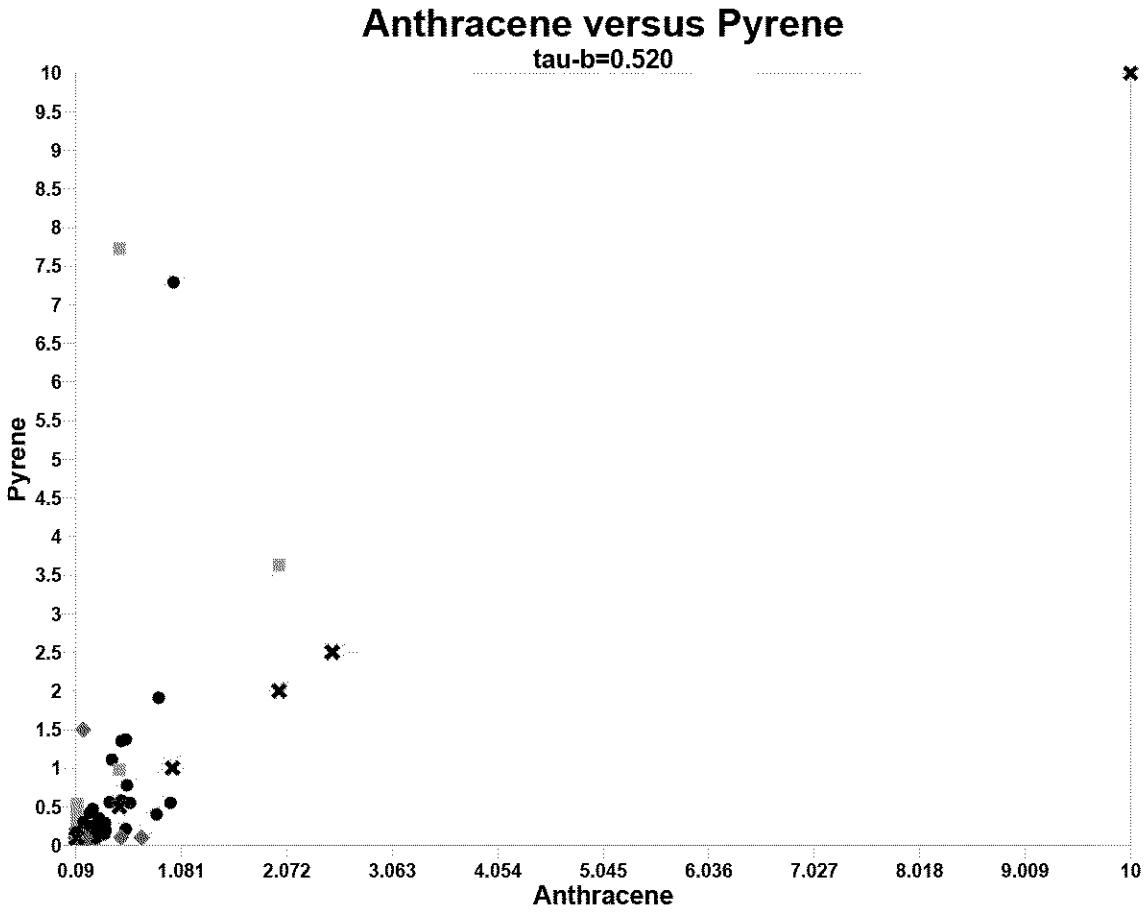
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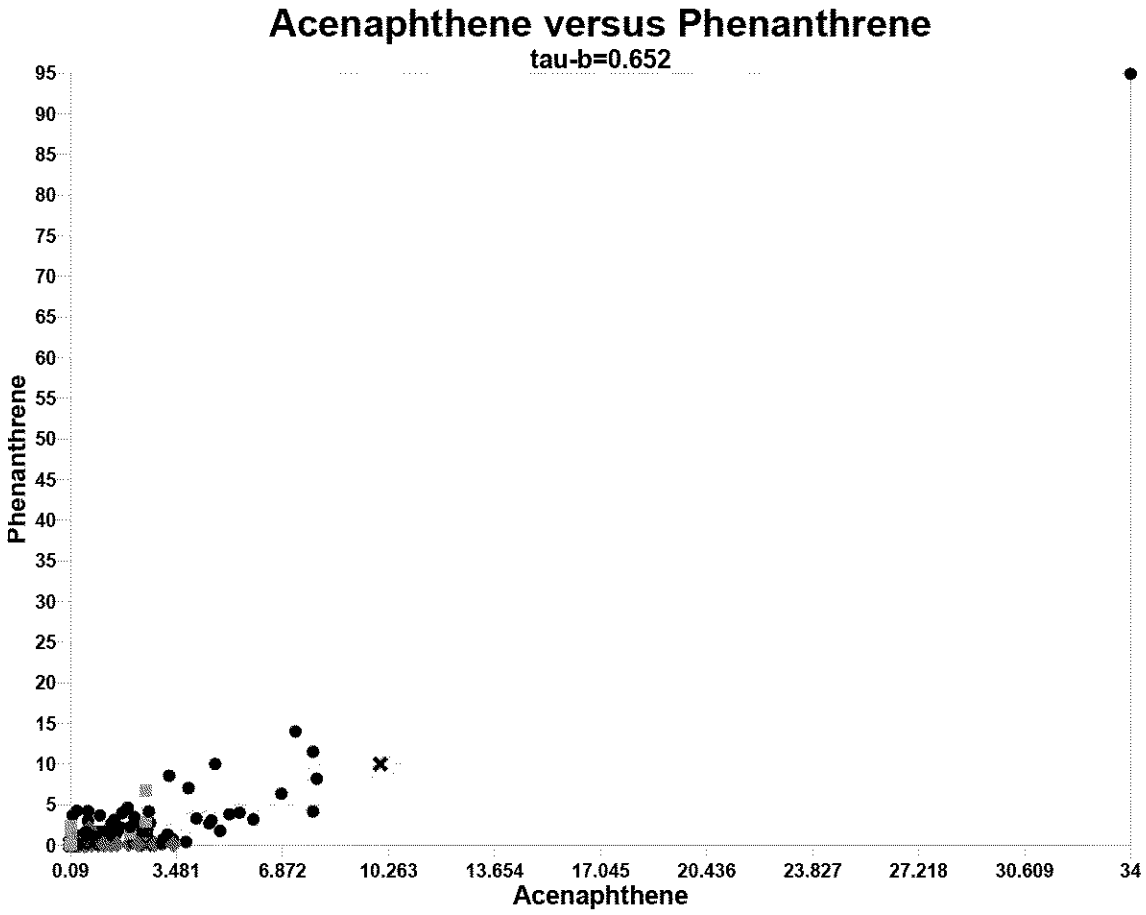
ATTACHMENT 1 - Analyte Correlations



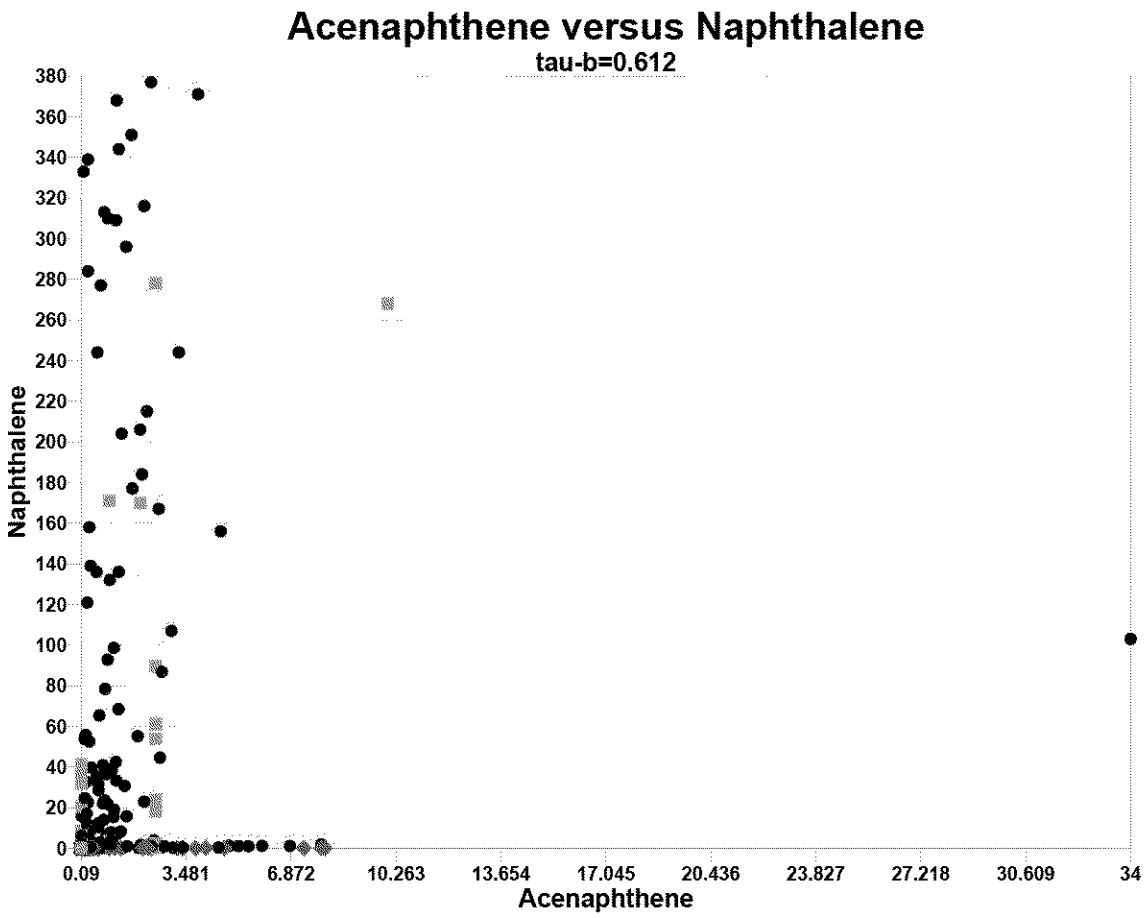
ATTACHMENT 1 - Analyte Correlations



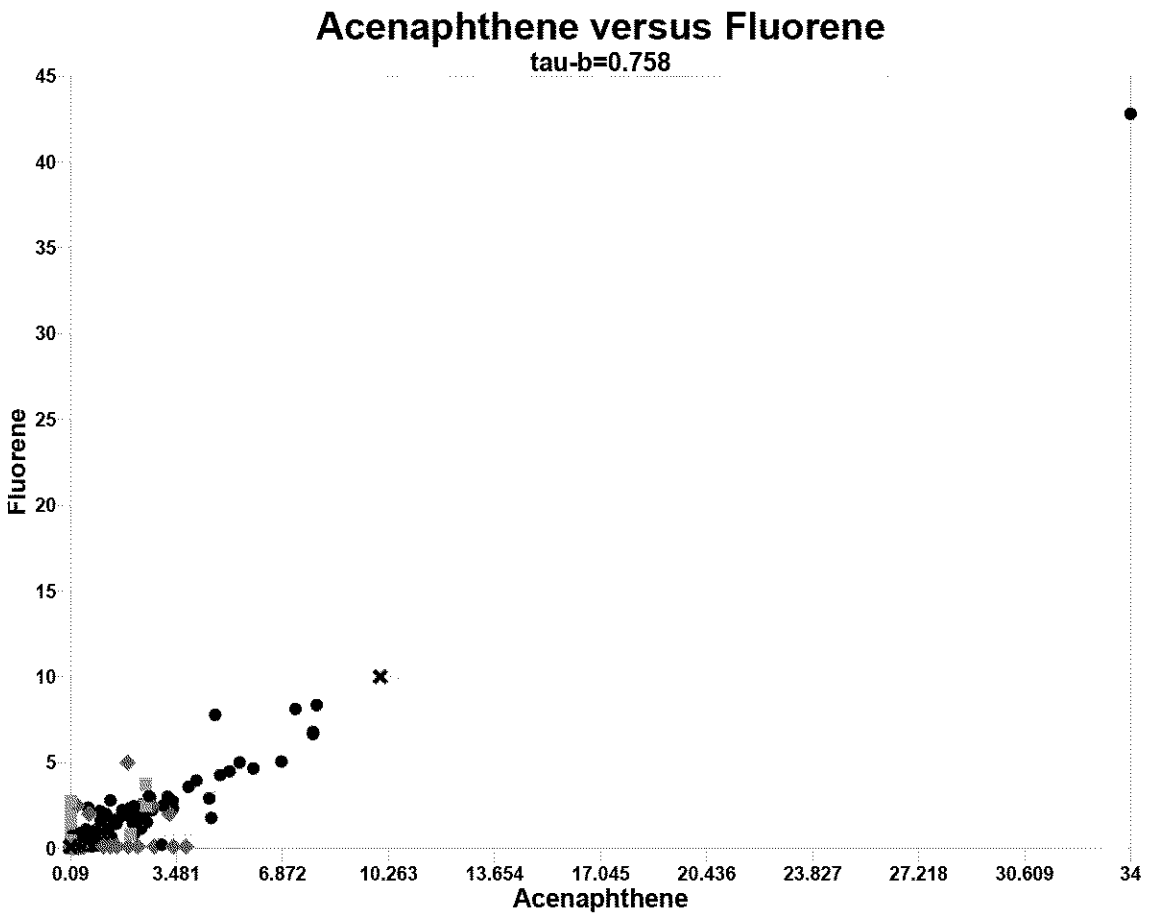
ATTACHMENT 1 - Analyte Correlations



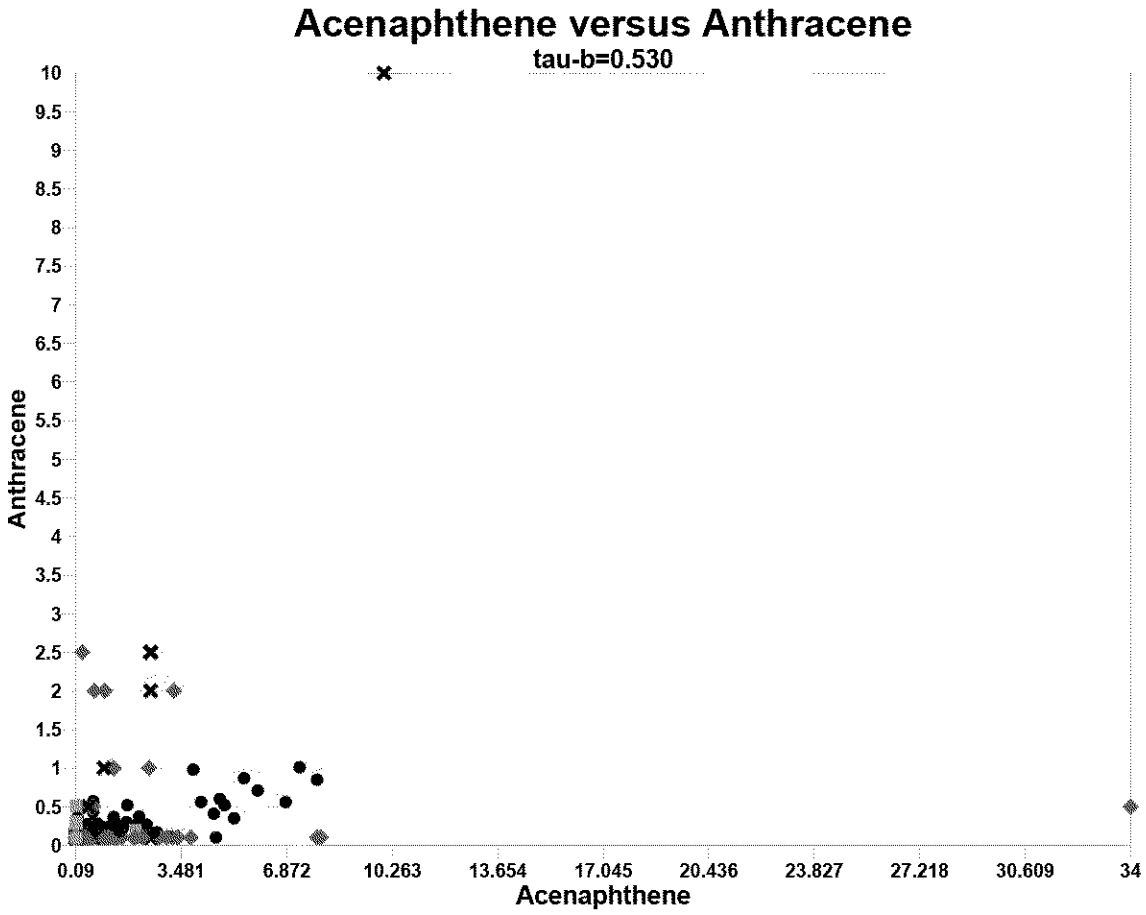
ATTACHMENT 1 - Analyte Correlations



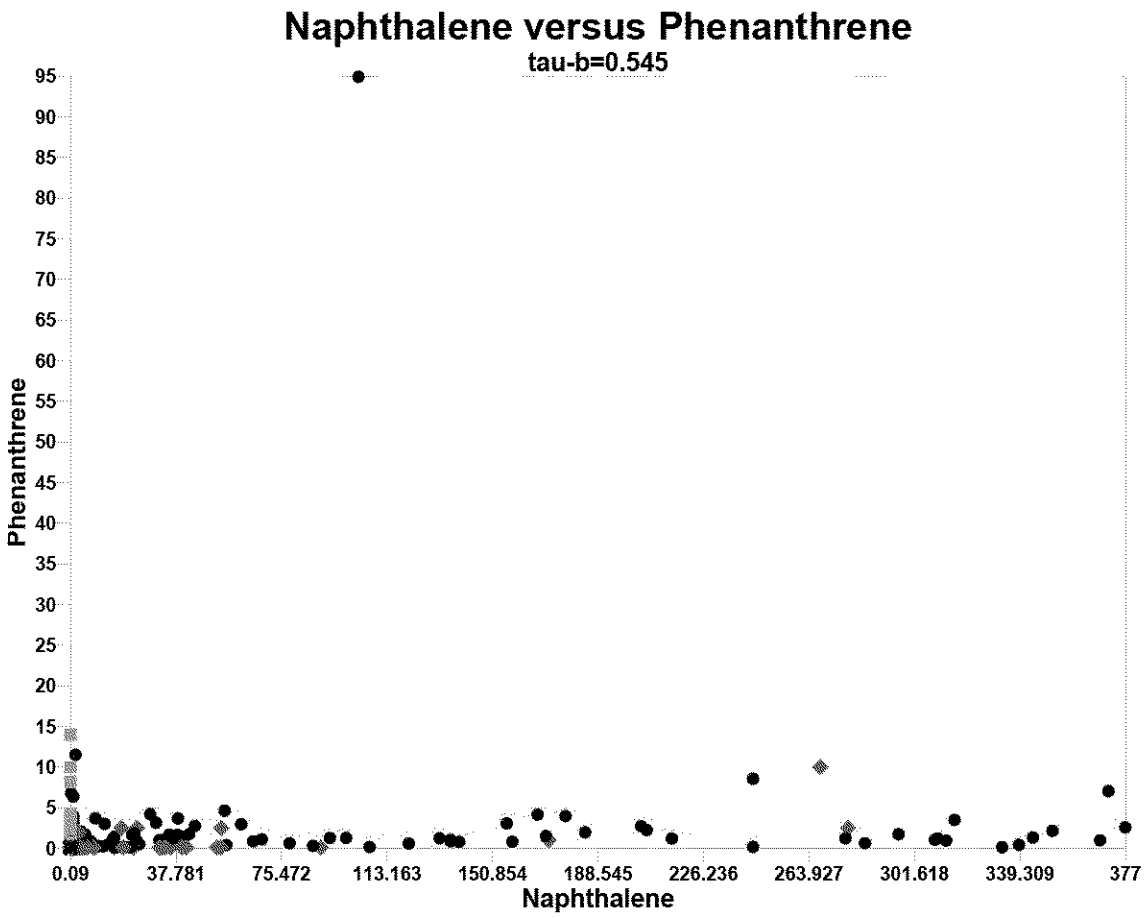
ATTACHMENT 1 - Analyte Correlations



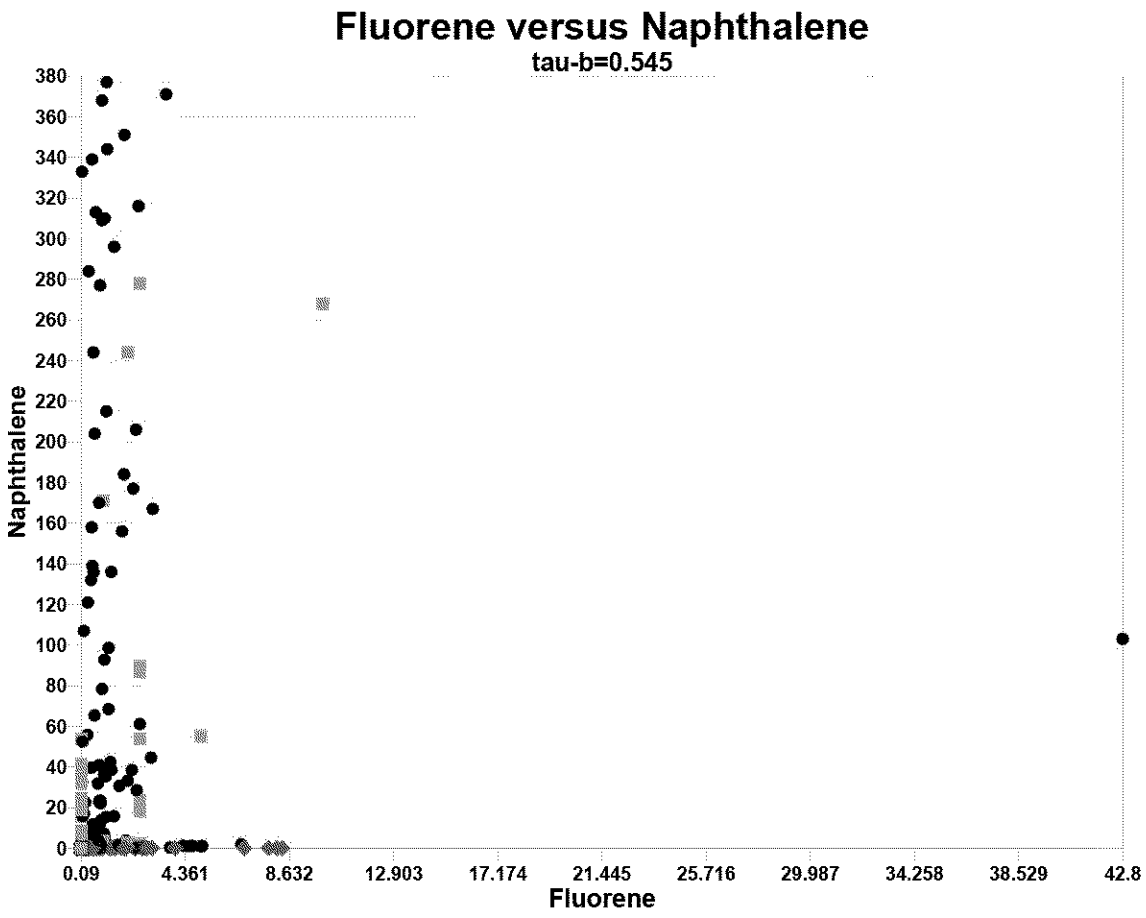
ATTACHMENT 1 - Analyte Correlations



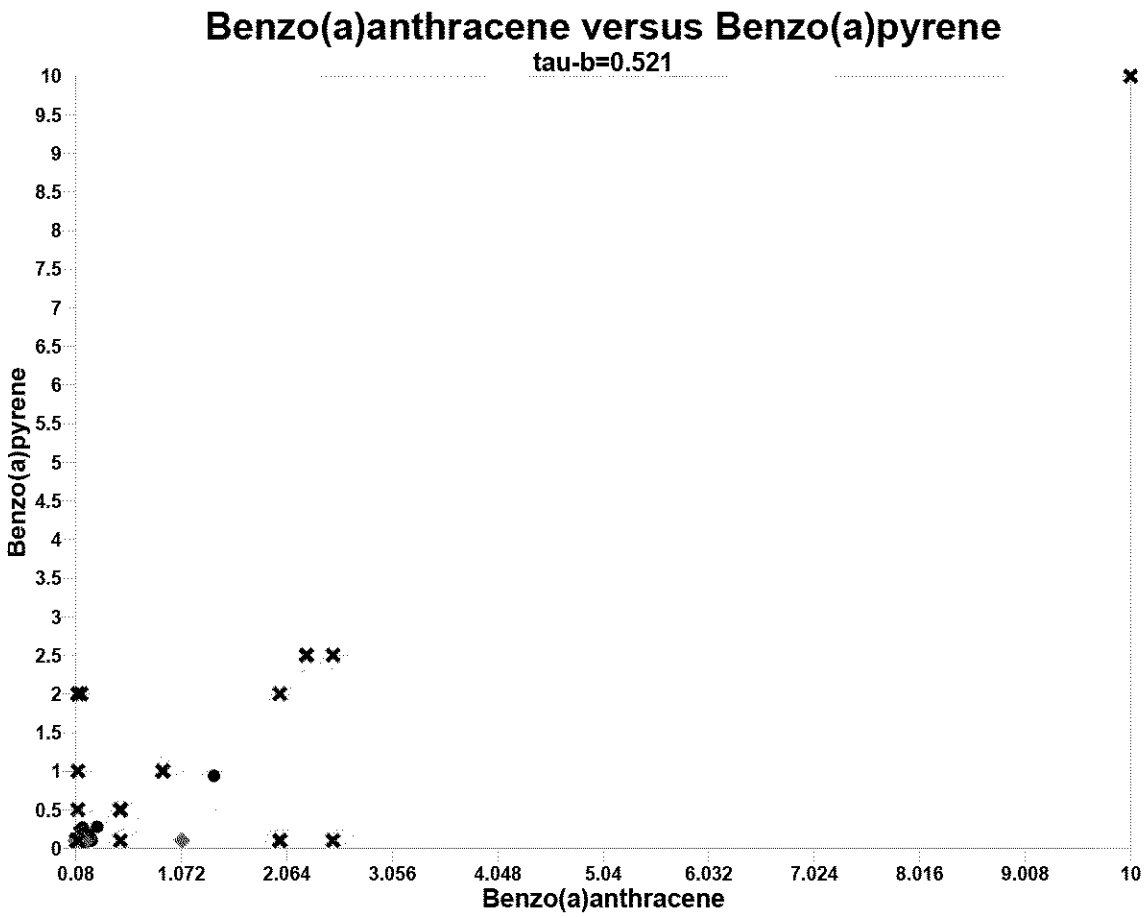
ATTACHMENT 1 - Analyte Correlations



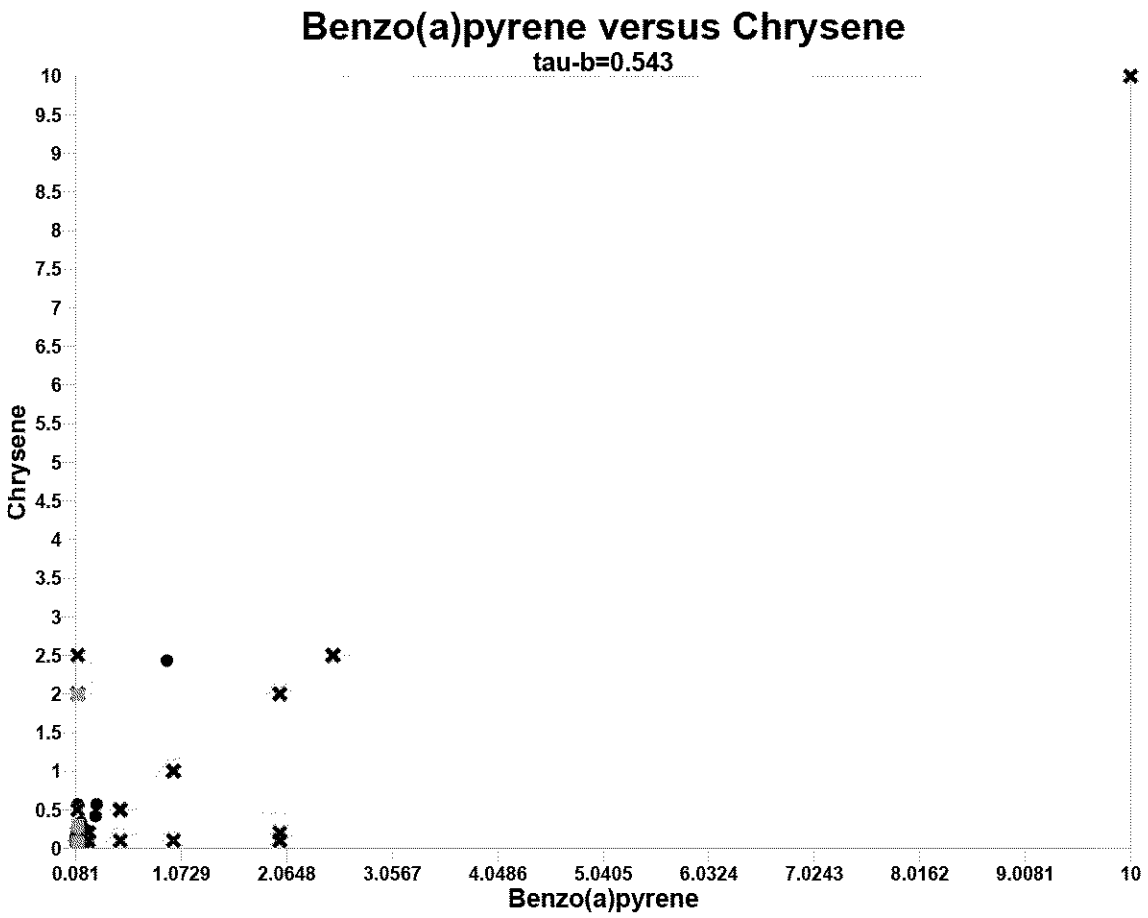
ATTACHMENT 1 - Analyte Correlations



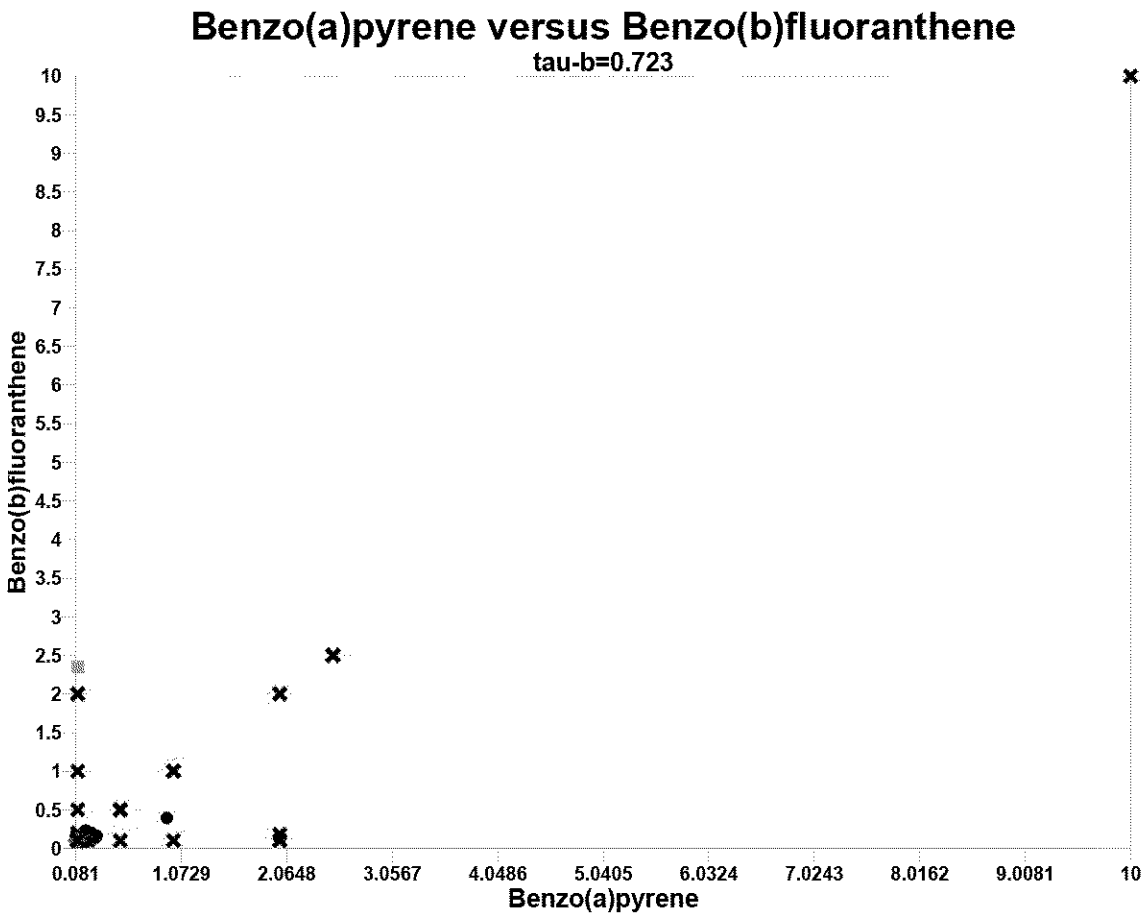
ATTACHMENT 1 - Analyte Correlations



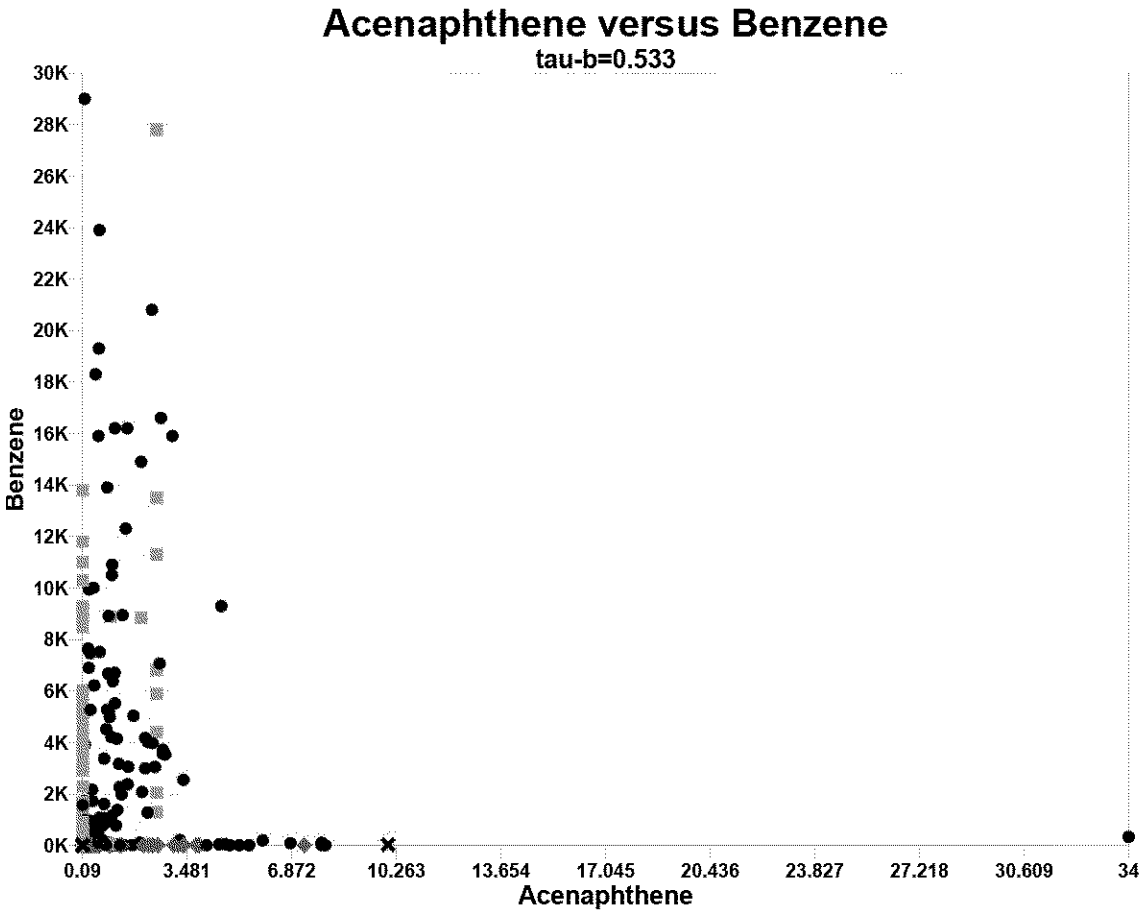
ATTACHMENT 1 - Analyte Correlations



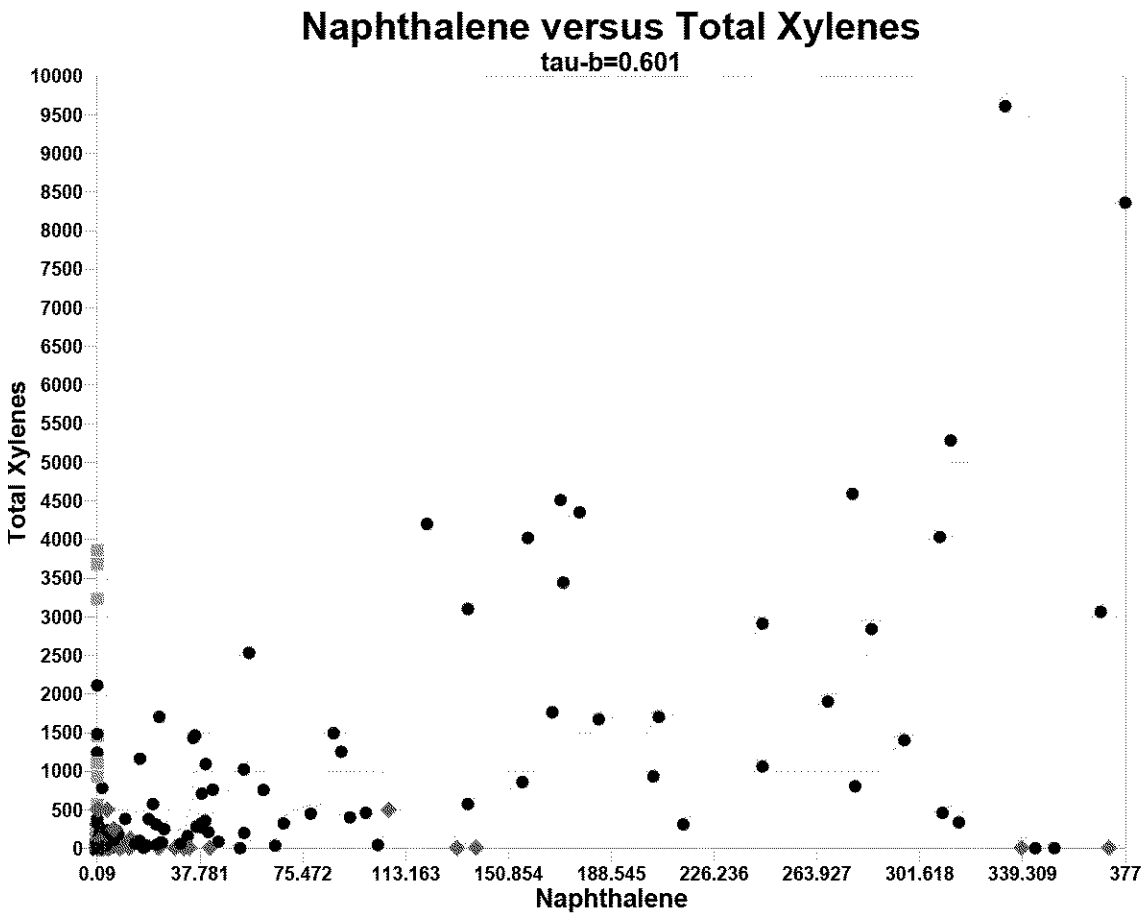
ATTACHMENT 1 - Analyte Correlations



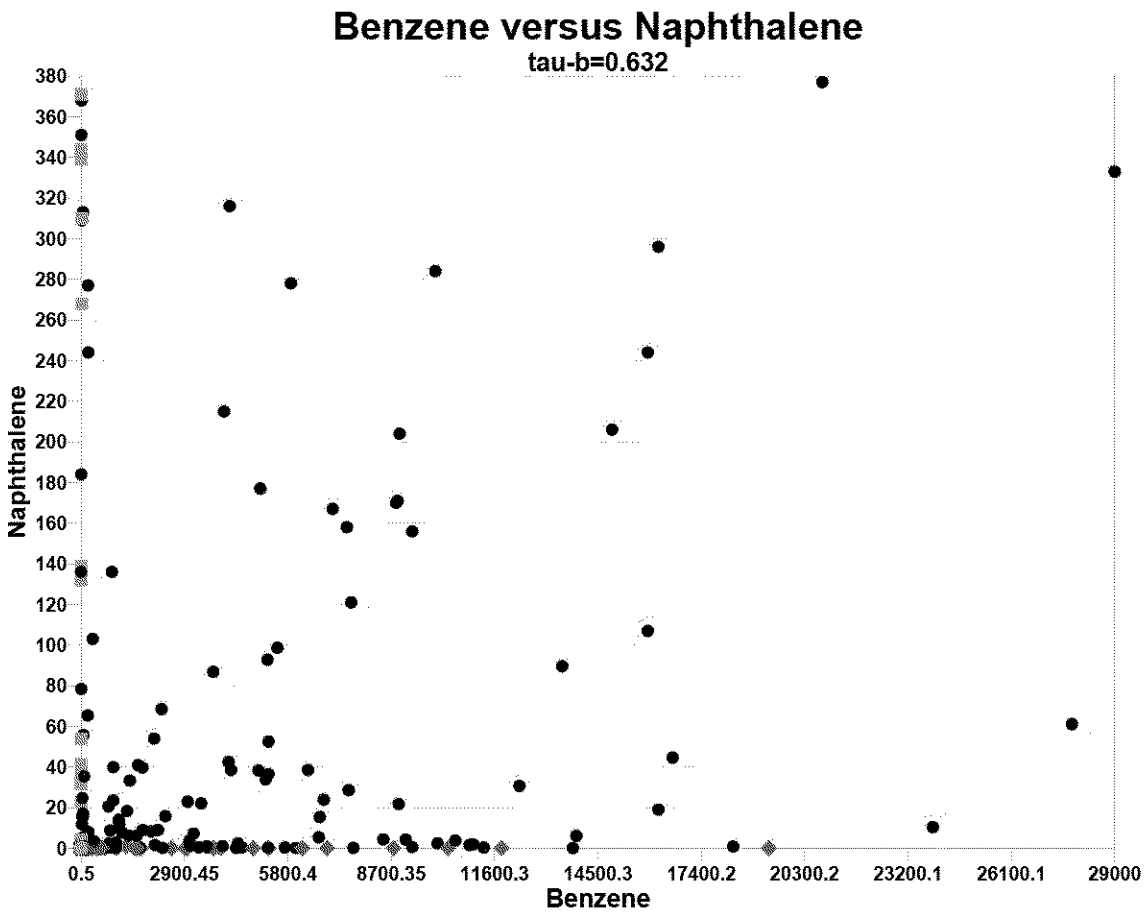
ATTACHMENT 1 - Analyte Correlations



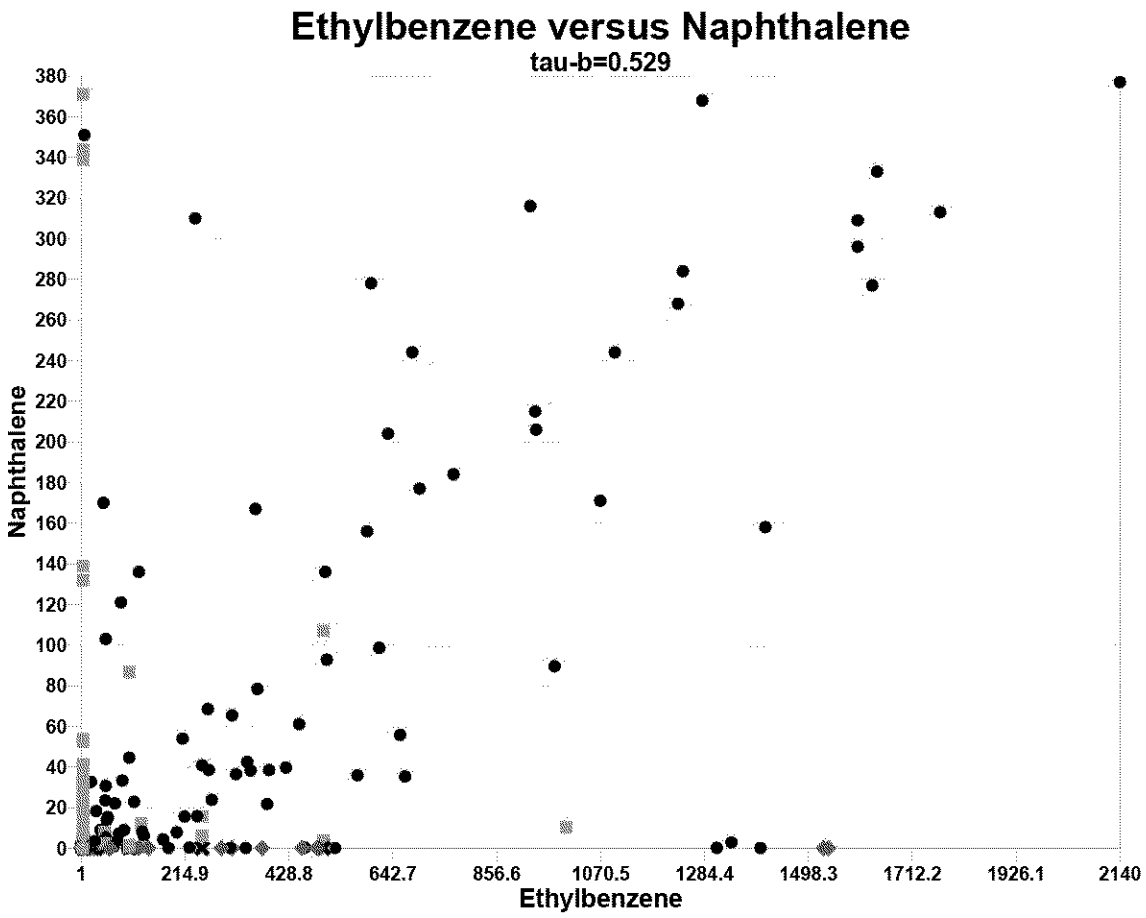
ATTACHMENT 1 - Analyte Correlations



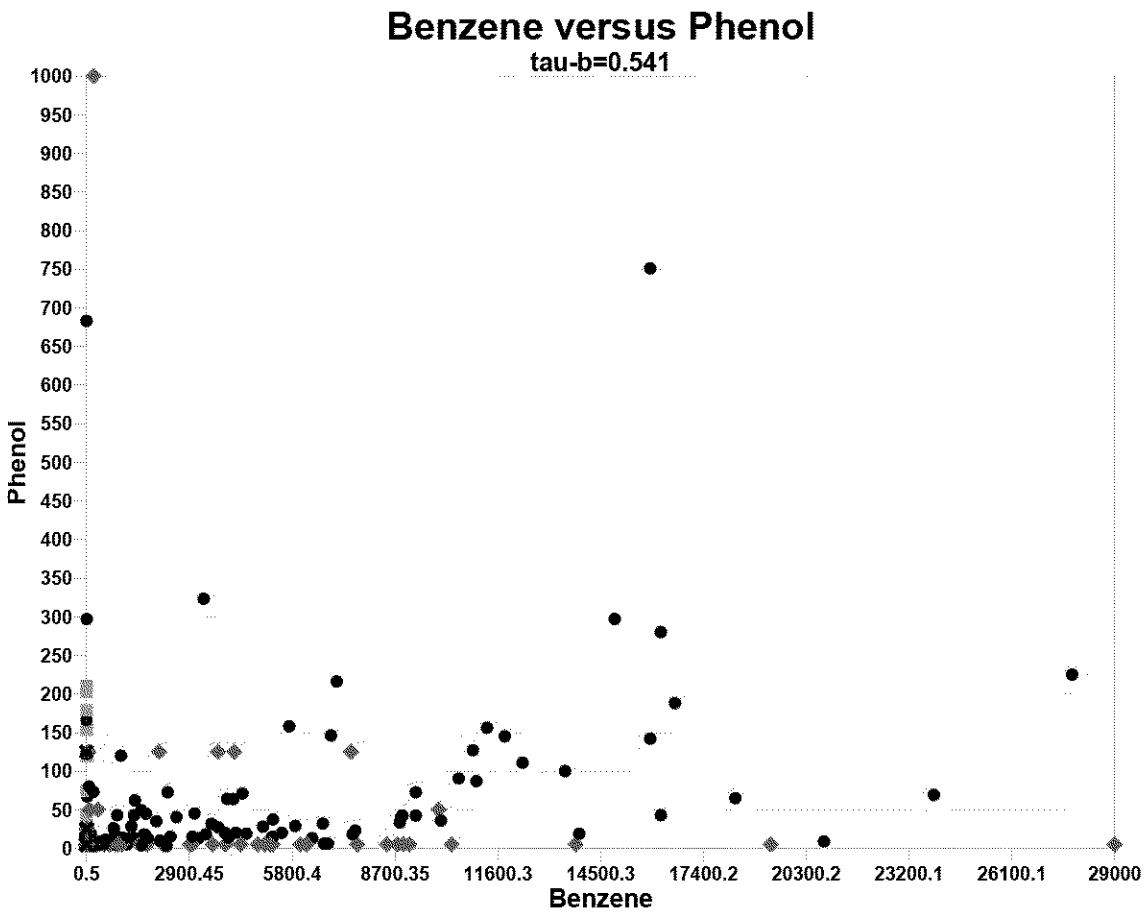
ATTACHMENT 1 - Analyte Correlations



ATTACHMENT 1 - Analyte Correlations



ATTACHMENT 1 - Analyte Correlations



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This design was last modified 2/4/2018 10:18:19 AM.

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* - The report contents may have been modified or reformatted by end-user of software.

Attachment 2

Benzene Temporal Analysis

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Summary

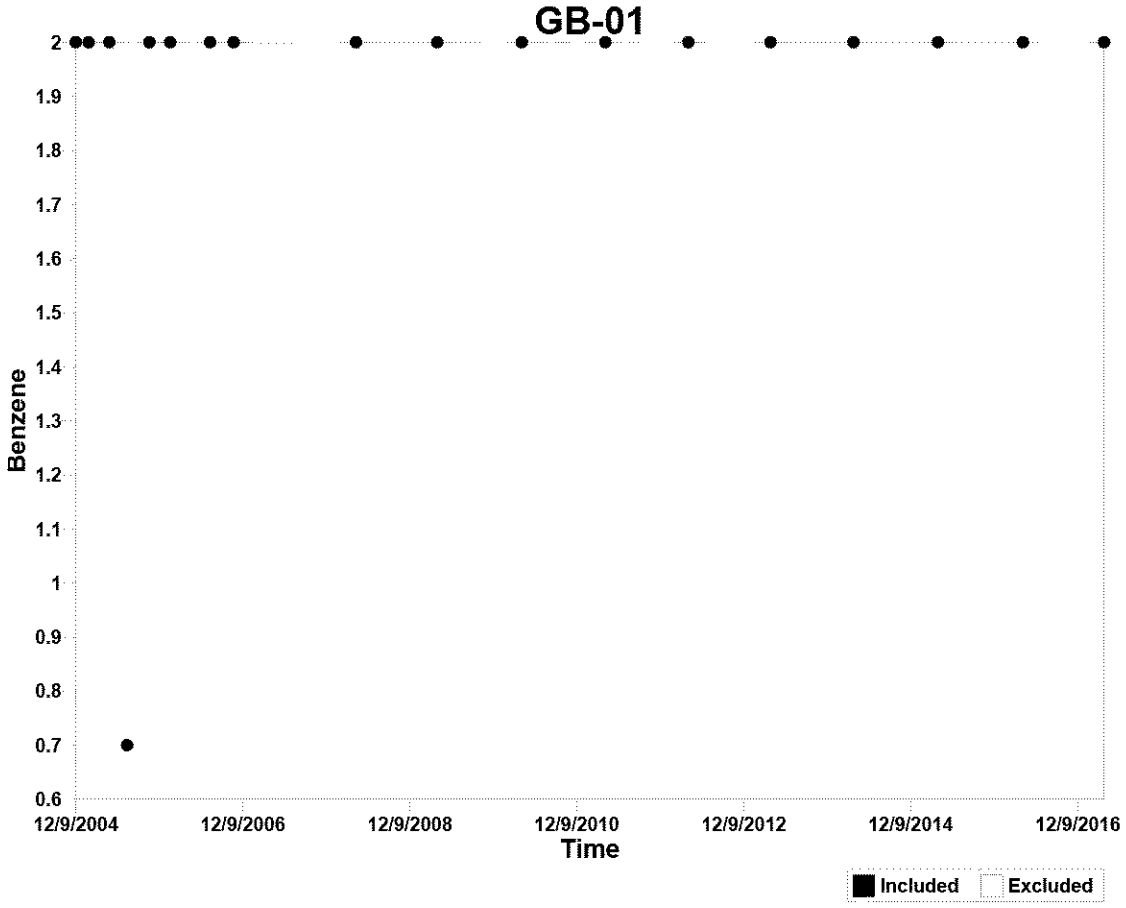
This report summarizes the process and parameters used to identify whether the current sampling frequency for a well or other regularly sampled location is suitable for a given purpose.

Primary Analysis Objective and Analytical Approach

The analysis goal is to identify and justify a sampling frequency that addresses the needs of the project. Once the data have been pre-processed to remove any outliers or significant time gaps, two different methods for analyzing temporal redundancy can be used. Iterative thinning simulates reduction of sampling frequency to varying degrees to identify with what level of reduction the original temporal patterns could have been preserved based on the historical data. Variogram analysis allows a temporal variogram to be calculated in order to fit a model that describes range of the temporal correlation. This can be used to estimate the minimum sampling interval between measurements that are independent or uncorrelated.

Data Pre-Processing

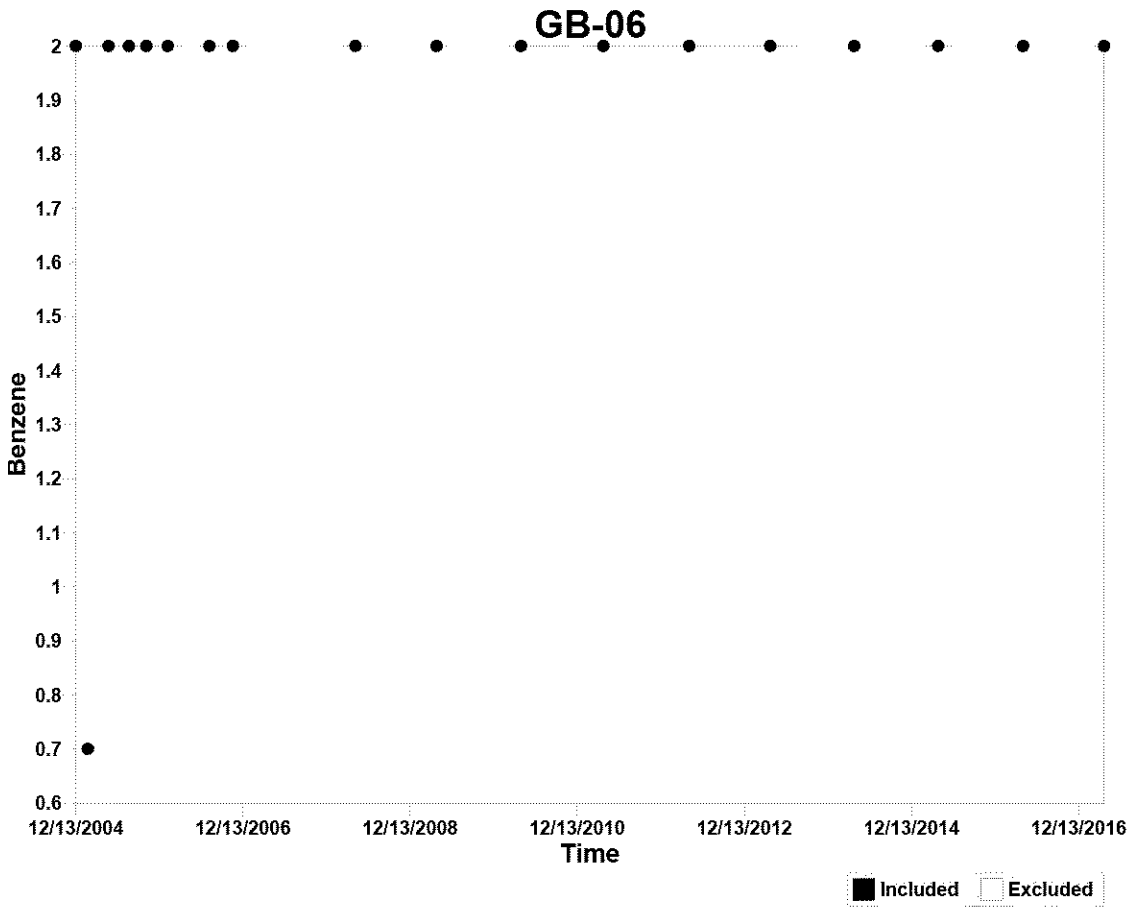
Because large temporal gaps and outliers can interfere with the temporal redundancy analysis, some of the data may be excluded from analysis to eliminate these types of problems. The plots below show the data for each location analyzed with the excluded data points highlighted in yellow, and the tables below list the data points with the points that were excluded from analysis in red italics.



GB-01							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
12/9/2004	2		7/20/2006	2		4/11/2012	2
2/3/2005	2		10/31/2006	2		4/5/2013	2
5/5/2005	2		4/18/2008	2		4/3/2014	2
7/22/2005	0.7		4/8/2009	2		4/8/2015	2

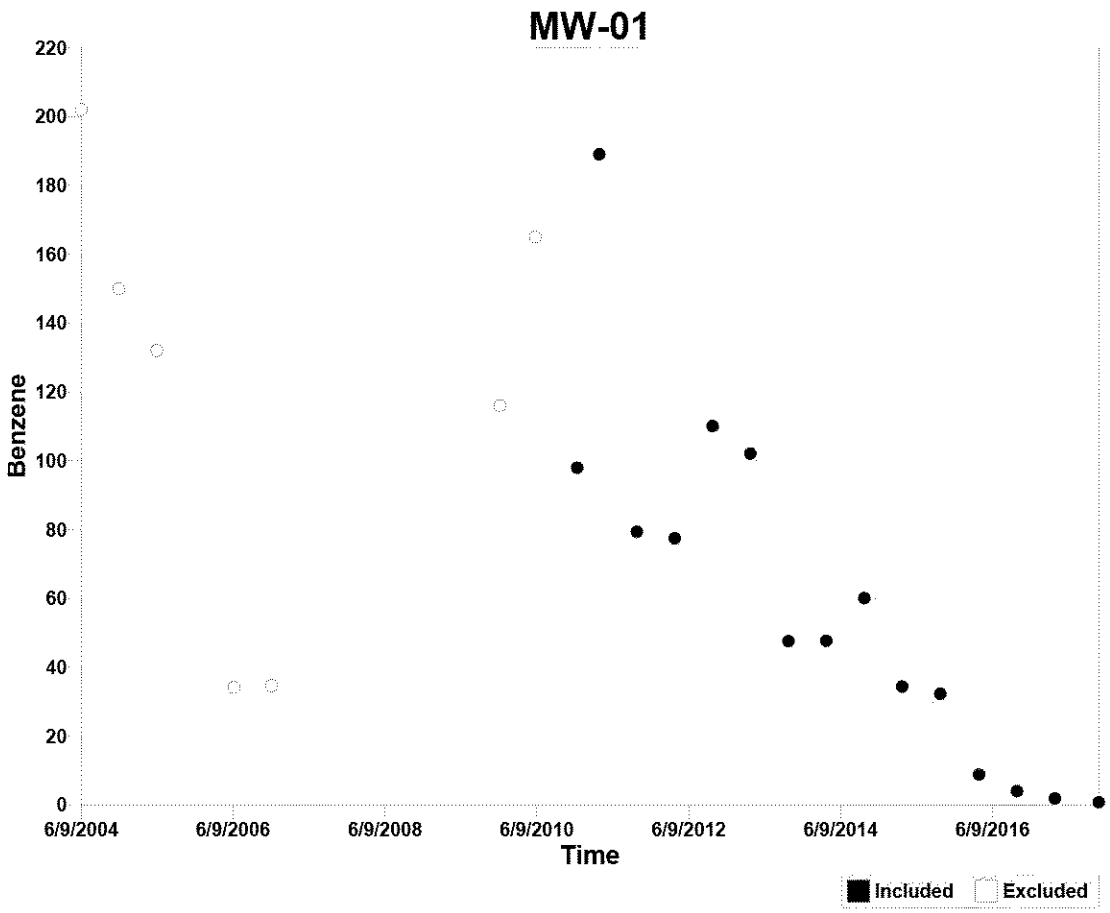
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

10/27/2005	2		4/13/2010	2		4/13/2016	2
1/26/2006	2		4/14/2011	2		4/3/2017	2



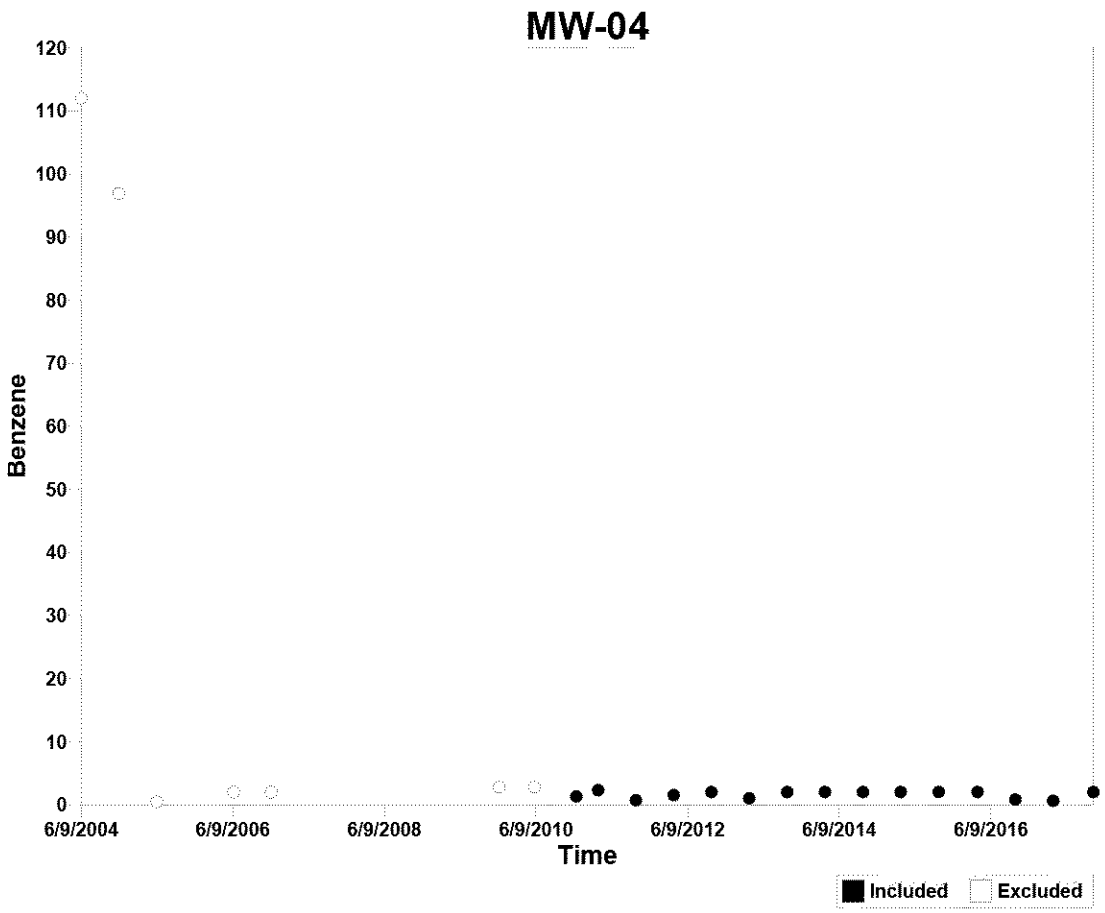
GB-06							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
12/13/2004	2		7/20/2006	2		4/16/2012	2
2/4/2005	0.7		10/31/2006	2		4/5/2013	2
5/5/2005	2		4/18/2008	2		4/7/2014	2
8/2/2005	2		4/8/2009	2		4/9/2015	2
10/18/2005	2		4/12/2010	2		4/14/2016	2
1/19/2006	2		4/7/2011	2		4/3/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



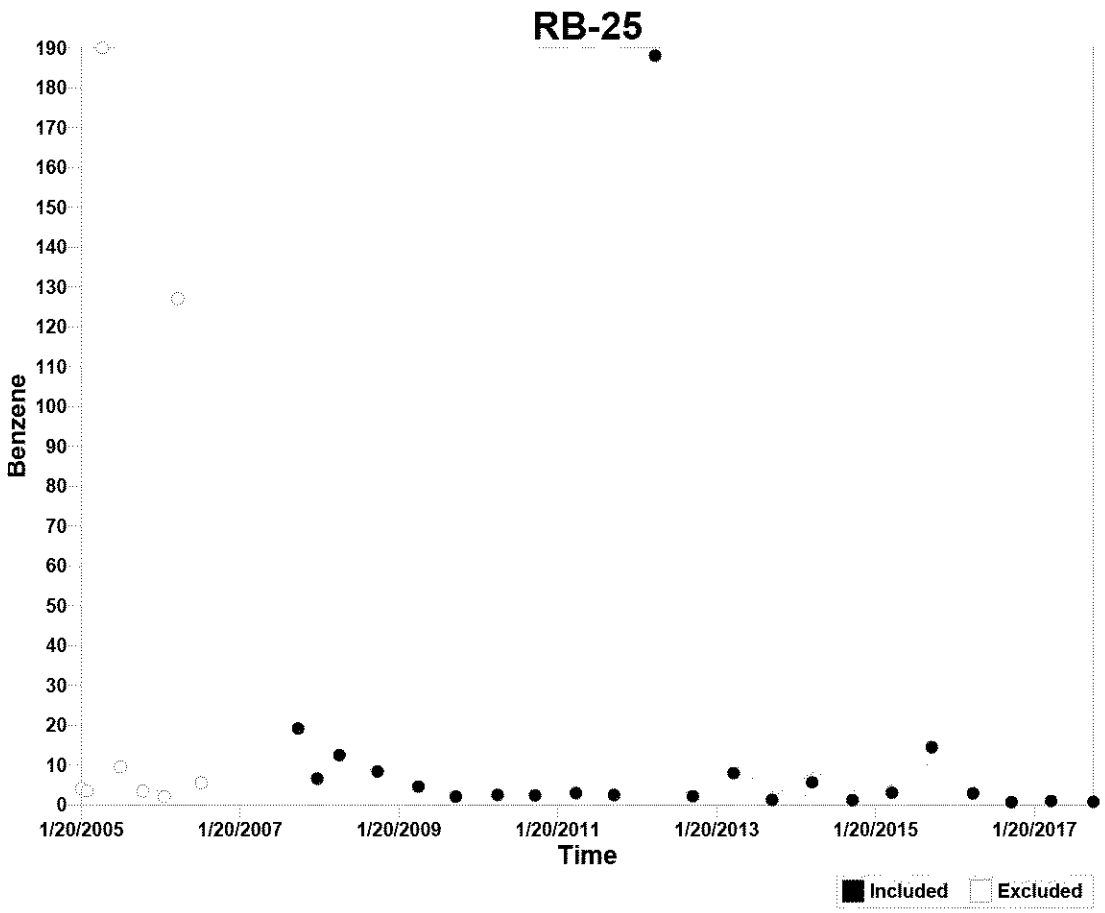
MW-01							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
6/9/2004	*202*		4/6/2011	189		4/2/2015	34.3
12/7/2004	*150*		10/4/2011	79.3		10/2/2015	32.2
6/8/2005	*132*		4/3/2012	77.4		4/6/2016	8.7
6/14/2006	*34.1*		10/2/2012	110		10/5/2016	3.9
12/11/2006	*34.6*		4/2/2013	102		4/5/2017	1.8
12/14/2009	*116*		10/2/2013	47.5		11/2/2017	0.7
6/2/2010	*165*		4/2/2014	47.6			
12/21/2010	97.9		10/2/2014	60			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



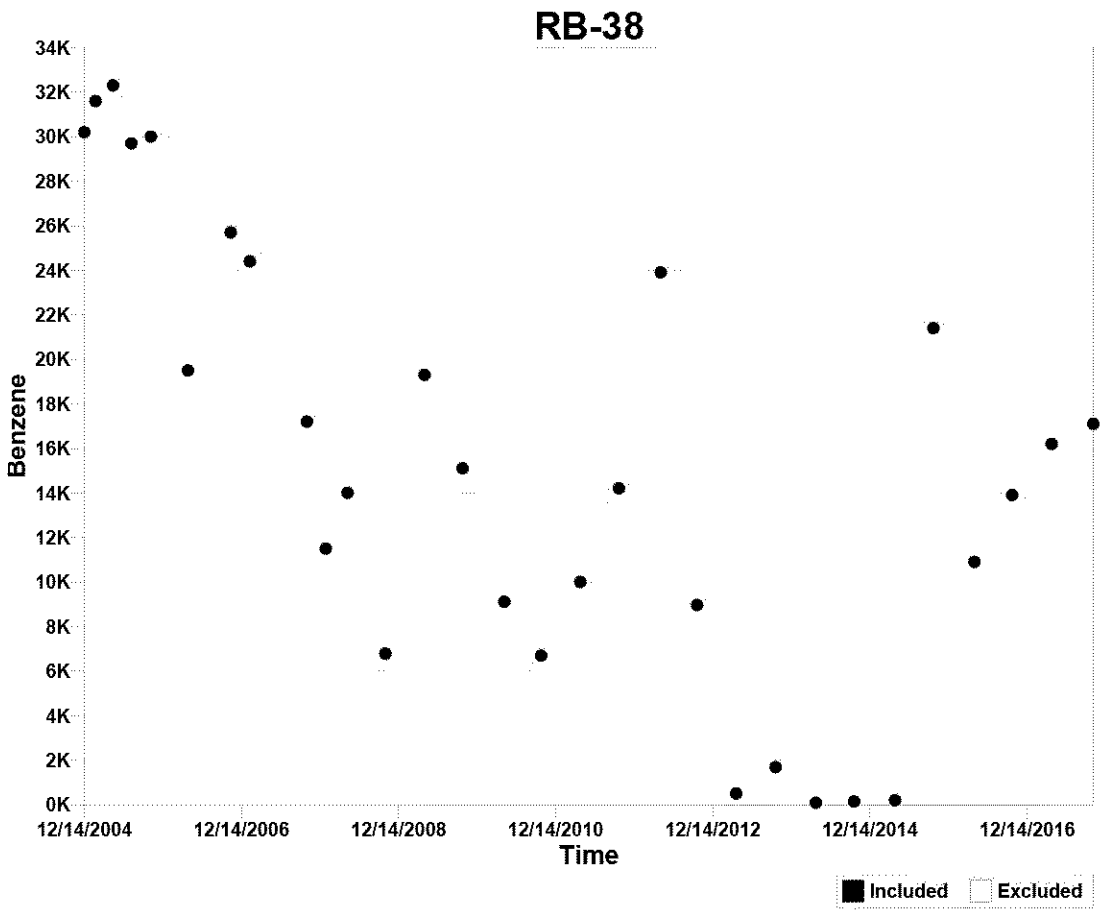
MW-04							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
6/9/2004	*112*		4/5/2011	2.3		4/2/2015	2
12/7/2004	*96.9*		10/4/2011	0.7		10/2/2015	2
6/8/2005	*0.5*		4/3/2012	1.5		4/6/2016	2
6/14/2006	*2*		10/2/2012	2		10/5/2016	0.8
12/11/2006	*2*		4/2/2013	1		4/5/2017	0.6
12/14/2009	*2.8*		10/2/2013	2		10/16/2017	2
6/2/2010	*2.8*		4/2/2014	2			
12/21/2010	1.3		10/2/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



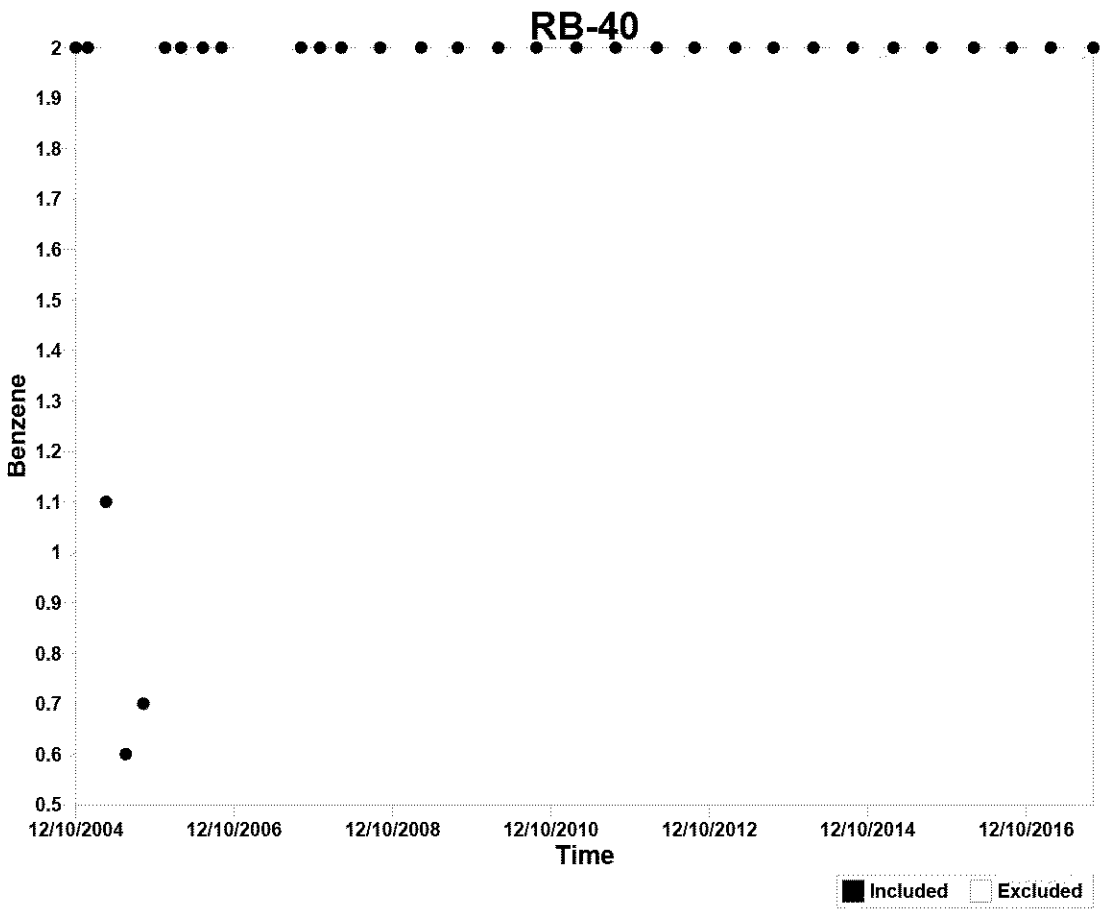
RB-25							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
1/20/2005	*4.1*		4/22/2008	12.4		4/8/2013	7.9
2/16/2005	*3.5*		10/14/2008	8.3		10/2/2013	1.2
4/27/2005	*190*		4/20/2009	4.5		4/4/2014	5.6
7/20/2005	*9.5*		10/9/2009	2		10/7/2014	1.1
10/31/2005	*3.4*		4/19/2010	2.4		4/6/2015	3
2/6/2006	*2*		10/8/2010	2.3		10/6/2015	14.4
4/10/2006	*127*		4/14/2011	2.9		4/13/2016	2.8
7/26/2006	*5.5*		10/6/2011	2.4		10/7/2016	0.6
10/15/2007	19.1		4/12/2012	188		4/7/2017	0.9
1/11/2008	6.5		10/3/2012	2.1		10/18/2017	0.7

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



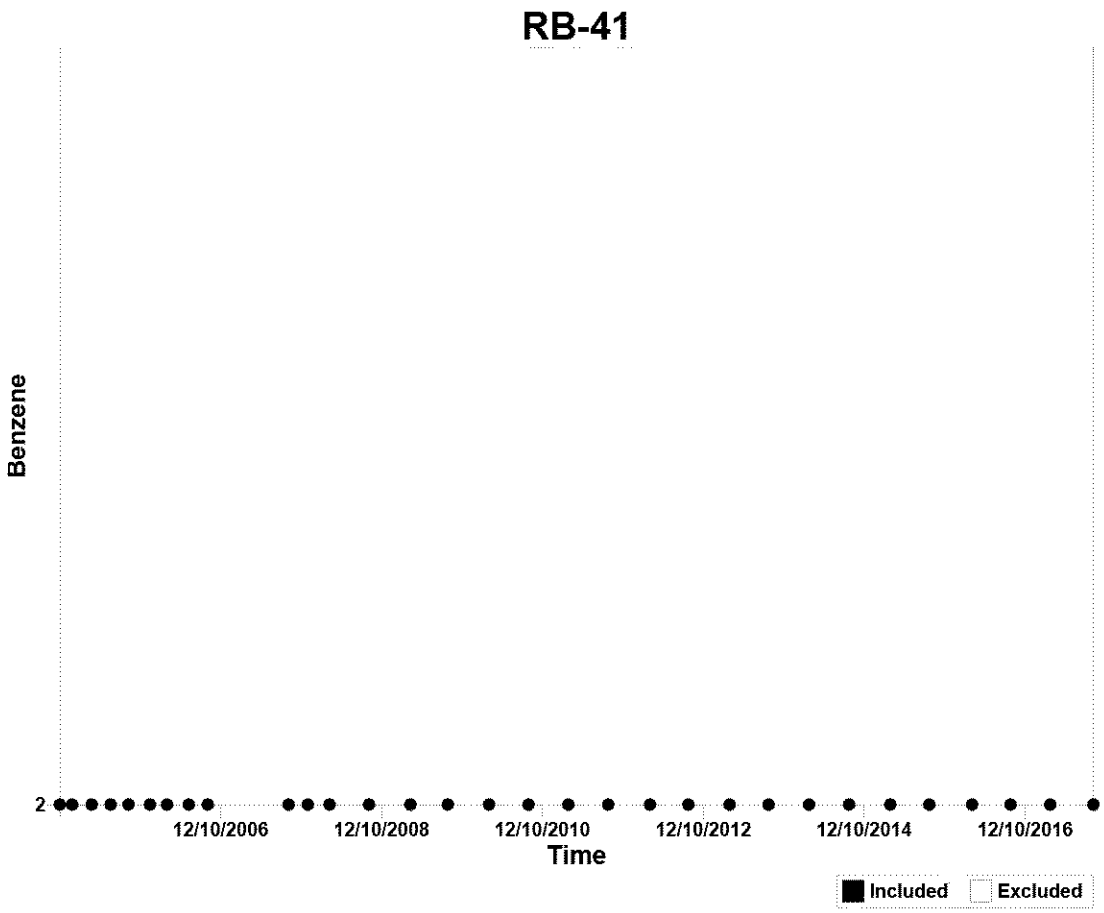
RB-38							
Time	Value		Time	Value		Time	Value
12/14/2004	30200		4/21/2008	14000		4/2/2013	495
2/4/2005	31600		10/14/2008	6780		10/2/2013	1680
4/27/2005	32300		4/14/2009	19300		4/7/2014	79.6
7/21/2005	29700		10/8/2009	15100		10/2/2014	138
10/20/2005	30000		4/20/2010	9110		4/10/2015	196
4/10/2006	19500		10/8/2010	6690		10/6/2015	21400
10/26/2006	25700		4/8/2011	10000		4/13/2016	10900
1/23/2007	24400		10/5/2011	14200		10/6/2016	13900
10/15/2007	17200		4/16/2012	23900		4/7/2017	16200
1/11/2008	11500		10/2/2012	8960		10/18/2017	17100

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RB-40							
Time	Value		Time	Value		Time	Value
12/10/2004	2		4/18/2008	2		10/2/2013	2
2/4/2005	2		10/14/2008	2		4/4/2014	2
4/29/2005	1.1		4/21/2009	2		10/3/2014	2
7/29/2005	0.6		10/7/2009	2		4/8/2015	2
10/18/2005	0.7		4/12/2010	2		10/2/2015	2
1/26/2006	2		10/5/2010	2		4/13/2016	2
4/10/2006	2		4/7/2011	2		10/5/2016	2
7/19/2006	2		10/5/2011	2		4/3/2017	2
10/13/2006	2		4/12/2012	2		10/16/2017	2
10/15/2007	2		10/3/2012	2			
1/10/2008	2		4/8/2013	2			

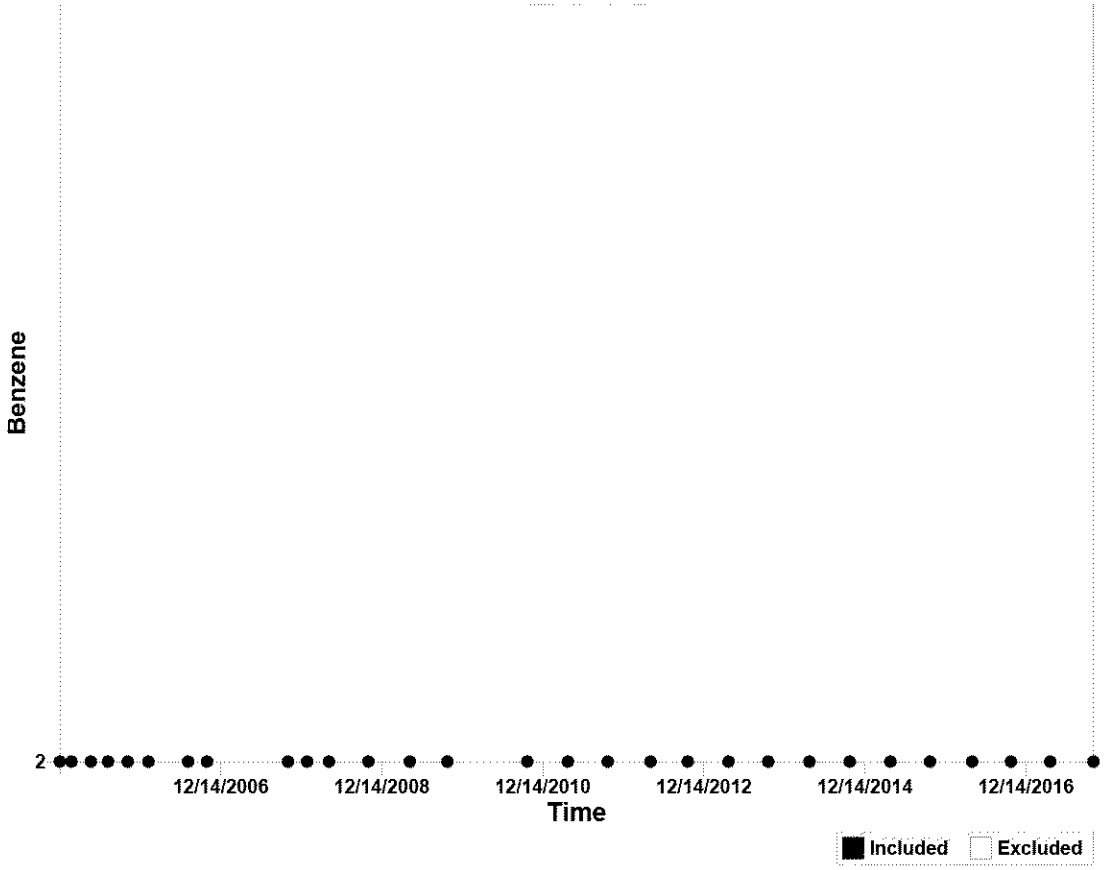
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RB-41							
Time	Value		Time	Value		Time	Value
12/10/2004	2		4/18/2008	2		10/2/2013	2
2/4/2005	2		10/14/2008	2		4/4/2014	2
5/4/2005	2		4/20/2009	2		10/3/2014	2
7/29/2005	2		10/7/2009	2		4/8/2015	2
10/18/2005	2		4/12/2010	2		10/2/2015	2
1/24/2006	2		10/8/2010	2		4/13/2016	2
4/11/2006	2		4/7/2011	2		10/5/2016	2
7/19/2006	2		10/5/2011	2		4/3/2017	2
10/13/2006	2		4/12/2012	2		10/16/2017	2
10/15/2007	2		10/3/2012	2			
1/10/2008	2		4/8/2013	2			

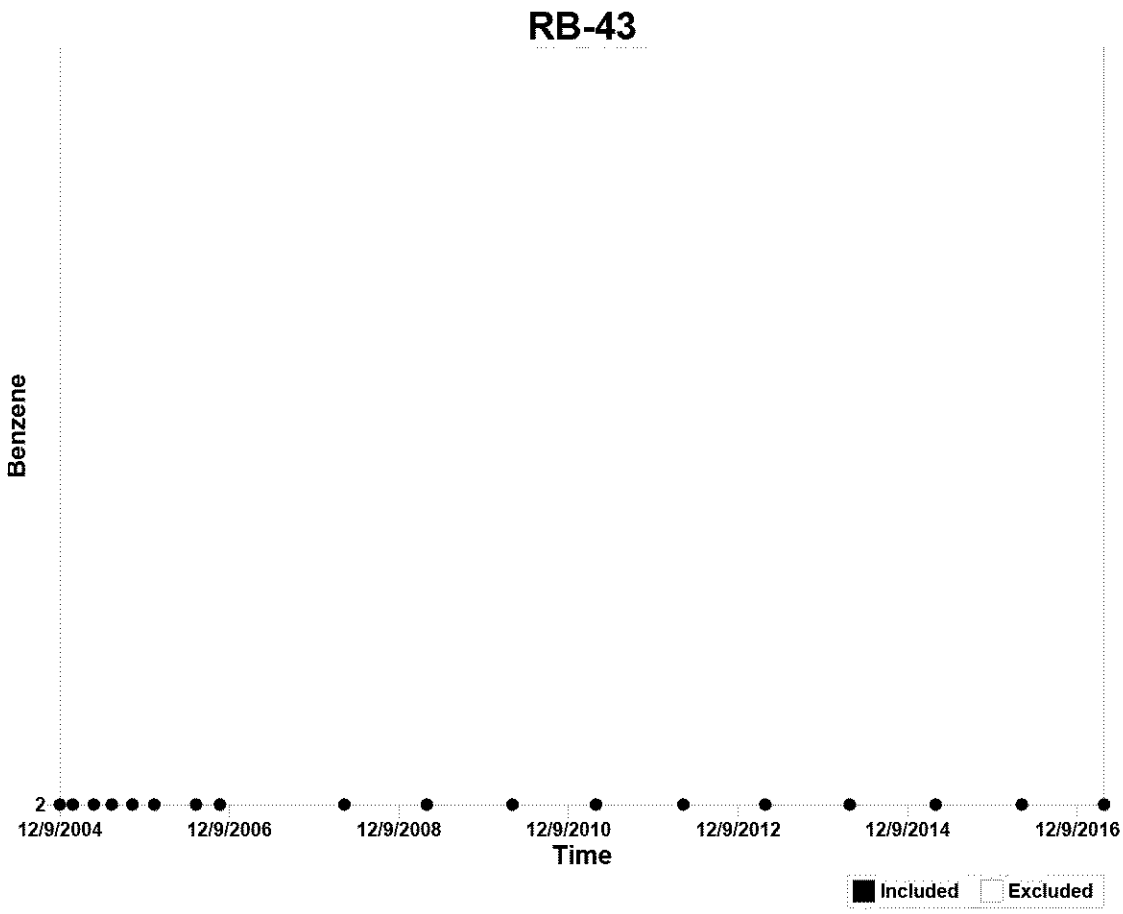
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RB-42



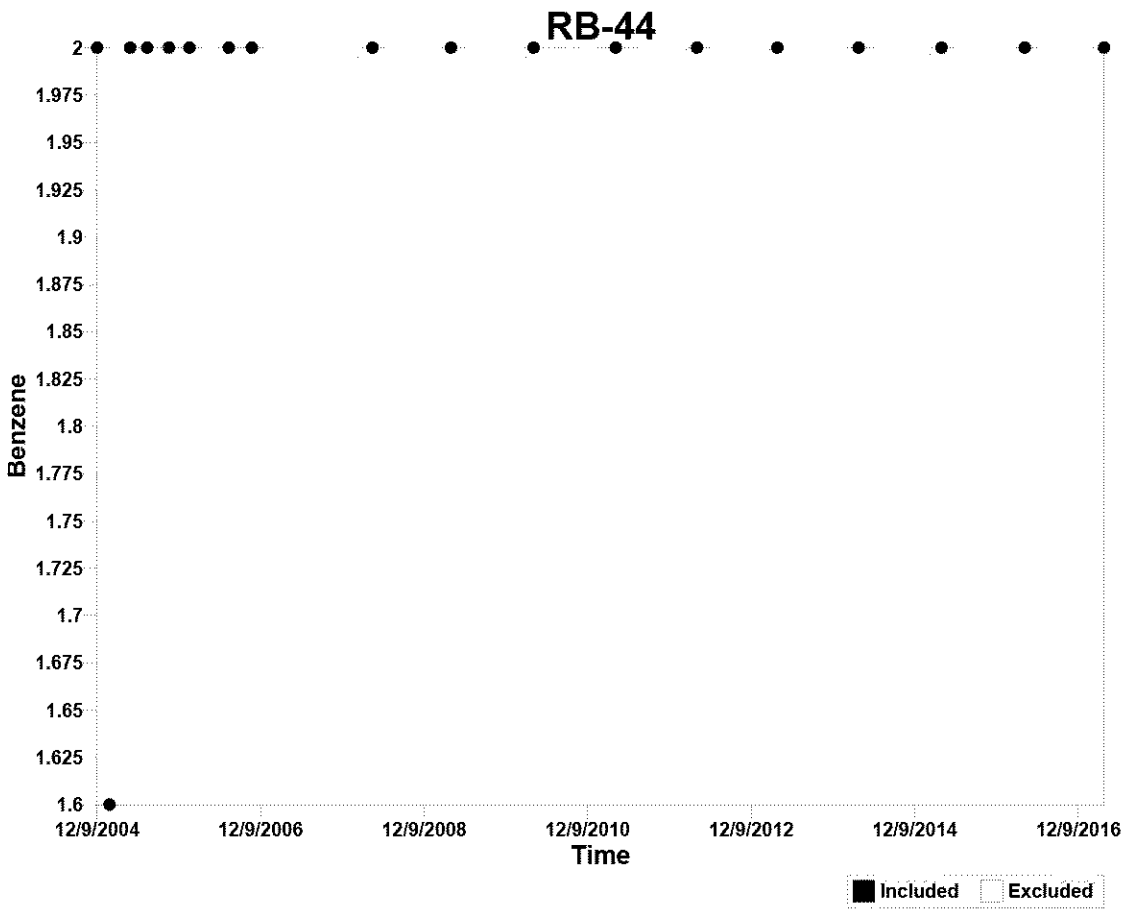
RB-42							
Time	Value		Time	Value		Time	Value
12/14/2004	2		4/18/2008	2		10/2/2013	2
2/5/2005	2		10/14/2008	2		4/7/2014	2
5/4/2005	2		4/20/2009	2		10/7/2014	2
7/21/2005	2		10/7/2009	2		4/9/2015	2
10/18/2005	2		10/5/2010	2		10/6/2015	2
1/20/2006	2		4/7/2011	2		4/14/2016	2
7/19/2006	2		10/5/2011	2		10/7/2016	2
10/13/2006	2		4/16/2012	2		4/3/2017	2
10/15/2007	2		10/2/2012	2		10/16/2017	2
1/10/2008	2		4/5/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



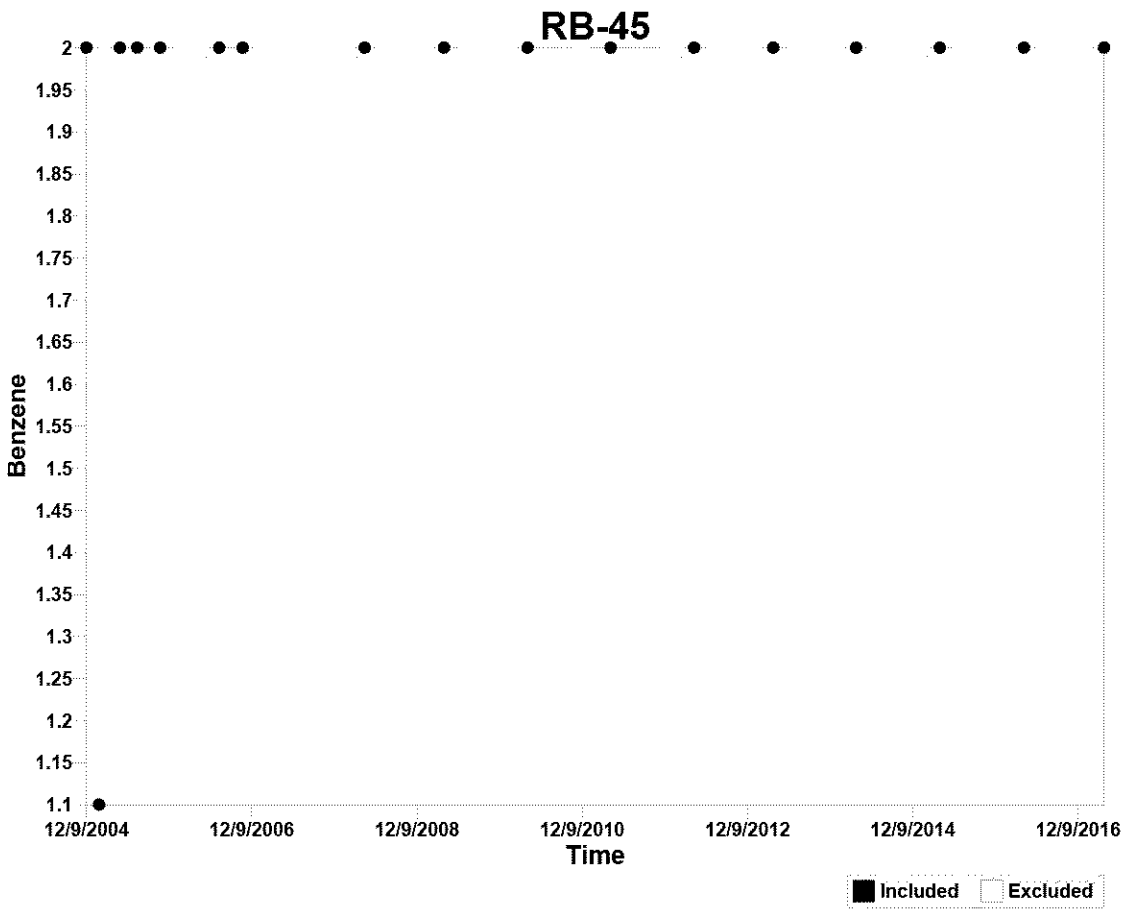
RB-43							
Time	Value		Time	Value		Time	Value
12/9/2004	2		7/19/2006	2		4/17/2012	2
2/3/2005	2		10/30/2006	2		4/5/2013	2
5/5/2005	2		4/18/2008	2		4/4/2014	2
7/21/2005	2		4/8/2009	2		4/9/2015	2
10/18/2005	2		4/12/2010	2		4/14/2016	2
1/20/2006	2		4/7/2011	2		4/3/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



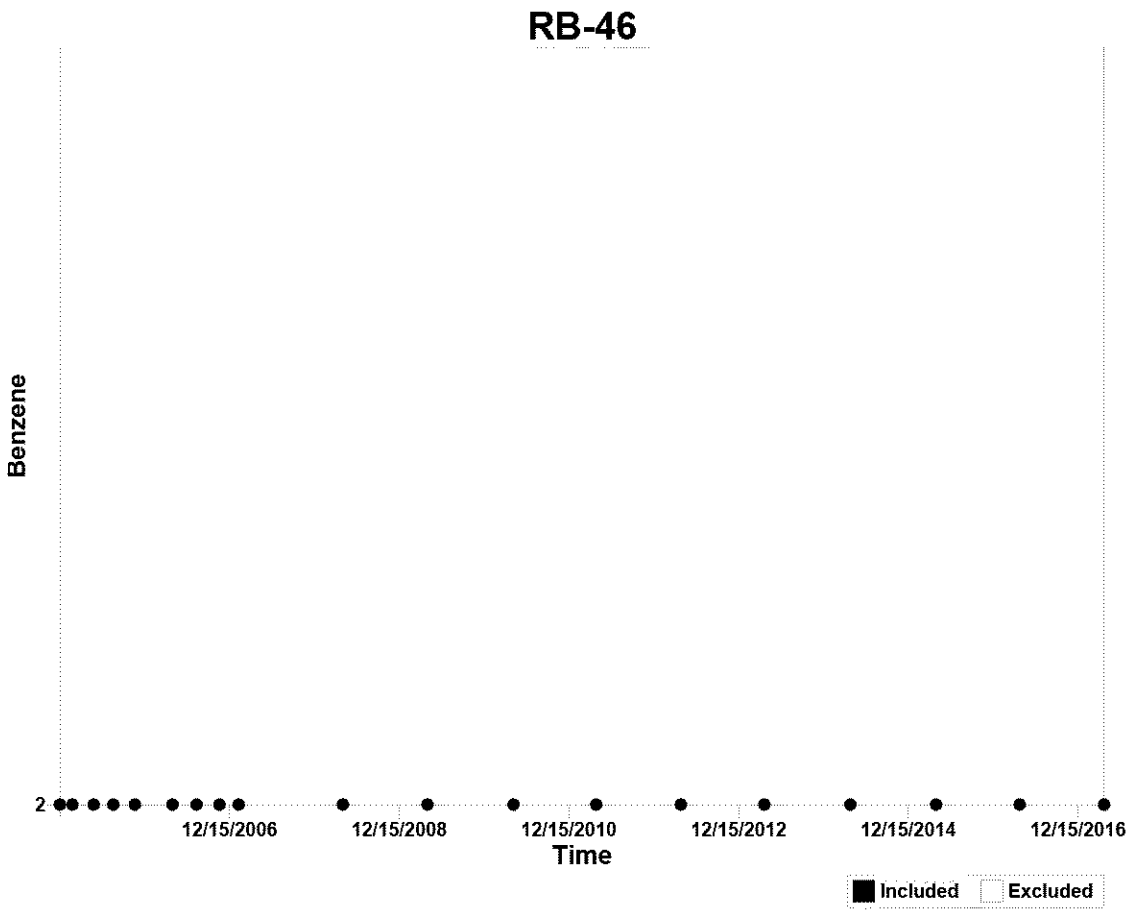
RB-44							
Time	Value		Time	Value		Time	Value
12/9/2004	2		7/20/2006	2		4/11/2012	2
2/3/2005	1.6		10/31/2006	2		4/5/2013	2
5/6/2005	2		4/22/2008	2		4/3/2014	2
7/21/2005	2		4/8/2009	2		4/8/2015	2
10/26/2005	2		4/12/2010	2		4/14/2016	2
1/26/2006	2		4/14/2011	2		4/3/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



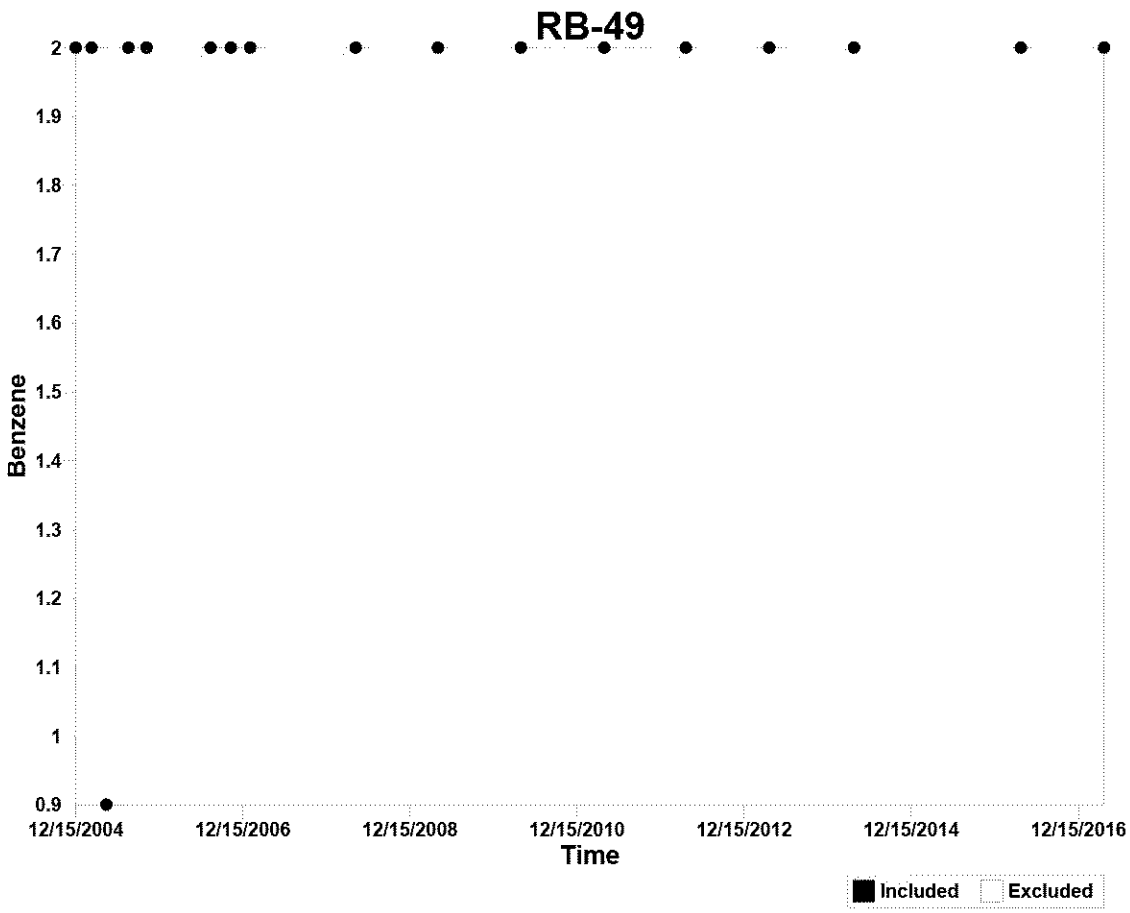
RB-45							
Time	Value		Time	Value		Time	Value
12/9/2004	2		10/31/2006	2		4/2/2013	2
2/3/2005	1.1		4/22/2008	2		4/3/2014	2
5/6/2005	2		4/8/2009	2		4/8/2015	2
7/22/2005	2		4/12/2010	2		4/14/2016	2
10/31/2005	2		4/14/2011	2		4/3/2017	2
7/19/2006	2		4/17/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



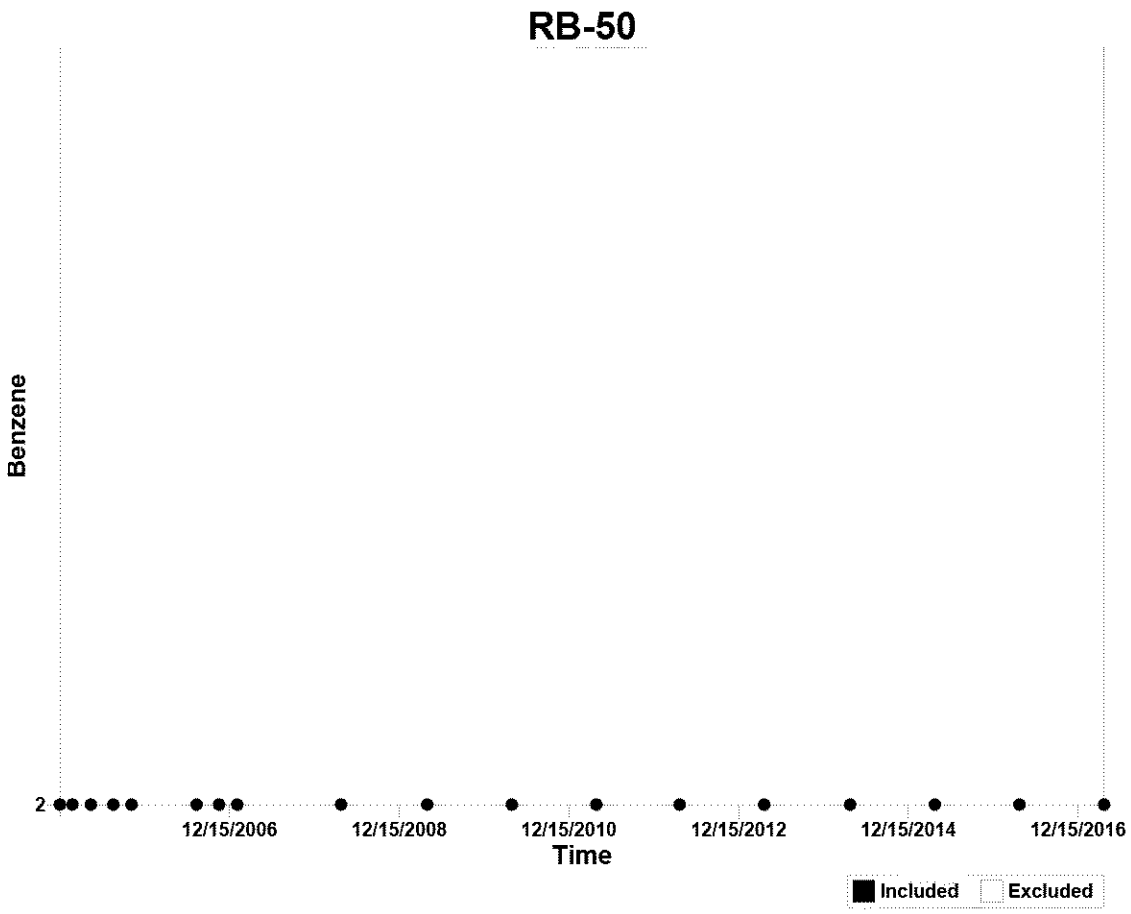
RB-46							
Time	Value		Time	Value		Time	Value
12/15/2004	2		11/2/2006	2		4/5/2013	2
2/7/2005	2		1/24/2007	2		4/10/2014	2
5/10/2005	2		4/17/2008	2		4/14/2015	2
8/2/2005	2		4/16/2009	2		4/8/2016	2
11/3/2005	2		4/21/2010	2		4/6/2017	2
4/14/2006	2		4/12/2011	2			
7/27/2006	2		4/11/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



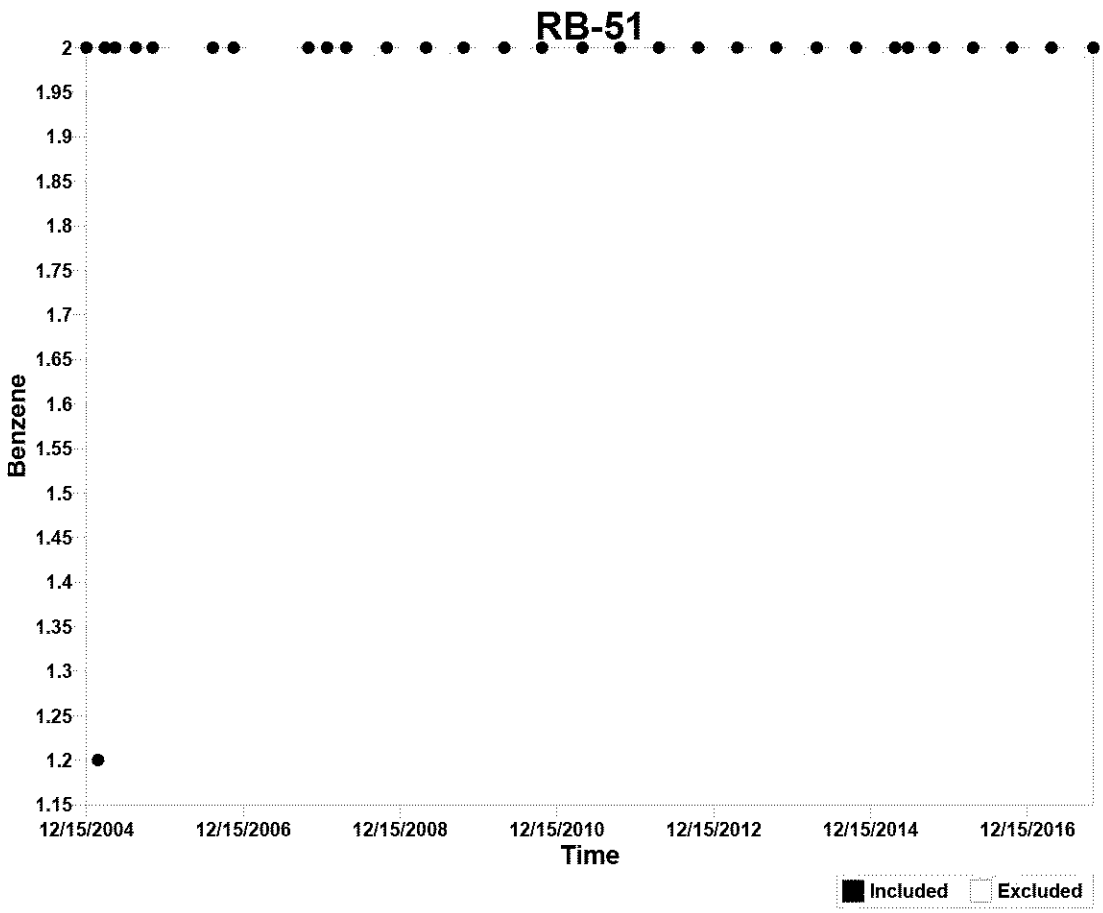
RB-49							
Time	Value		Time	Value		Time	Value
12/15/2004	2		10/24/2006	2		4/4/2012	2
2/22/2005	2		1/17/2007	2		4/4/2013	2
4/28/2005	0.9		4/22/2008	2		4/9/2014	2
8/2/2005	2		4/16/2009	2		4/7/2016	2
10/21/2005	2		4/14/2010	2		4/6/2017	2
7/27/2006	2		4/13/2011	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



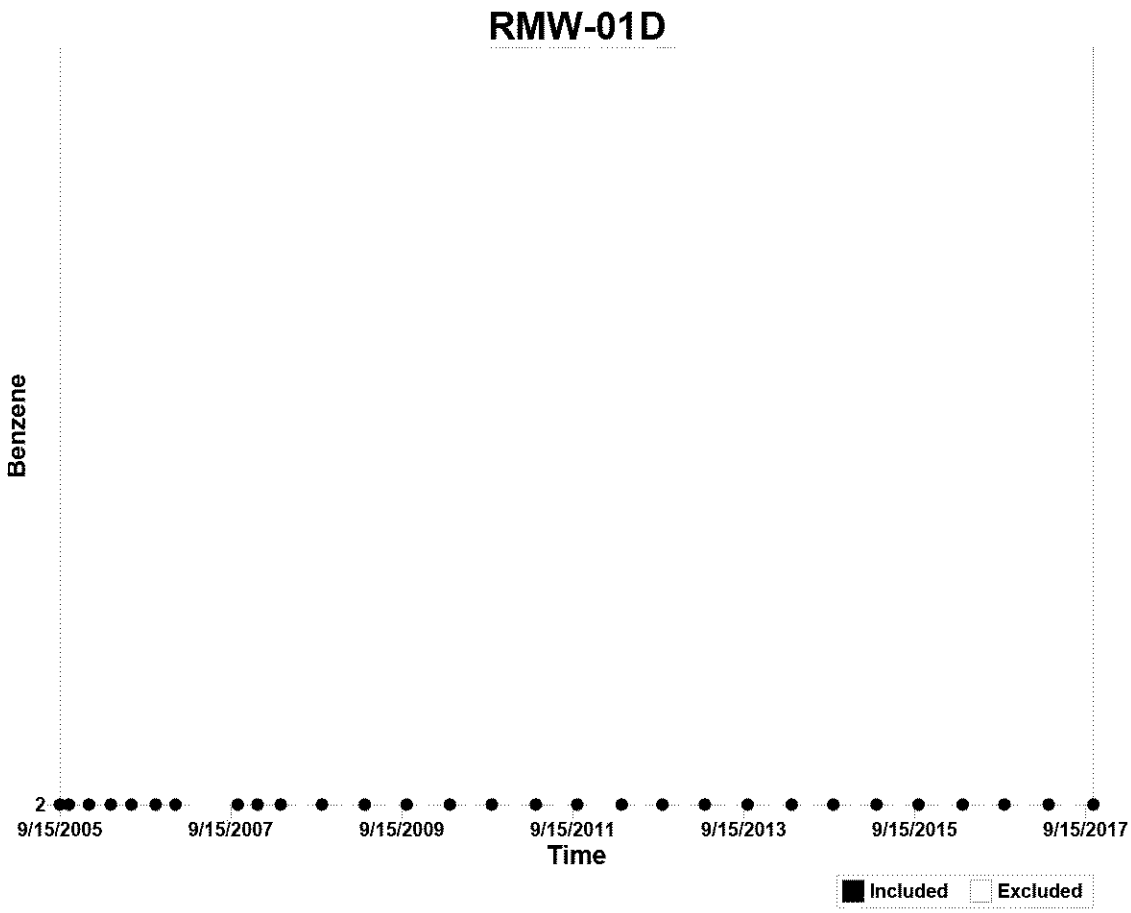
RB-50							
Time	Value		Time	Value		Time	Value
12/15/2004	2		11/1/2006	2		4/5/2012	2
2/7/2005	2		1/18/2007	2		4/4/2013	2
4/28/2005	2		4/9/2008	2		4/9/2014	2
8/2/2005	2		4/15/2009	2		4/9/2015	2
10/20/2005	2		4/14/2010	2		4/7/2016	2
7/27/2006	2		4/13/2011	2		4/6/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



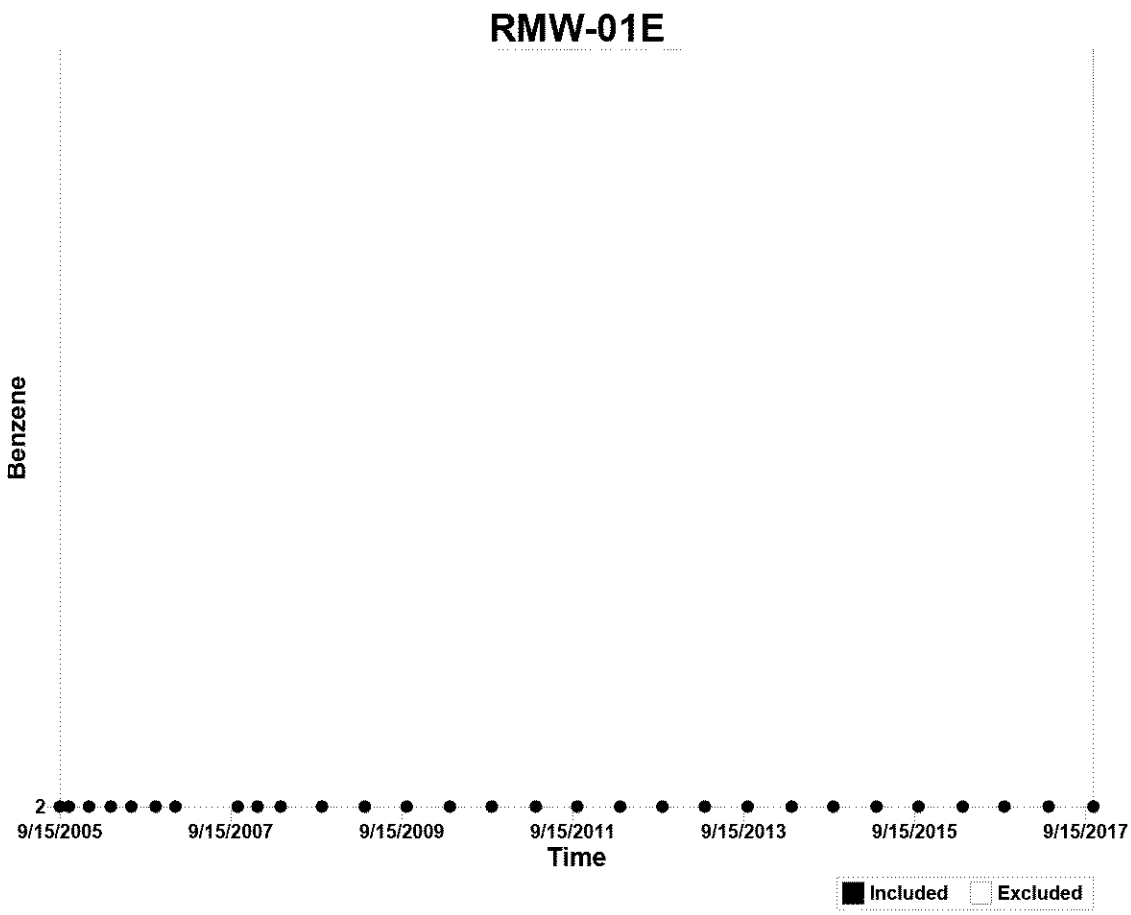
RB-51							
Time	Value		Time	Value		Time	Value
12/15/2004	2		10/14/2008	2		4/9/2014	2
2/7/2005	1.2		4/15/2009	2		10/8/2014	2
3/11/2005	2		10/7/2009	2		4/9/2015	2
4/28/2005	2		4/14/2010	2		6/8/2015	2
8/2/2005	2		10/7/2010	2		10/8/2015	2
10/20/2005	2		4/13/2011	2		4/6/2016	2
7/27/2006	2		10/6/2011	2		10/5/2016	2
11/1/2006	2		4/4/2012	2		4/6/2017	2
10/15/2007	2		10/4/2012	2		10/18/2017	2
1/10/2008	2		4/4/2013	2			
4/8/2008	2		10/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



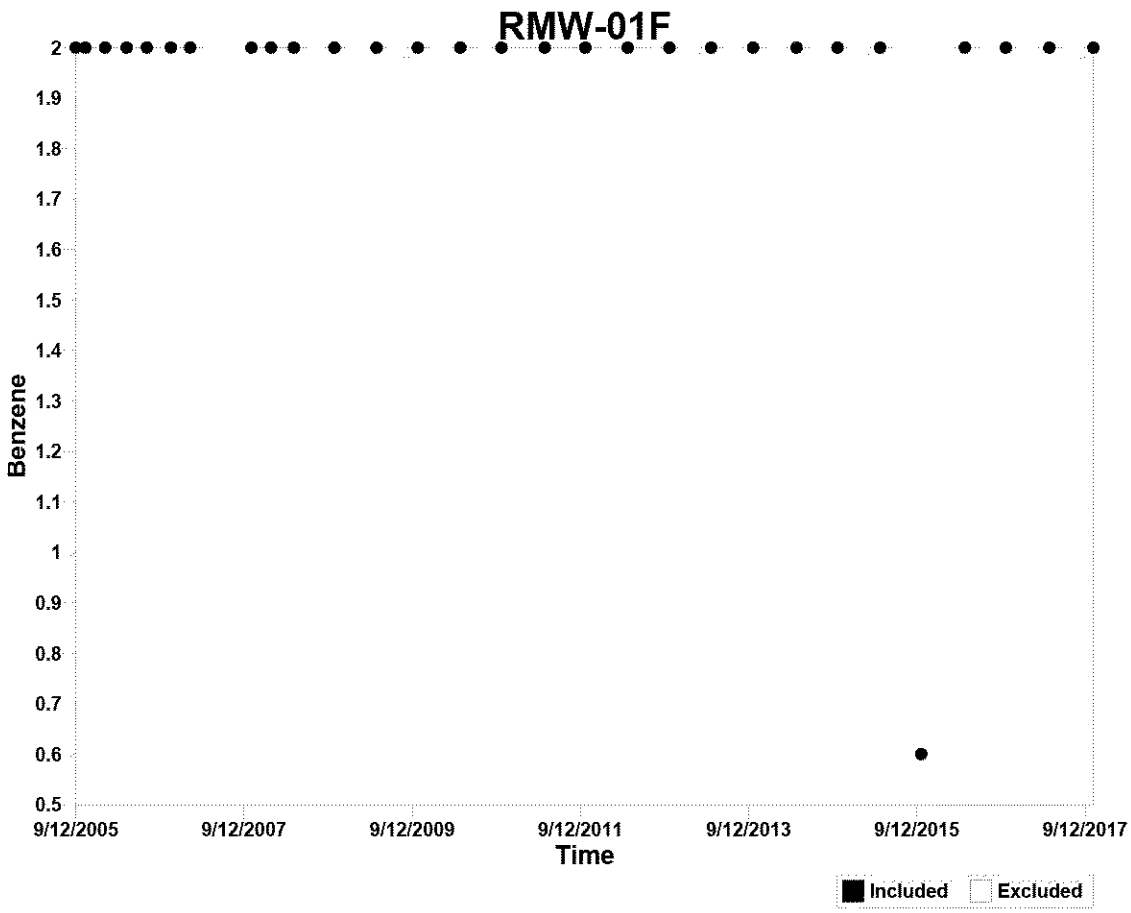
RMW-01D							
Time	Value		Time	Value		Time	Value
9/15/2005	2		10/9/2008	2		10/2/2013	2
10/24/2005	2		4/10/2009	2		4/8/2014	2
1/18/2006	2		10/6/2009	2		10/3/2014	2
4/21/2006	2		4/9/2010	2		4/6/2015	2
7/18/2006	2		10/5/2010	2		10/2/2015	2
10/30/2006	2		4/11/2011	2		4/8/2016	2
1/22/2007	2		10/5/2011	2		10/3/2016	2
10/15/2007	2		4/12/2012	2		4/10/2017	2
1/8/2008	2		10/3/2012	2		10/18/2017	2
4/16/2008	2		4/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-01E							
Time	Value		Time	Value		Time	Value
9/15/2005	2		10/9/2008	2		10/2/2013	2
10/24/2005	2		4/10/2009	2		4/8/2014	2
1/18/2006	2		10/6/2009	2		10/3/2014	2
4/21/2006	2		4/9/2010	2		4/6/2015	2
7/18/2006	2		10/5/2010	2		10/2/2015	2
10/30/2006	2		4/11/2011	2		4/8/2016	2
1/22/2007	2		10/5/2011	2		10/3/2016	2
10/15/2007	2		4/5/2012	2		4/10/2017	2
1/8/2008	2		10/3/2012	2		10/18/2017	2
4/16/2008	2		4/2/2013	2			

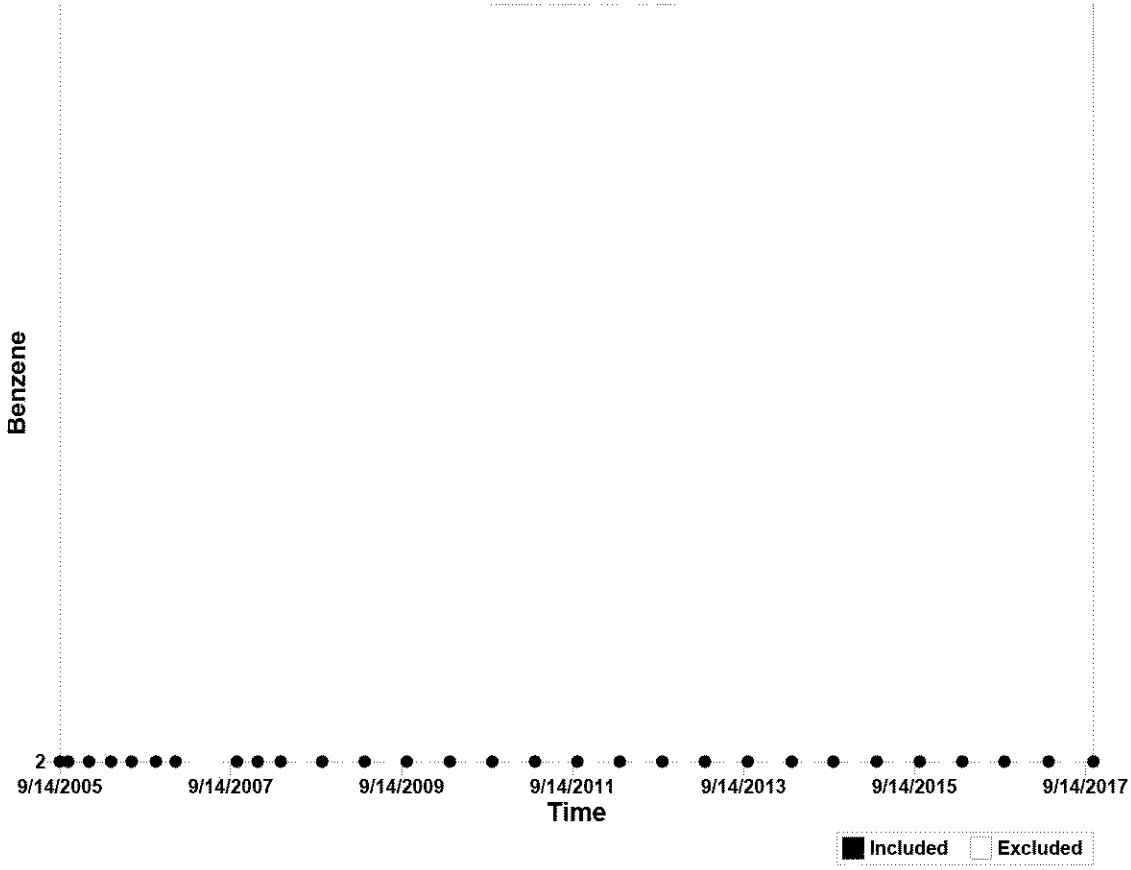
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-01F							
Time	Value		Time	Value		Time	Value
9/12/2005	2		10/9/2008	2		10/2/2013	2
10/24/2005	2		4/10/2009	2		4/8/2014	2
1/18/2006	2		10/6/2009	2		10/3/2014	2
4/21/2006	2		4/9/2010	2		4/6/2015	2
7/18/2006	2		10/5/2010	2		10/2/2015	0.6
10/30/2006	2		4/11/2011	2		4/8/2016	2
1/22/2007	2		10/4/2011	2		10/3/2016	2
10/15/2007	2		4/5/2012	2		4/10/2017	2
1/8/2008	2		10/3/2012	2		10/18/2017	2
4/16/2008	2		4/2/2013	2			

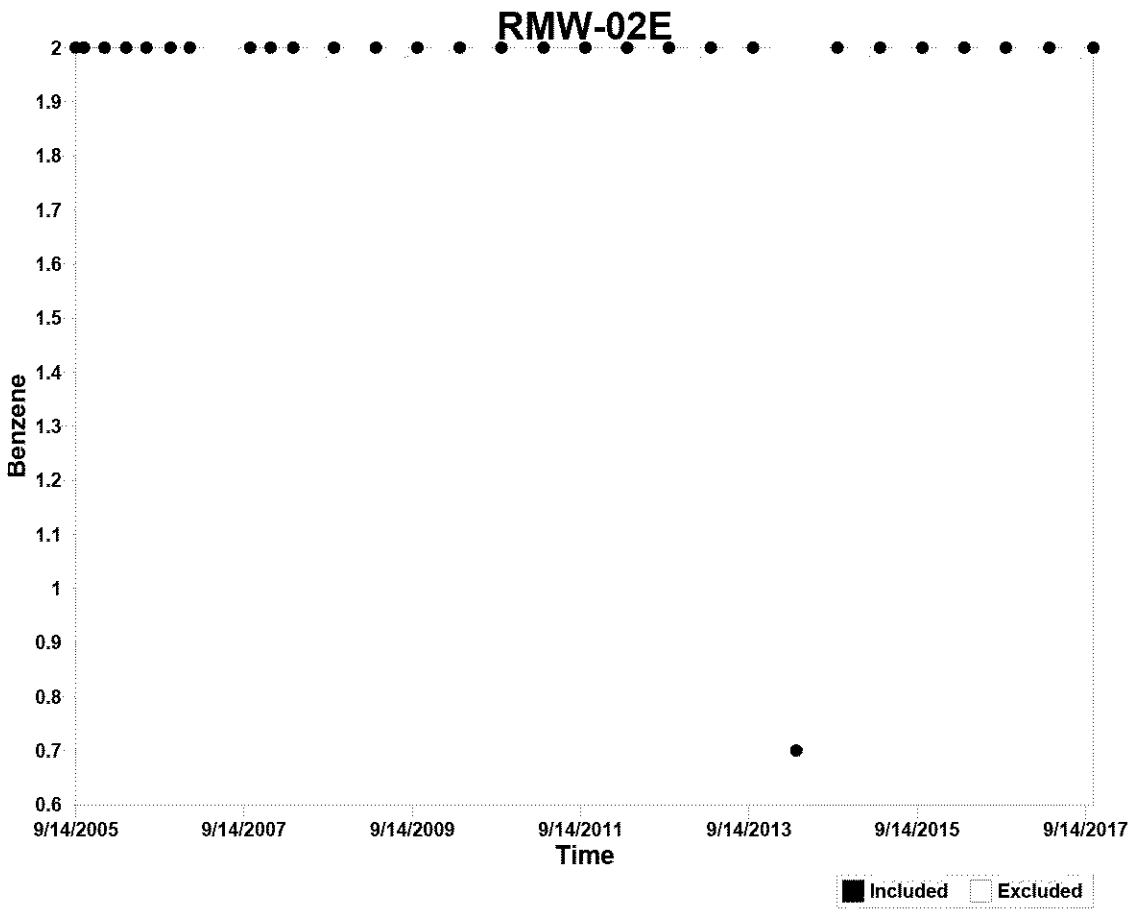
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-02D



RMW-02D							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		10/2/2013	2
10/20/2005	2		4/9/2009	2		4/8/2014	2
1/17/2006	2		10/6/2009	2		10/3/2014	2
4/21/2006	2		4/8/2010	2		4/6/2015	2
7/18/2006	2		10/6/2010	2		10/7/2015	2
10/30/2006	2		4/7/2011	2		4/6/2016	2
1/22/2007	2		10/5/2011	2		10/3/2016	2
10/11/2007	2		4/3/2012	2		4/10/2017	2
1/8/2008	2		10/2/2012	2		10/18/2017	2
4/15/2008	2		4/2/2013	2			

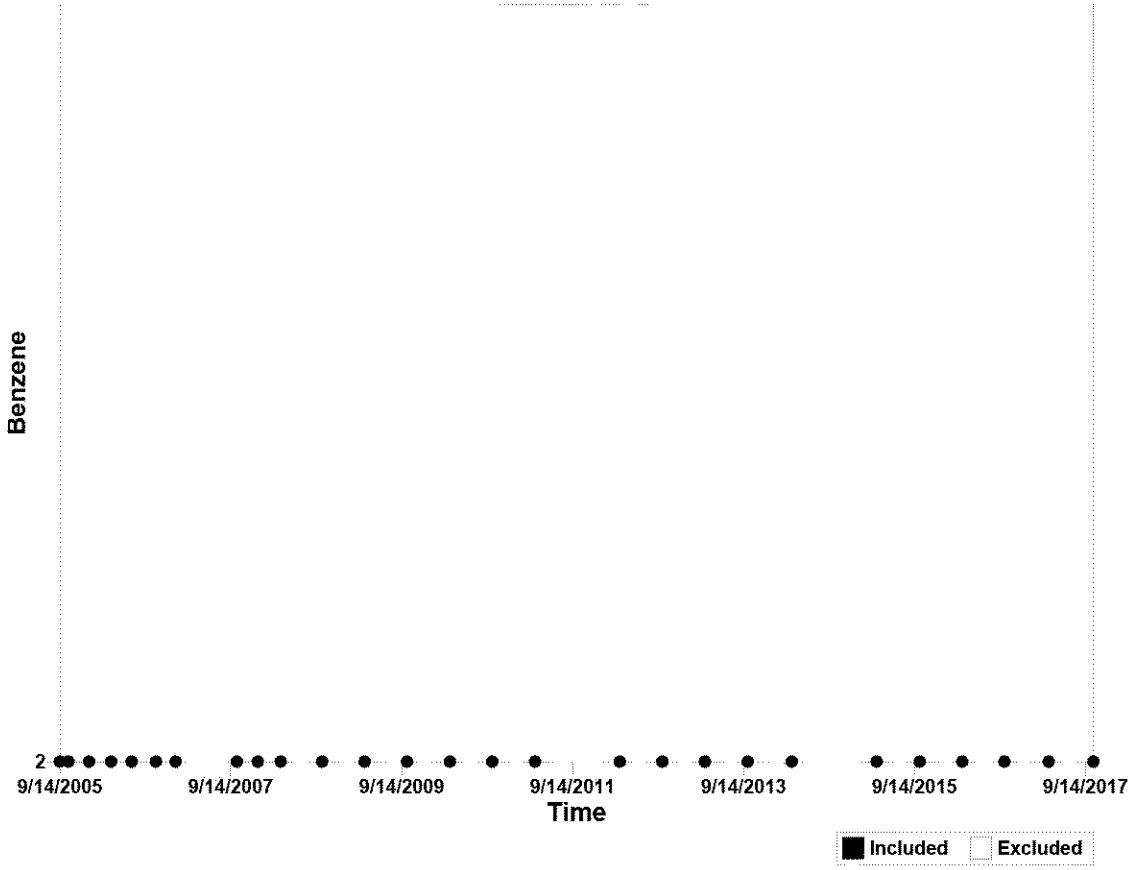
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-02E							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		10/2/2013	2
10/20/2005	2		4/9/2009	2		4/8/2014	0.7
1/17/2006	2		10/6/2009	2		10/3/2014	2
4/21/2006	2		4/8/2010	2		4/6/2015	2
7/18/2006	2		10/6/2010	2		10/7/2015	2
10/30/2006	2		4/7/2011	2		4/6/2016	2
1/22/2007	2		10/5/2011	2		10/3/2016	2
10/11/2007	2		4/3/2012	2		4/10/2017	2
1/8/2008	2		10/2/2012	2		10/18/2017	2
4/15/2008	2		4/2/2013	2			

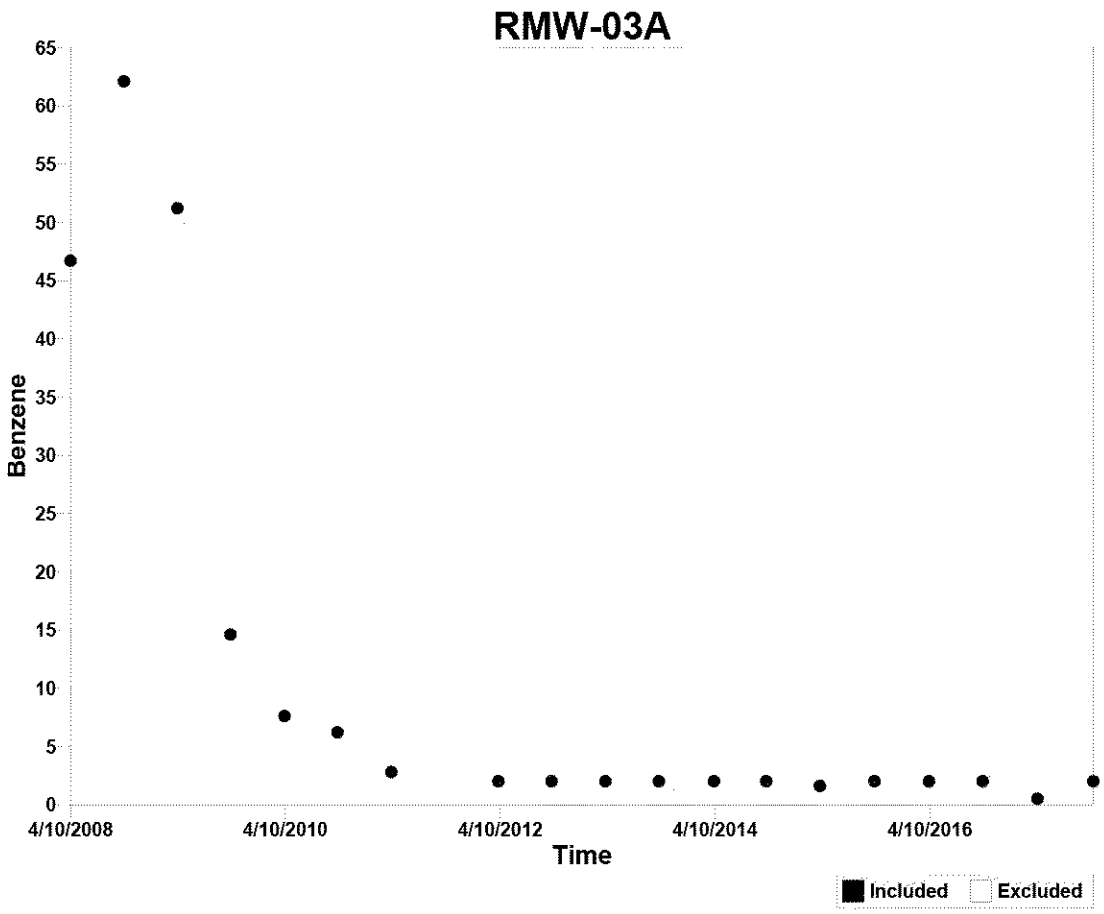
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-02F



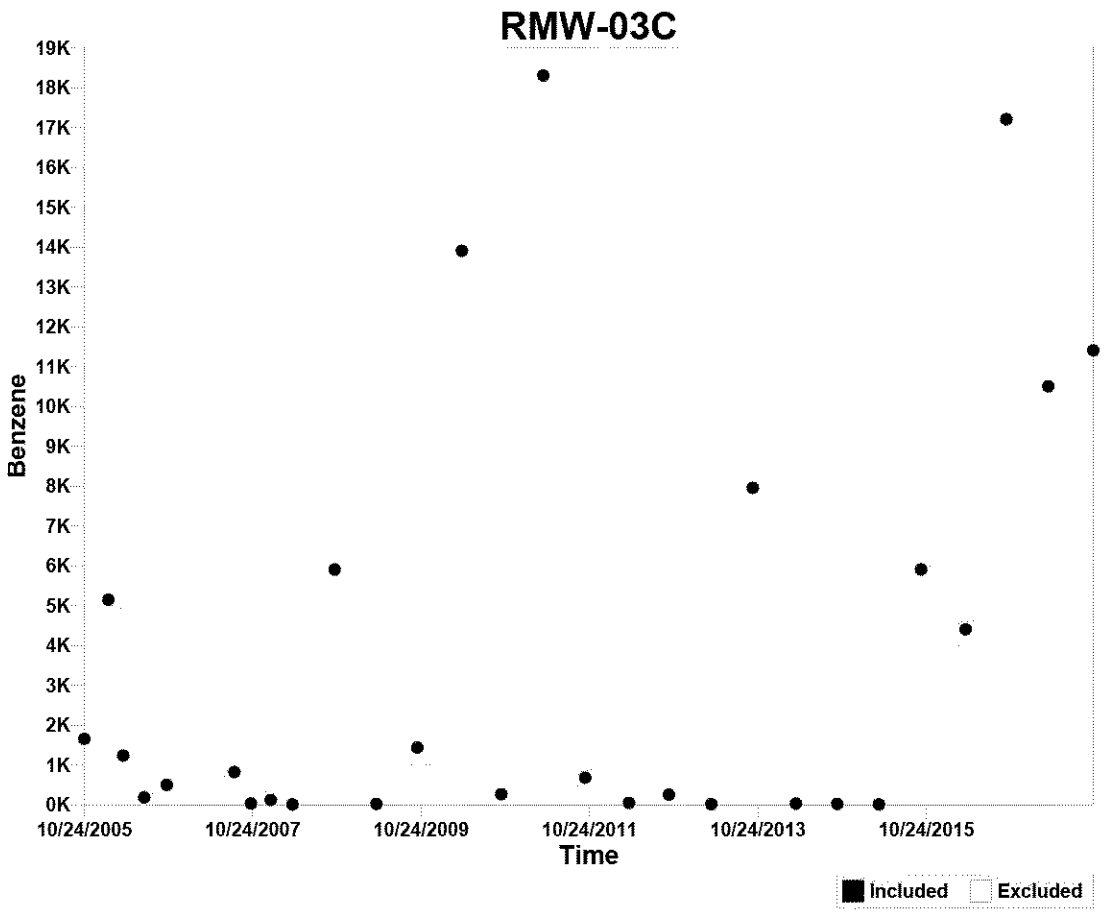
RMW-02F							
Time	Value		Time	Value		Time	Value
9/14/2005	2		4/15/2008	2		4/2/2013	2
10/21/2005	2		10/9/2008	2		10/2/2013	2
1/17/2006	2		4/9/2009	2		4/8/2014	2
4/21/2006	2		10/7/2009	2		4/6/2015	2
7/18/2006	2		4/8/2010	2		10/7/2015	2
10/30/2006	2		10/6/2010	2		4/6/2016	2
1/22/2007	2		4/7/2011	2		10/3/2016	2
10/11/2007	2		4/3/2012	2		4/10/2017	2
1/8/2008	2		10/2/2012	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



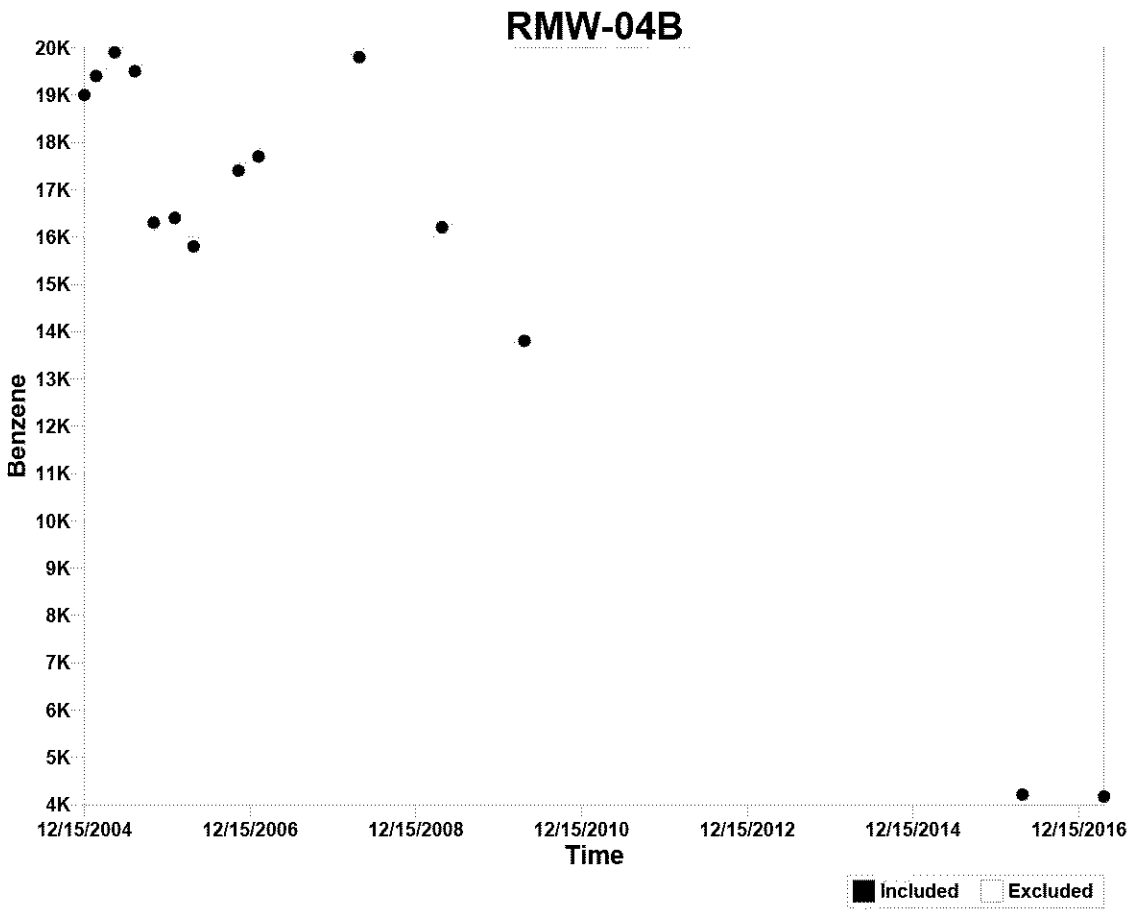
RMW-03A							
Time	Value		Time	Value		Time	Value
4/10/2008	46.7		4/4/2012	2		10/5/2015	2
10/9/2008	62.1		10/2/2012	2		4/7/2016	2
4/9/2009	51.2		4/3/2013	2		10/7/2016	2
10/6/2009	14.6		10/2/2013	2		4/11/2017	0.5
4/8/2010	7.6		4/7/2014	2		10/18/2017	2
10/5/2010	6.2		10/2/2014	2			
4/6/2011	2.8		4/2/2015	1.6			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



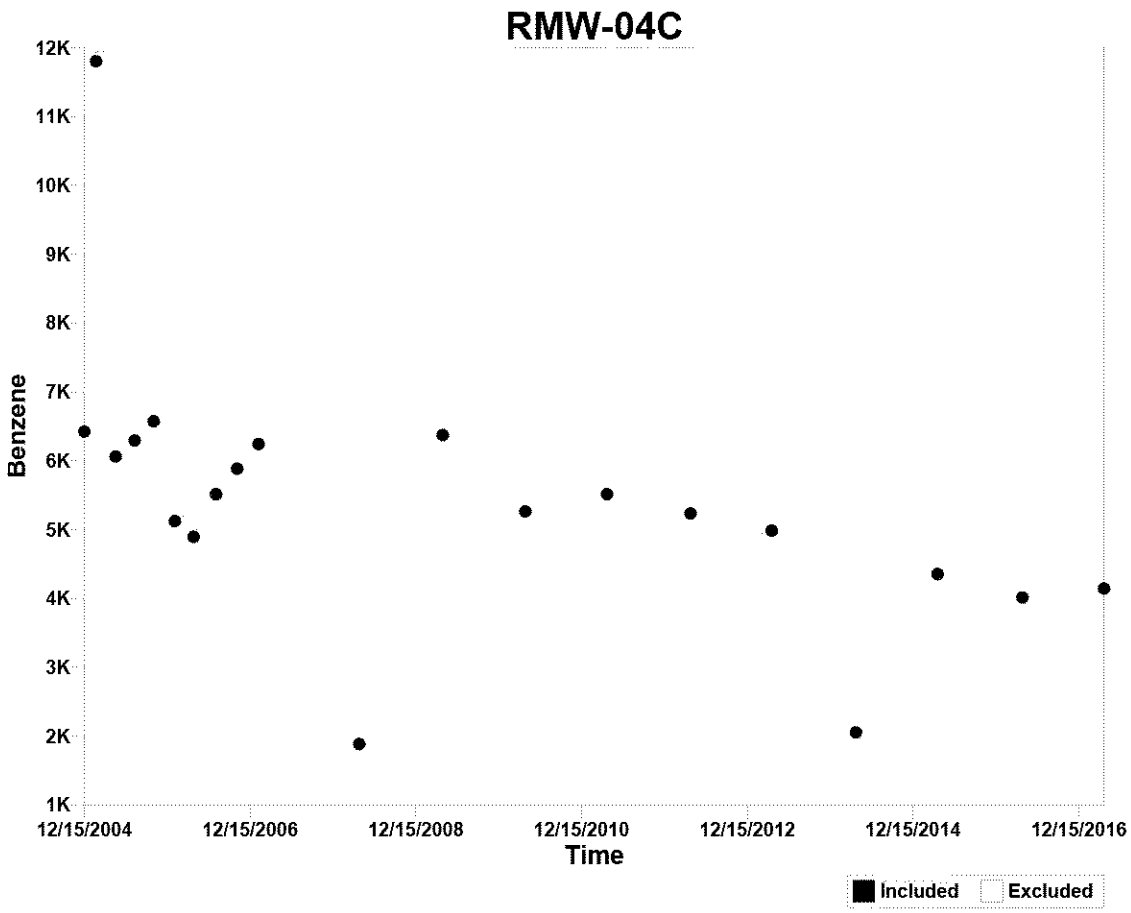
RMW-03C							
Time	Value		Time	Value		Time	Value
10/24/2005	1650		4/13/2009	18		4/7/2014	23.4
2/6/2006	5140		10/8/2009	1430		10/3/2014	14.7
4/11/2006	1230		4/19/2010	13900		4/2/2015	4.8
7/11/2006	179		10/7/2010	259		10/2/2015	5900
10/17/2006	493		4/7/2011	18300		4/12/2016	4400
8/6/2007	815		10/6/2011	676		10/6/2016	17200
10/17/2007	26.8		4/13/2012	42.1		4/5/2017	10500
1/11/2008	115		10/3/2012	247		10/18/2017	11400
4/14/2008	2		4/5/2013	11.3			
10/14/2008	5900		10/2/2013	7950			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



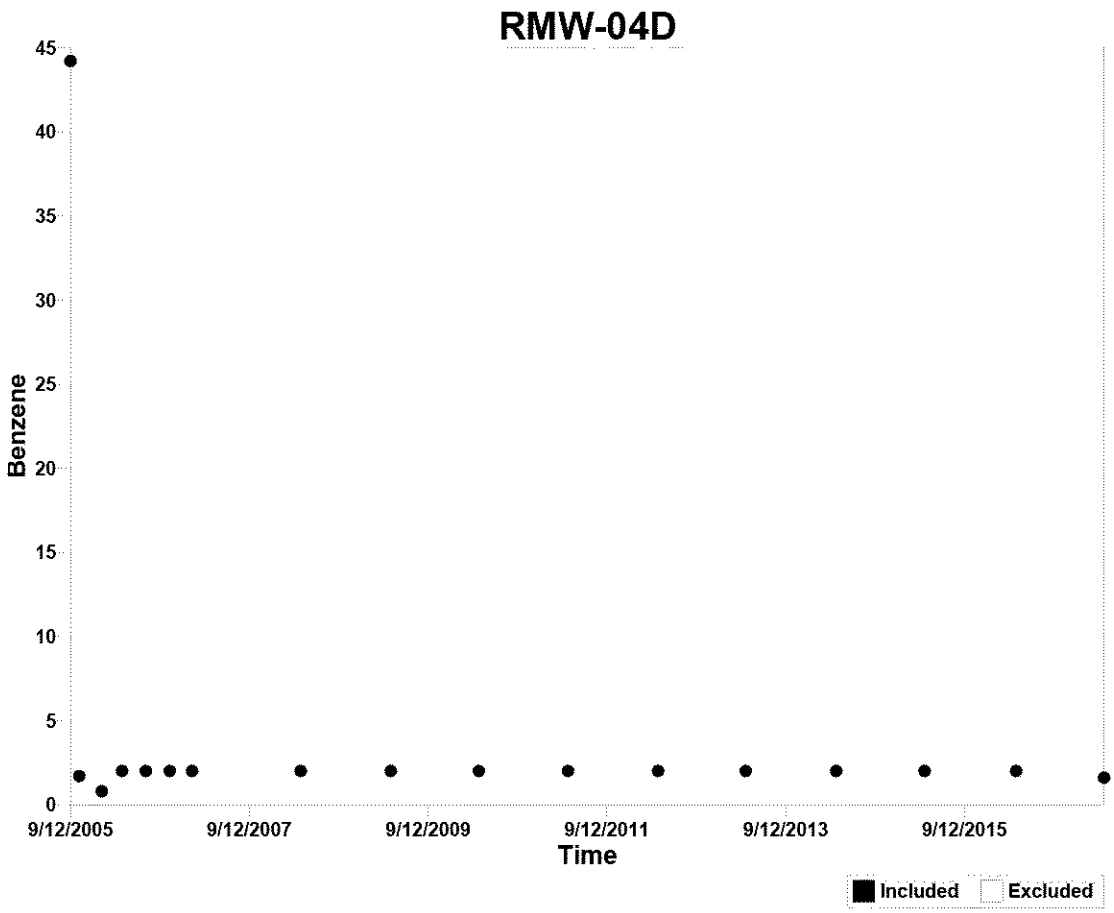
RMW-04B							
Time	Value		Time	Value		Time	Value
12/15/2004	19000		1/18/2006	16400		4/10/2009	16200
2/5/2005	19400		4/11/2006	15800		4/8/2010	13800
4/28/2005	19900		10/26/2006	17400		4/11/2016	4210
7/26/2005	19500		1/22/2007	17700		4/5/2017	4170
10/17/2005	16300		4/10/2008	19800			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-04C							
Time	Value		Time	Value		Time	Value
12/15/2004	6420		7/19/2006	5510		4/9/2012	5230
2/5/2005	11800		10/20/2006	5880		4/2/2013	4980
5/2/2005	6060		1/22/2007	6240		4/8/2014	2050
7/25/2005	6290		4/10/2008	1880		4/3/2015	4350
10/17/2005	6570		4/13/2009	6370		4/11/2016	4010
1/18/2006	5120		4/12/2010	5260		4/5/2017	4140
4/11/2006	4890		4/7/2011	5510			

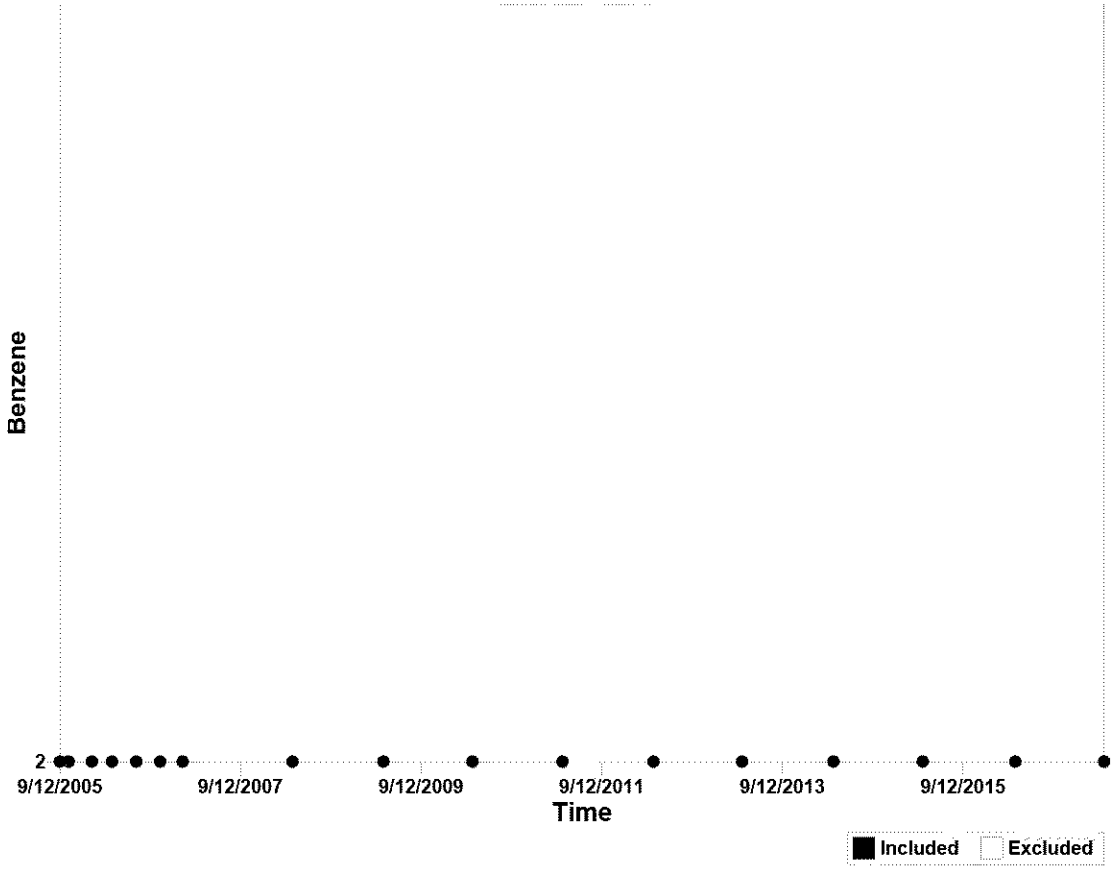
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-04D							
Time	Value		Time	Value		Time	Value
9/12/2005	44.2		1/22/2007	2		4/2/2013	2
10/18/2005	1.7		4/10/2008	2		4/7/2014	2
1/18/2006	0.8		4/13/2009	2		4/3/2015	2
4/11/2006	2		4/8/2010	2		4/11/2016	2
7/17/2006	2		4/7/2011	2		4/5/2017	1.6
10/23/2006	2		4/9/2012	2			

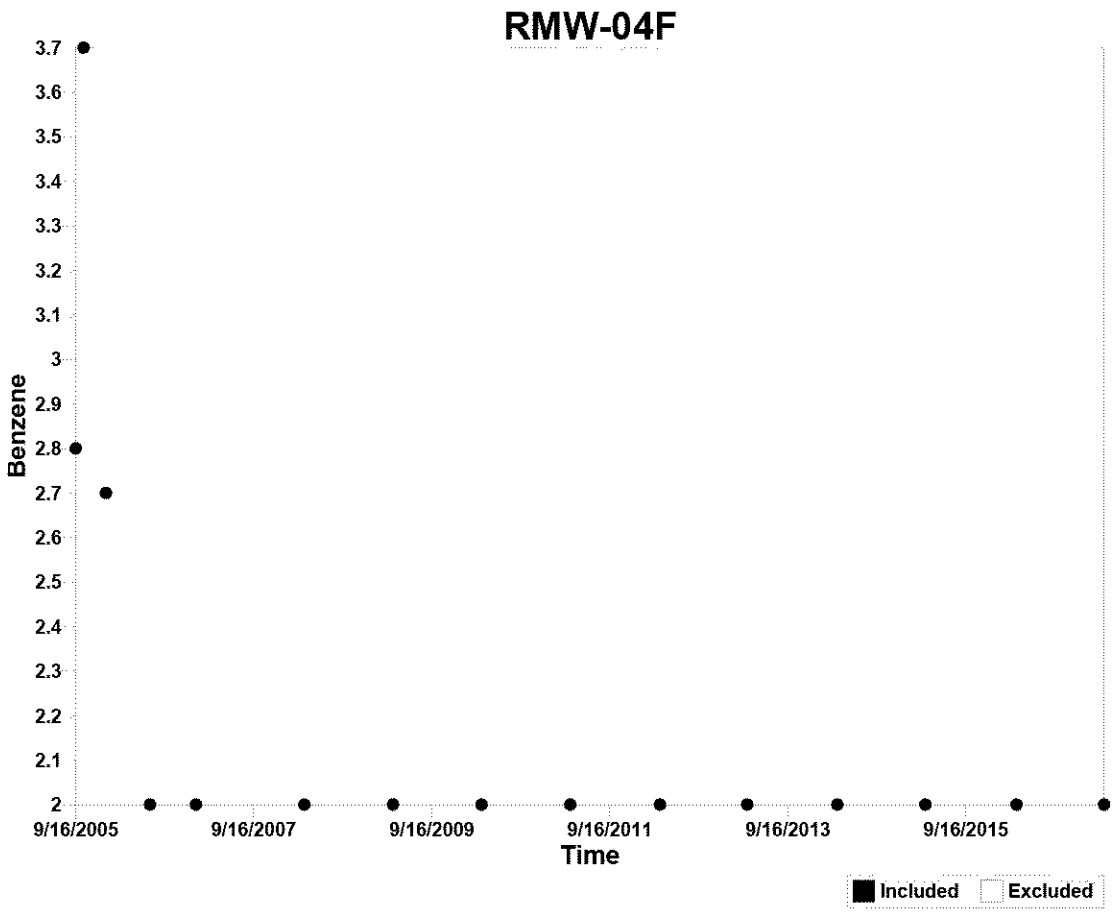
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-04E



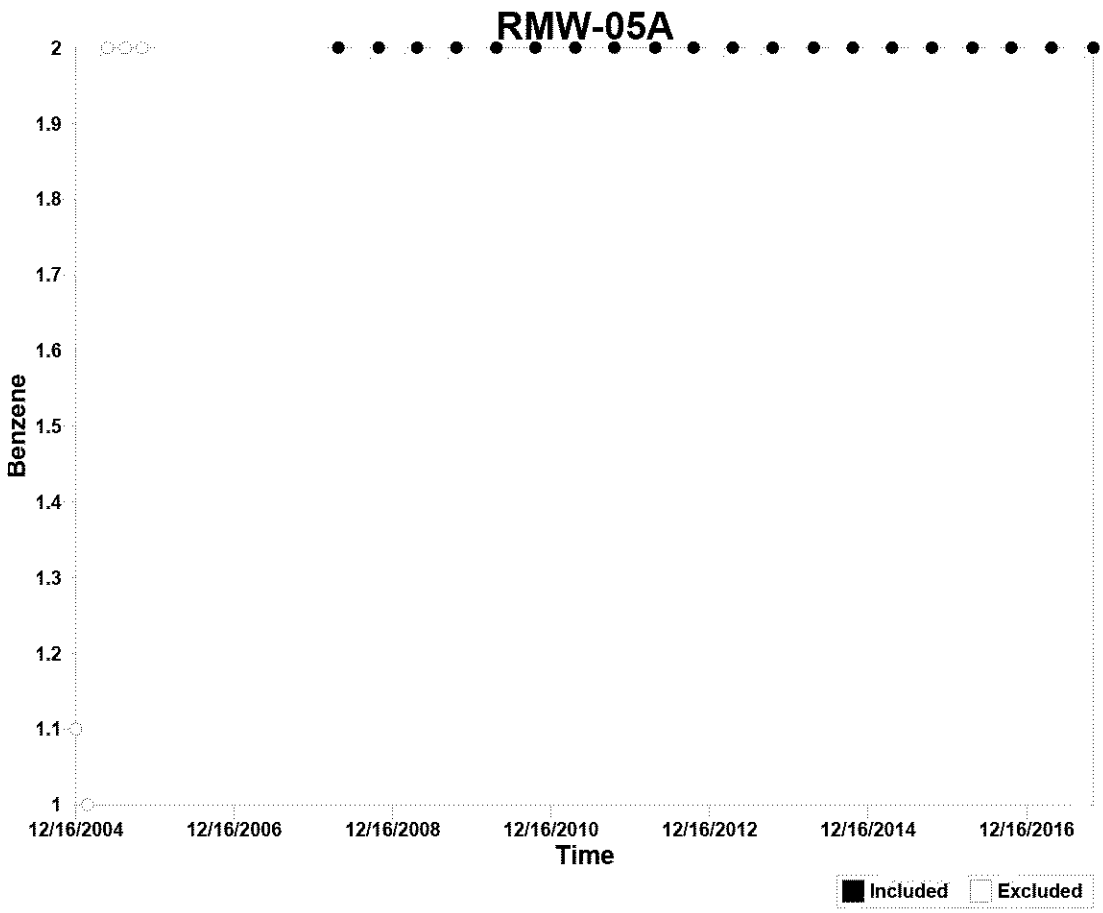
RMW-04E							
Time	Value		Time	Value		Time	Value
9/12/2005	2		1/22/2007	2		4/2/2013	2
10/18/2005	2		4/10/2008	2		4/7/2014	2
1/20/2006	2		4/13/2009	2		4/3/2015	2
4/11/2006	2		4/8/2010	2		4/11/2016	2
7/18/2006	2		4/7/2011	2		4/5/2017	2
10/23/2006	2		4/9/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



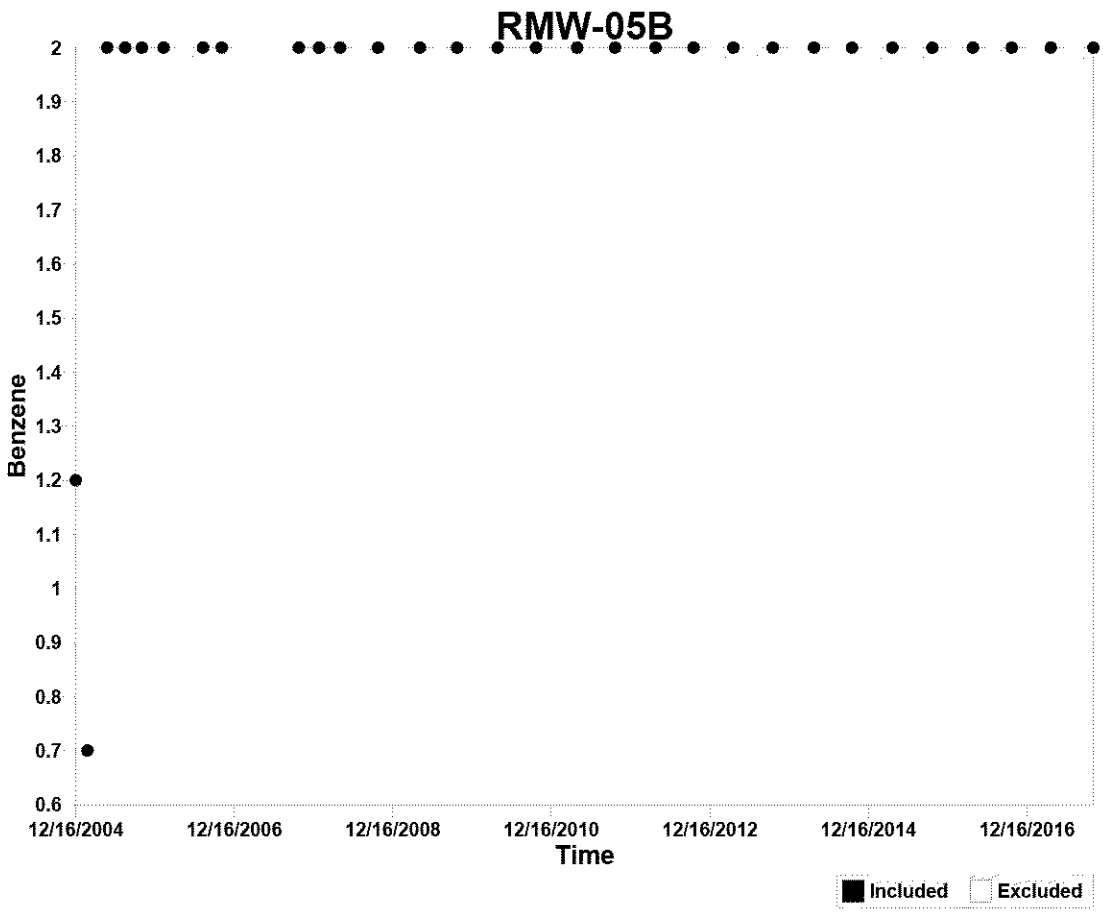
RMW-04F							
Time	Value		Time	Value		Time	Value
9/16/2005	2.8		4/11/2008	2		4/2/2013	2
10/18/2005	3.7		4/10/2009	2		4/7/2014	2
1/18/2006	2.7		4/8/2010	2		4/3/2015	2
7/18/2006	2		4/7/2011	2		4/11/2016	2
1/22/2007	2		4/9/2012	2		4/5/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



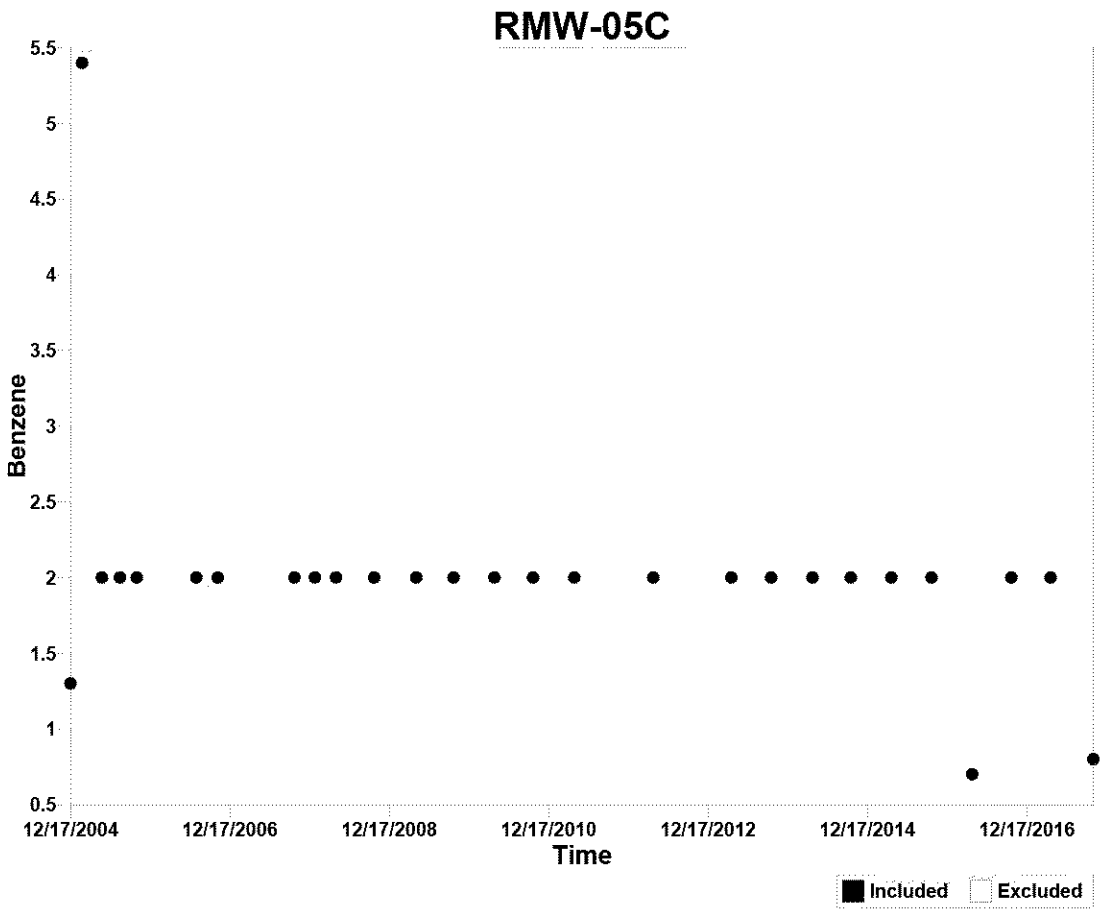
RMW-05A							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
12/16/2004	*1.1*		4/8/2010	2		10/7/2014	2
2/8/2005	*1*		10/5/2010	2		4/6/2015	2
5/10/2005	*2*		4/7/2011	2		10/7/2015	2
8/1/2005	*2*		10/4/2011	2		4/11/2016	2
10/17/2005	*2*		4/10/2012	2		10/7/2016	2
4/10/2008	2		10/3/2012	2		4/10/2017	2
10/13/2008	2		4/2/2013	2		10/20/2017	2
4/8/2009	2		10/3/2013	2			
10/6/2009	2		4/10/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



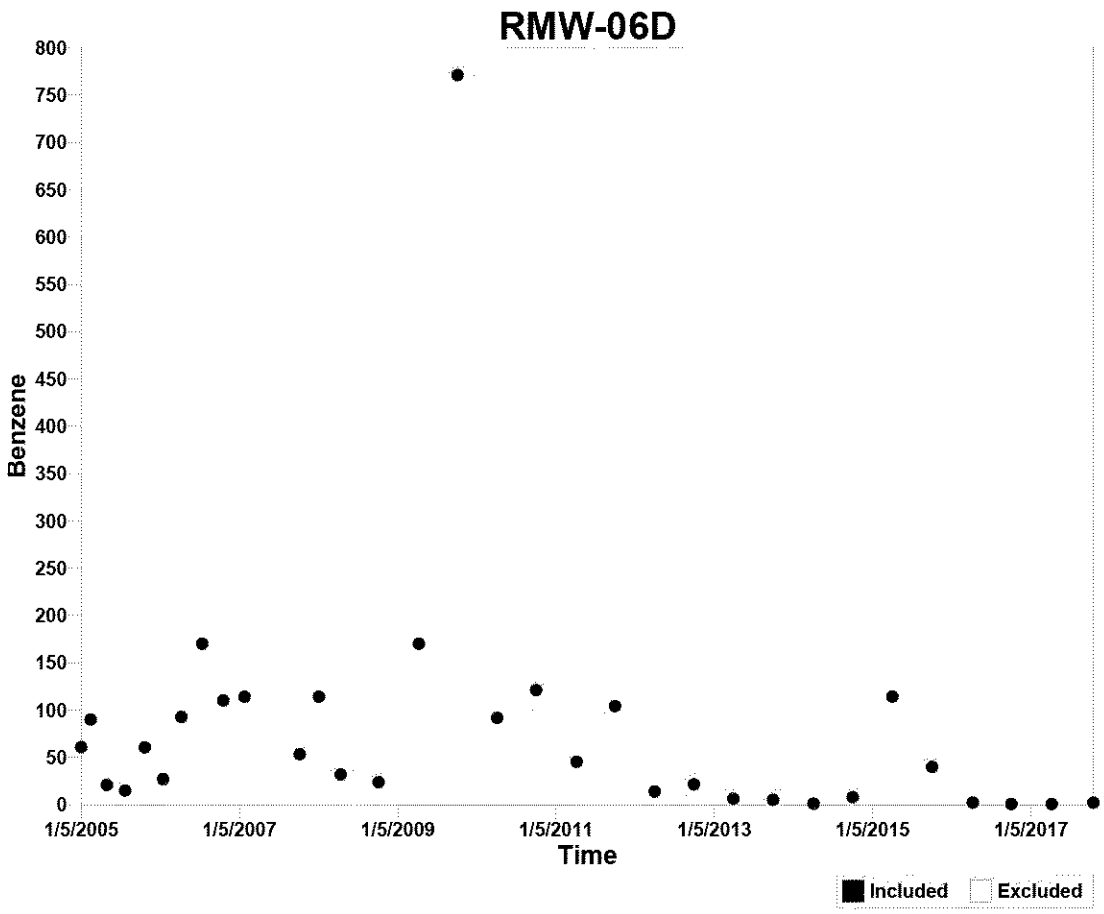
RMW-05B							
Time	Value		Time	Value		Time	Value
12/16/2004	1.2		4/17/2008	2		4/3/2013	2
2/8/2005	0.7		10/9/2008	2		10/2/2013	2
5/10/2005	2		4/20/2009	2		4/10/2014	2
8/1/2005	2		10/8/2009	2		10/2/2014	2
10/17/2005	2		4/13/2010	2		4/6/2015	2
1/25/2006	2		10/7/2010	2		10/7/2015	2
7/26/2006	2		4/14/2011	2		4/11/2016	2
10/20/2006	2		10/6/2011	2		10/7/2016	2
10/10/2007	2		4/10/2012	2		4/5/2017	2
1/11/2008	2		10/2/2012	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



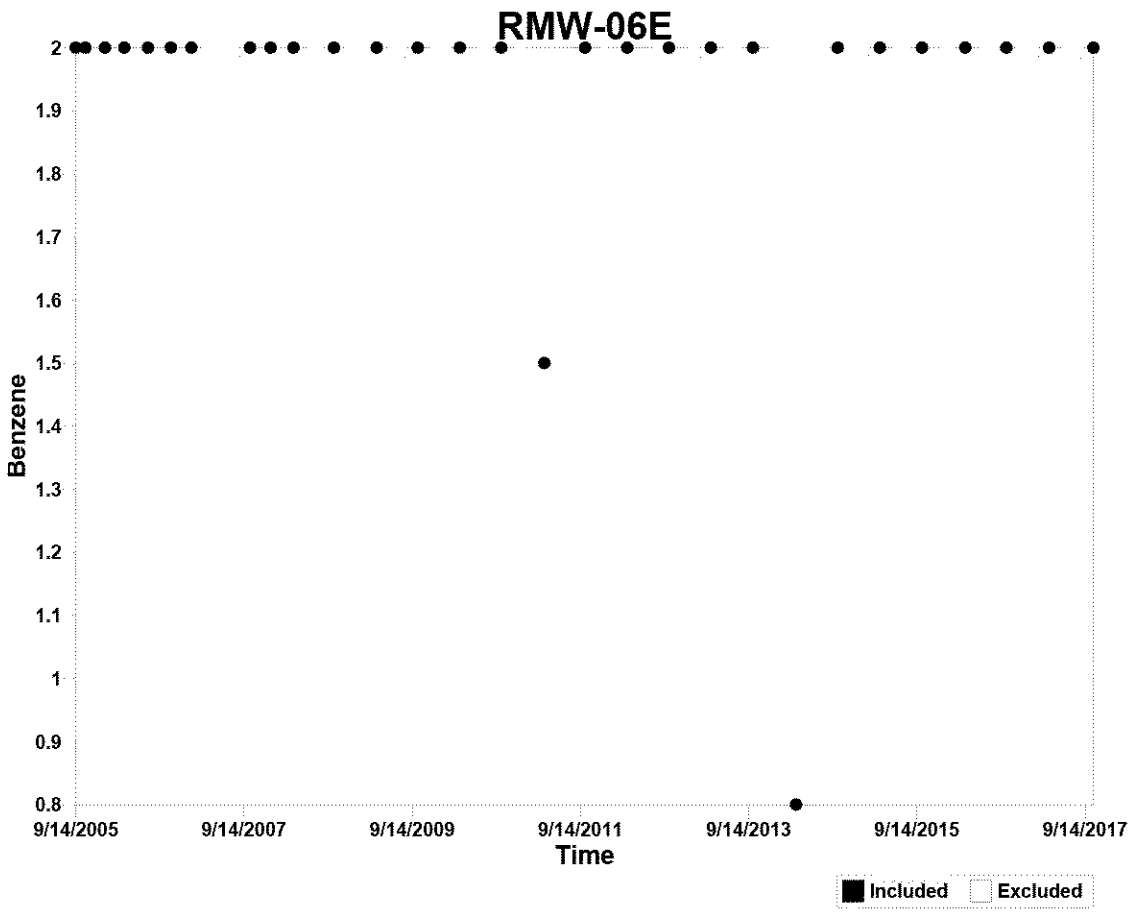
RMW-05C							
Time	Value		Time	Value		Time	Value
12/17/2004	1.3		4/17/2008	2		10/2/2013	2
2/8/2005	5.4		10/9/2008	2		4/10/2014	2
5/10/2005	2		4/20/2009	2		10/2/2014	2
8/1/2005	2		10/8/2009	2		4/6/2015	2
10/17/2005	2		4/13/2010	2		10/7/2015	2
7/17/2006	2		10/7/2010	2		4/11/2016	0.7
10/23/2006	2		4/14/2011	2		10/7/2016	2
10/10/2007	2		4/10/2012	2		4/5/2017	2
1/11/2008	2		4/3/2013	2		10/18/2017	0.8

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



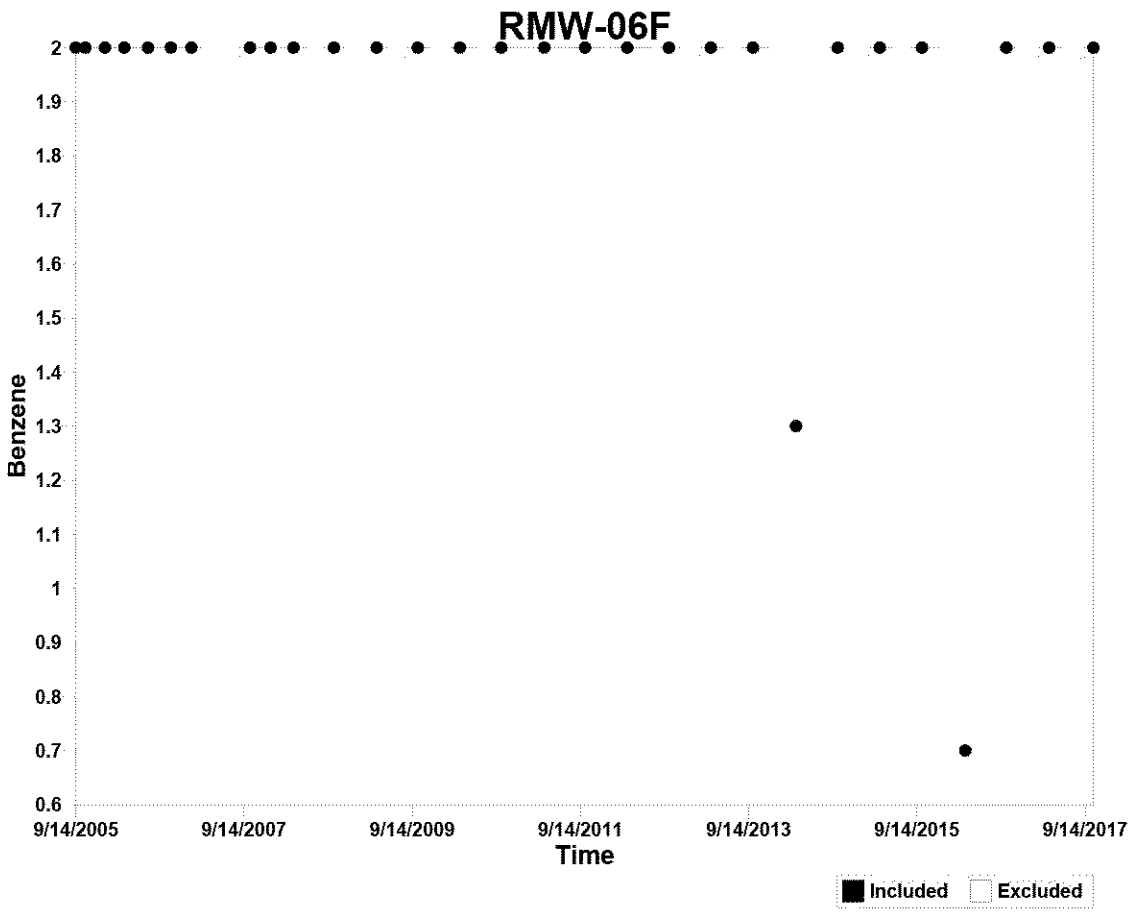
RMW-06D							
Time	Value		Time	Value		Time	Value
1/5/2005	60.8		1/8/2008	114		4/3/2013	6.2
2/18/2005	89.9		4/17/2008	31.9		10/3/2013	5.1
5/4/2005	20.7		10/9/2008	23.7		4/8/2014	0.9
7/27/2005	14.8		4/13/2009	170		10/6/2014	7.8
10/26/2005	60.4		10/8/2009	771		4/7/2015	114
1/19/2006	26.8		4/9/2010	91.6		10/7/2015	39.8
4/13/2006	92.6		10/6/2010	121		4/12/2016	2
7/18/2006	170		4/11/2011	45.2		10/7/2016	0.5
10/23/2006	110		10/5/2011	104		4/11/2017	0.5
1/29/2007	114		4/5/2012	13.7		10/20/2017	2
10/11/2007	53.2		10/3/2012	21.4			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



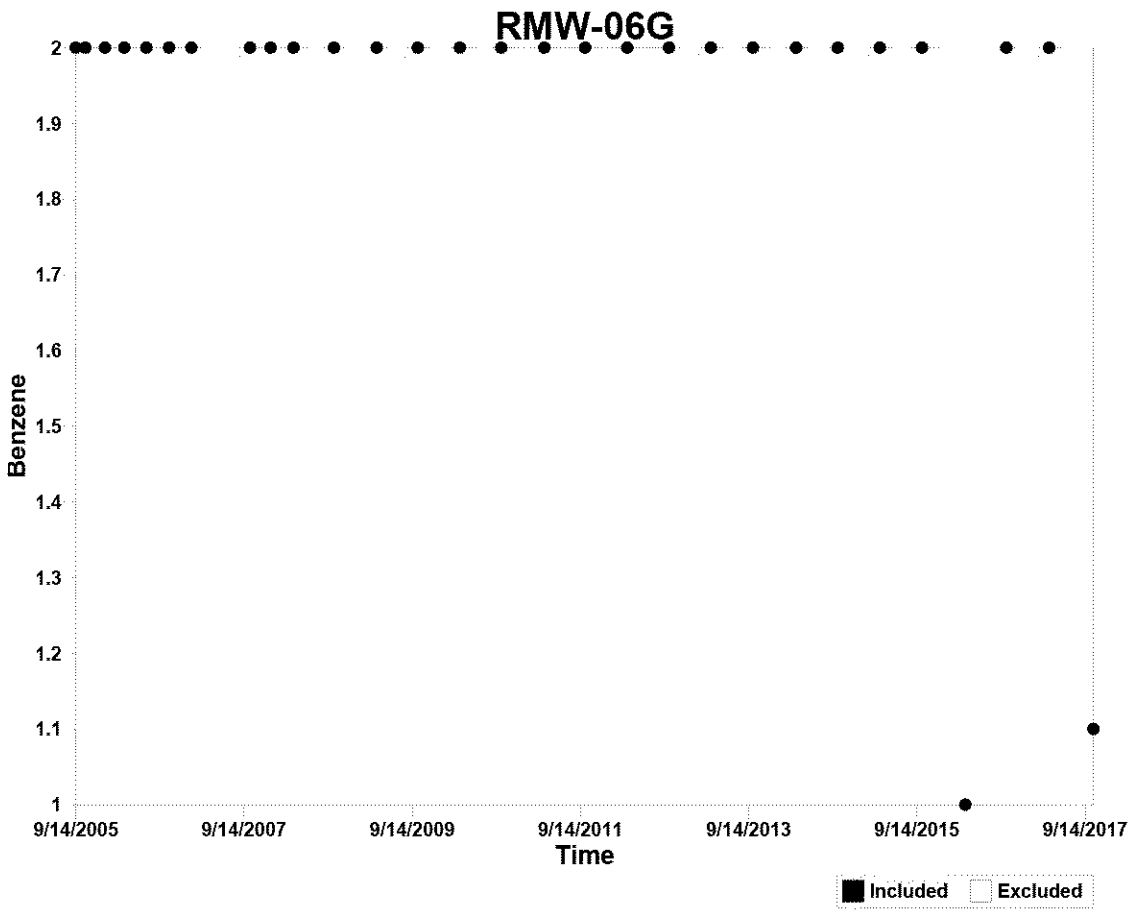
RMW-06E							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		10/3/2013	2
10/26/2005	2		4/13/2009	2		4/8/2014	0.8
1/19/2006	2		10/8/2009	2		10/6/2014	2
4/13/2006	2		4/9/2010	2		4/7/2015	2
7/25/2006	2		10/6/2010	2		10/7/2015	2
11/1/2006	2		4/11/2011	1.5		4/12/2016	2
1/29/2007	2		10/5/2011	2		10/7/2016	2
10/11/2007	2		4/5/2012	2		4/11/2017	2
1/8/2008	2		10/3/2012	2		10/20/2017	2
4/17/2008	2		4/3/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



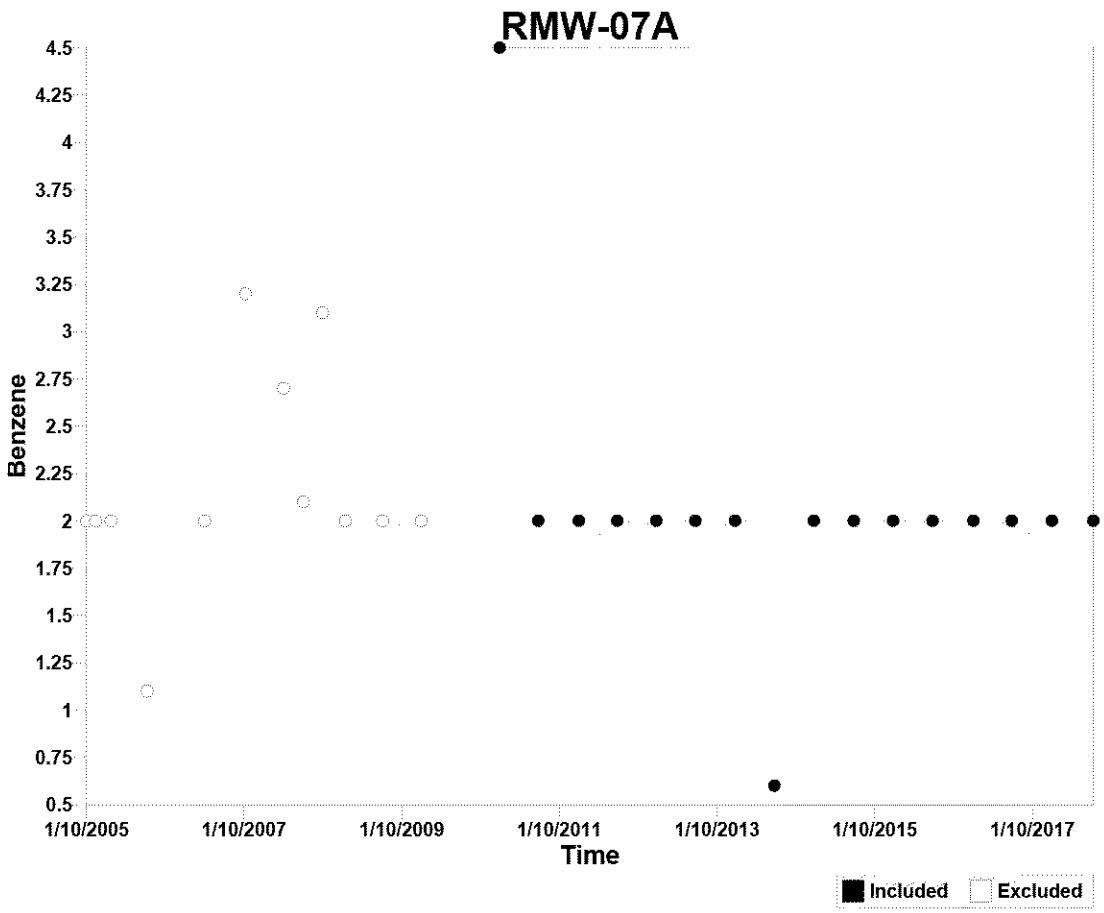
RMW-06F							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		10/3/2013	2
10/26/2005	2		4/13/2009	2		4/8/2014	1.3
1/19/2006	2		10/8/2009	2		10/6/2014	2
4/13/2006	2		4/9/2010	2		4/7/2015	2
7/25/2006	2		10/6/2010	2		10/7/2015	2
11/1/2006	2		4/11/2011	2		4/12/2016	0.7
1/29/2007	2		10/5/2011	2		10/7/2016	2
10/11/2007	2		4/5/2012	2		4/11/2017	2
1/8/2008	2		10/3/2012	2		10/20/2017	2
4/17/2008	2		4/3/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



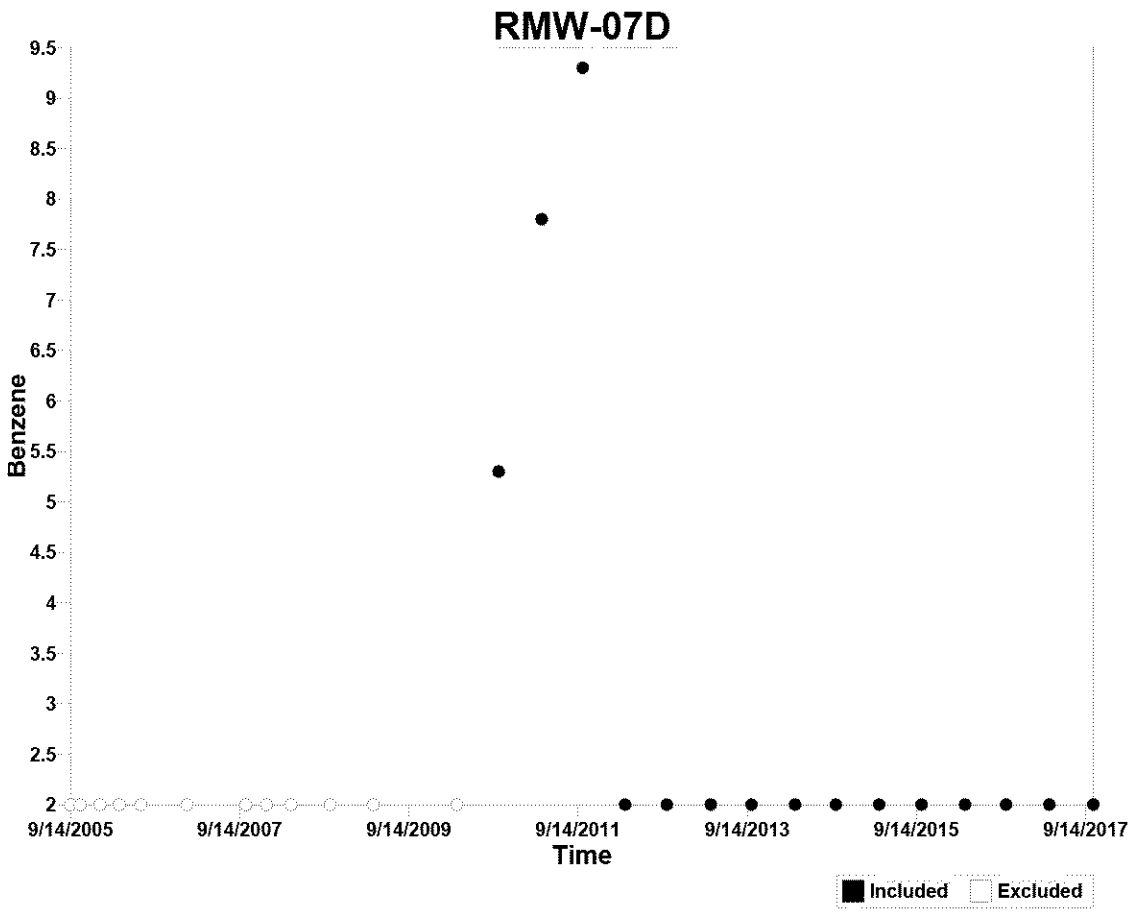
RMW-06G							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		10/3/2013	2
10/26/2005	2		4/13/2009	2		4/8/2014	2
1/19/2006	2		10/8/2009	2		10/6/2014	2
4/13/2006	2		4/9/2010	2		4/7/2015	2
7/18/2006	2		10/6/2010	2		10/7/2015	2
10/24/2006	2		4/11/2011	2		4/12/2016	1
1/29/2007	2		10/5/2011	2		10/7/2016	2
10/11/2007	2		4/5/2012	2		4/11/2017	2
1/8/2008	2		10/3/2012	2		10/20/2017	1.1
4/17/2008	2		4/3/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-07A							
Time	Value		Time	Value		Time	Value
1/10/2005	2		10/13/2008	2		4/4/2014	2
2/21/2005	2		4/10/2009	2		10/6/2014	2
5/3/2005	2		4/9/2010	4.5		4/6/2015	2
10/18/2005	1.1		10/5/2010	2		10/6/2015	2
7/12/2006	2		4/11/2011	2		4/12/2016	2
1/18/2007	3.2		10/6/2011	2		10/7/2016	2
7/13/2007	2.7		4/4/2012	2		4/11/2017	2
10/11/2007	2.1		10/2/2012	2		10/20/2017	2
1/9/2008	3.1		4/4/2013	2			
4/23/2008	2		10/3/2013	0.6			

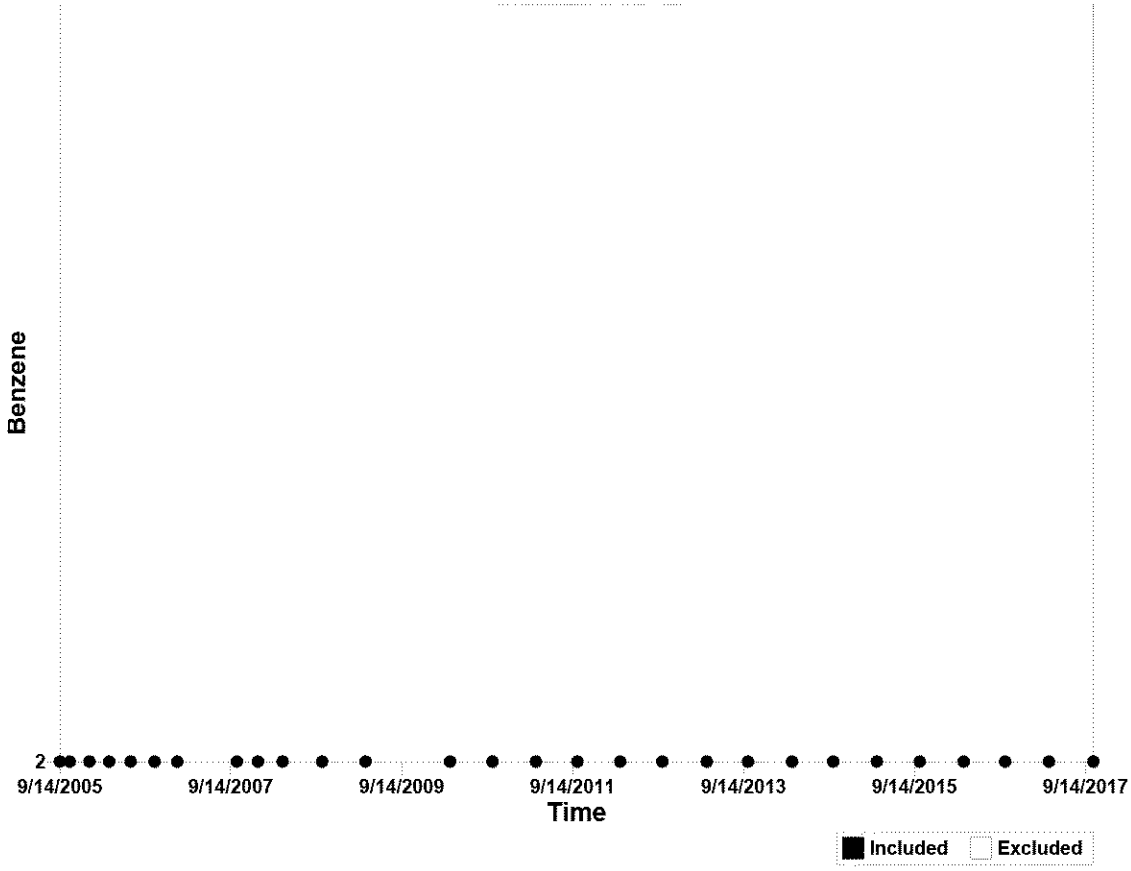
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-07D							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		10/3/2013	2
10/26/2005	2		4/13/2009	2		4/9/2014	2
1/19/2006	2		4/9/2010	2		10/2/2014	2
4/13/2006	2		10/7/2010	5.3		4/7/2015	2
7/14/2006	2		4/11/2011	7.8		10/7/2015	2
1/29/2007	2		10/5/2011	9.3		4/12/2016	2
10/11/2007	2		4/5/2012	2		10/6/2016	2
1/8/2008	2		10/2/2012	2		4/11/2017	2
4/23/2008	2		4/10/2013	2		10/18/2017	2

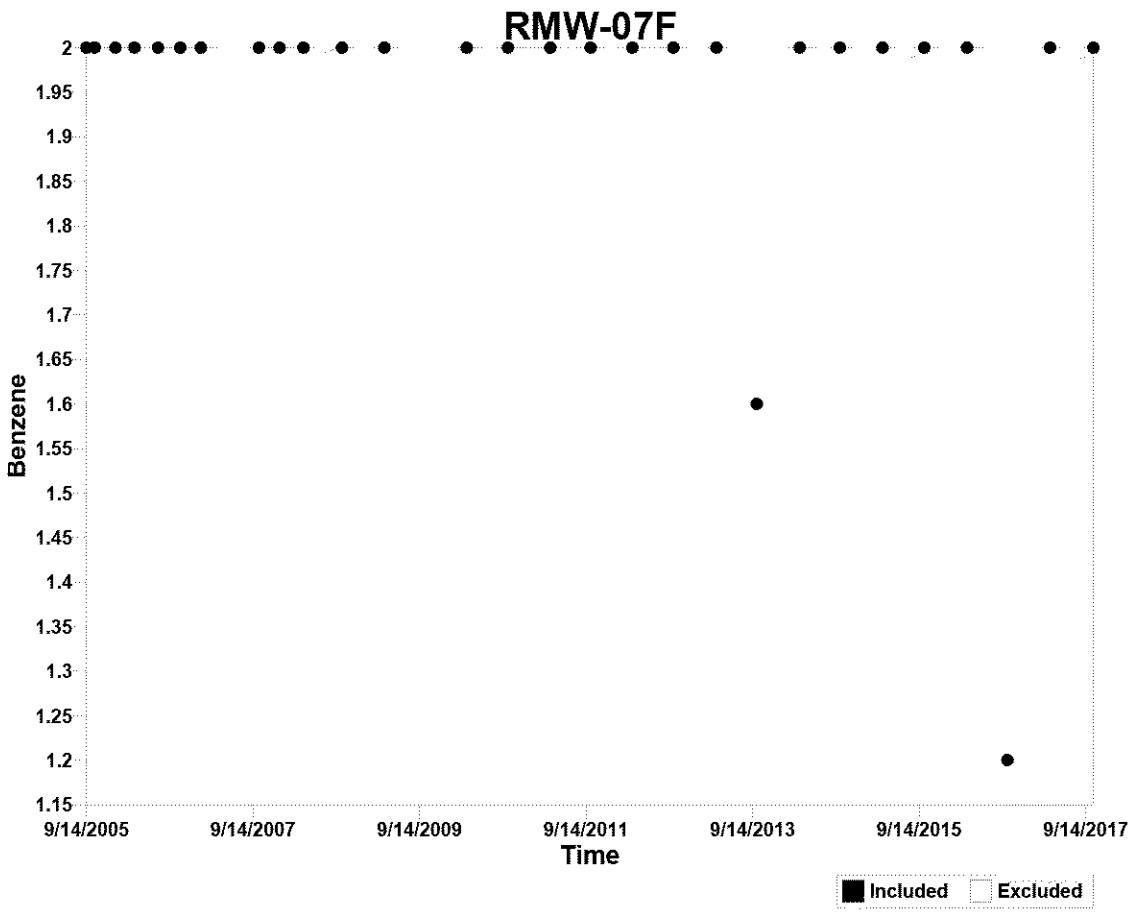
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-07E



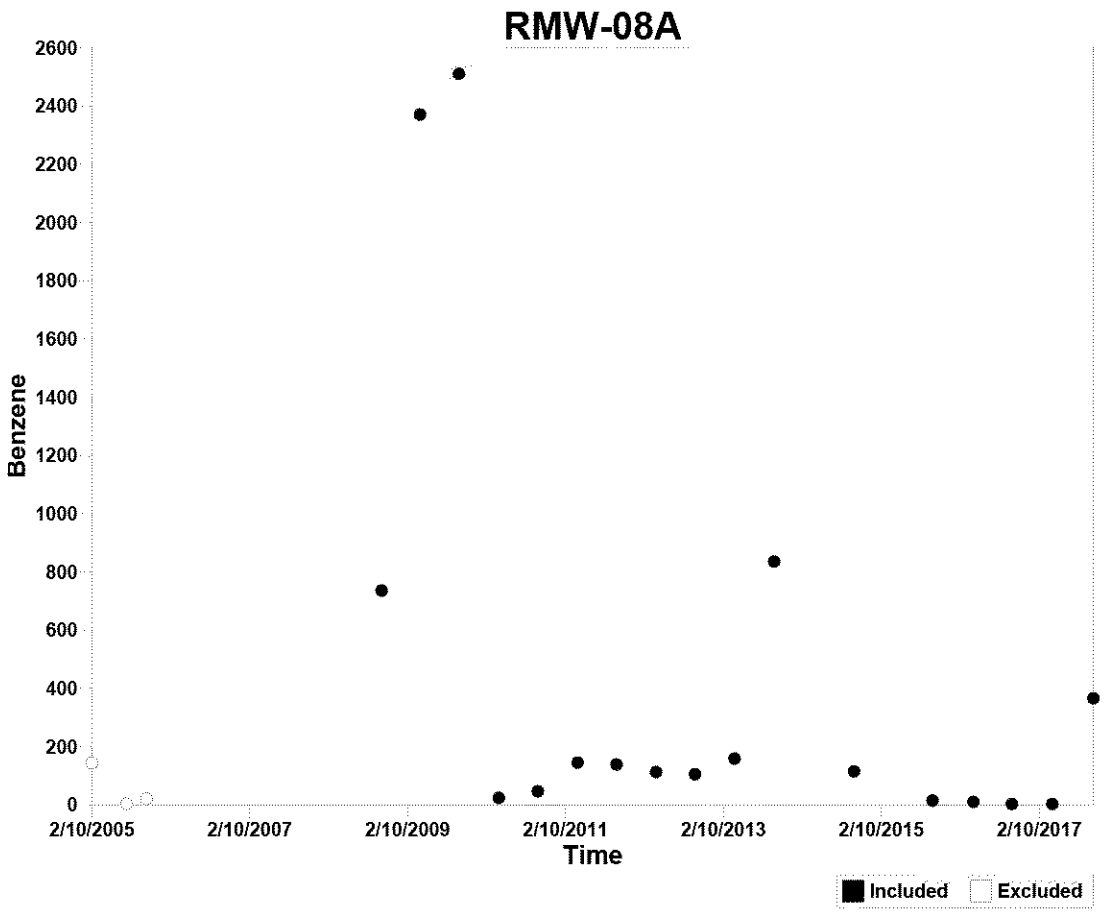
RMW-07E							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		4/9/2014	2
10/26/2005	2		4/13/2009	2		10/2/2014	2
1/19/2006	2		4/9/2010	2		4/7/2015	2
4/13/2006	2		10/7/2010	2		10/7/2015	2
7/14/2006	2		4/11/2011	2		4/12/2016	2
10/24/2006	2		10/5/2011	2		10/6/2016	2
1/29/2007	2		4/5/2012	2		4/11/2017	2
10/11/2007	2		10/2/2012	2		10/18/2017	2
1/9/2008	2		4/10/2013	2			
4/23/2008	2		10/3/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



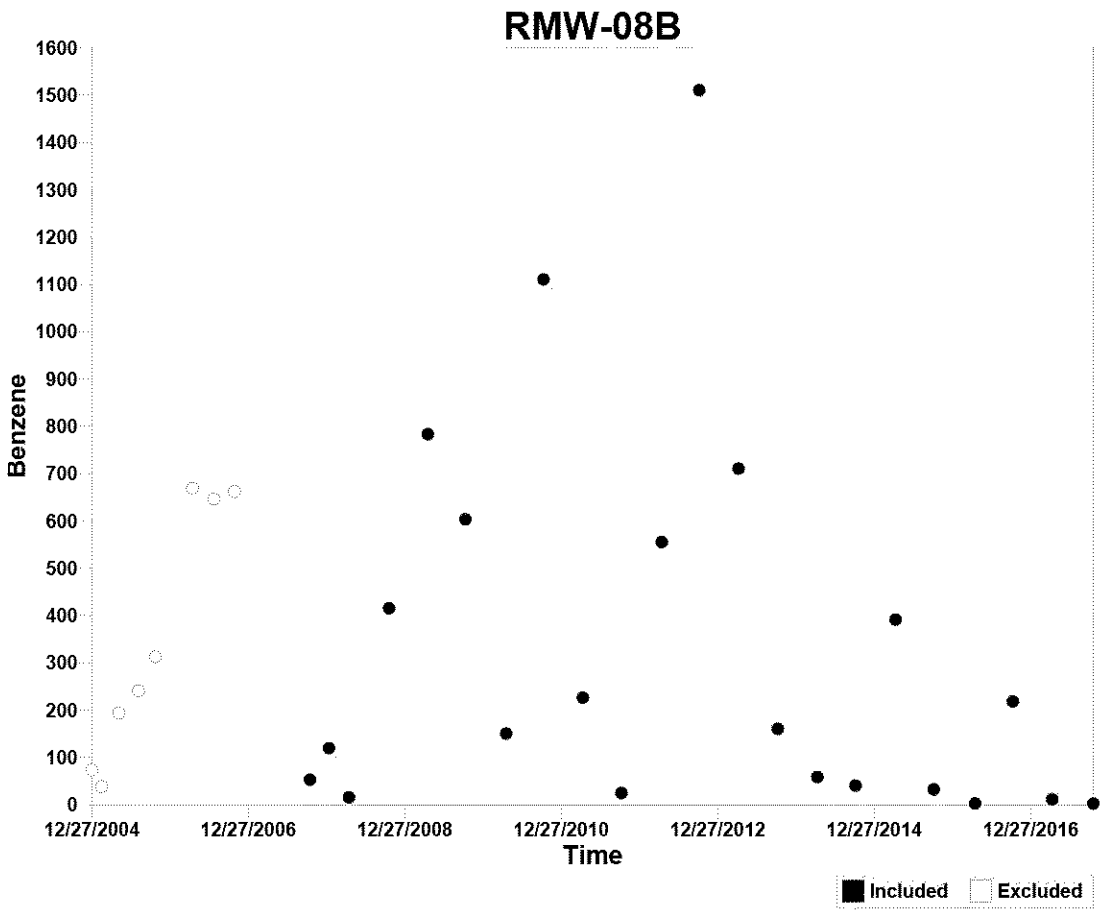
RMW-07F							
Time	Value		Time	Value		Time	Value
9/14/2005	2		10/9/2008	2		4/9/2014	2
10/21/2005	2		4/13/2009	2		10/2/2014	2
1/19/2006	2		4/9/2010	2		4/7/2015	2
4/13/2006	2		10/7/2010	2		10/7/2015	2
7/25/2006	2		4/11/2011	2		4/12/2016	2
10/31/2006	2		10/5/2011	2		10/6/2016	1.2
1/29/2007	2		4/5/2012	2		4/11/2017	2
10/11/2007	2		10/2/2012	2		10/18/2017	2
1/9/2008	2		4/9/2013	2			
4/23/2008	2		10/3/2013	1.6			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



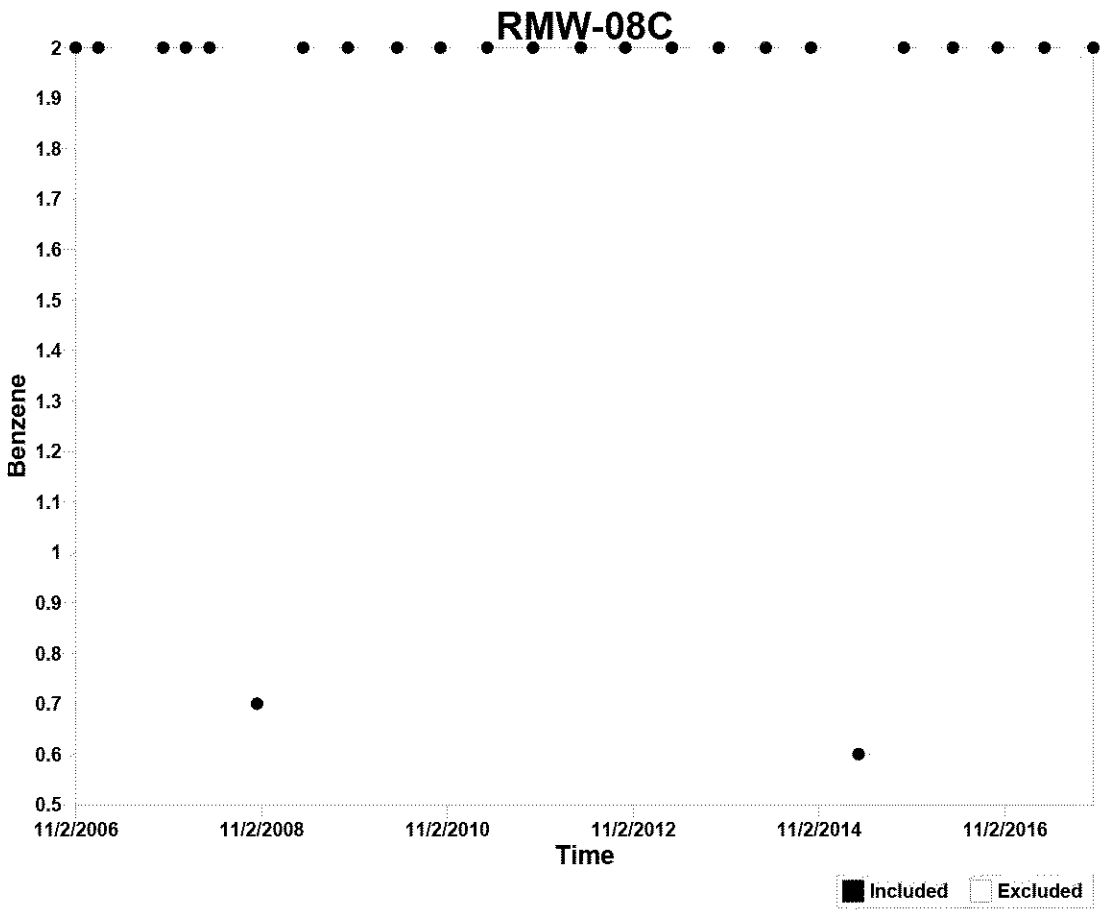
RMW-08A							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
2/10/2005	*143*		10/6/2010	45.6		10/8/2014	114
7/20/2005	*3.6*		4/8/2011	144		10/6/2015	14
10/21/2005	*20*		10/5/2011	138		4/12/2016	9.2
10/13/2008	735		4/5/2012	112		10/7/2016	2
4/9/2009	2370		10/2/2012	104		4/12/2017	2
10/6/2009	2510		4/3/2013	158		10/19/2017	365
4/8/2010	22.9		10/3/2013	835			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



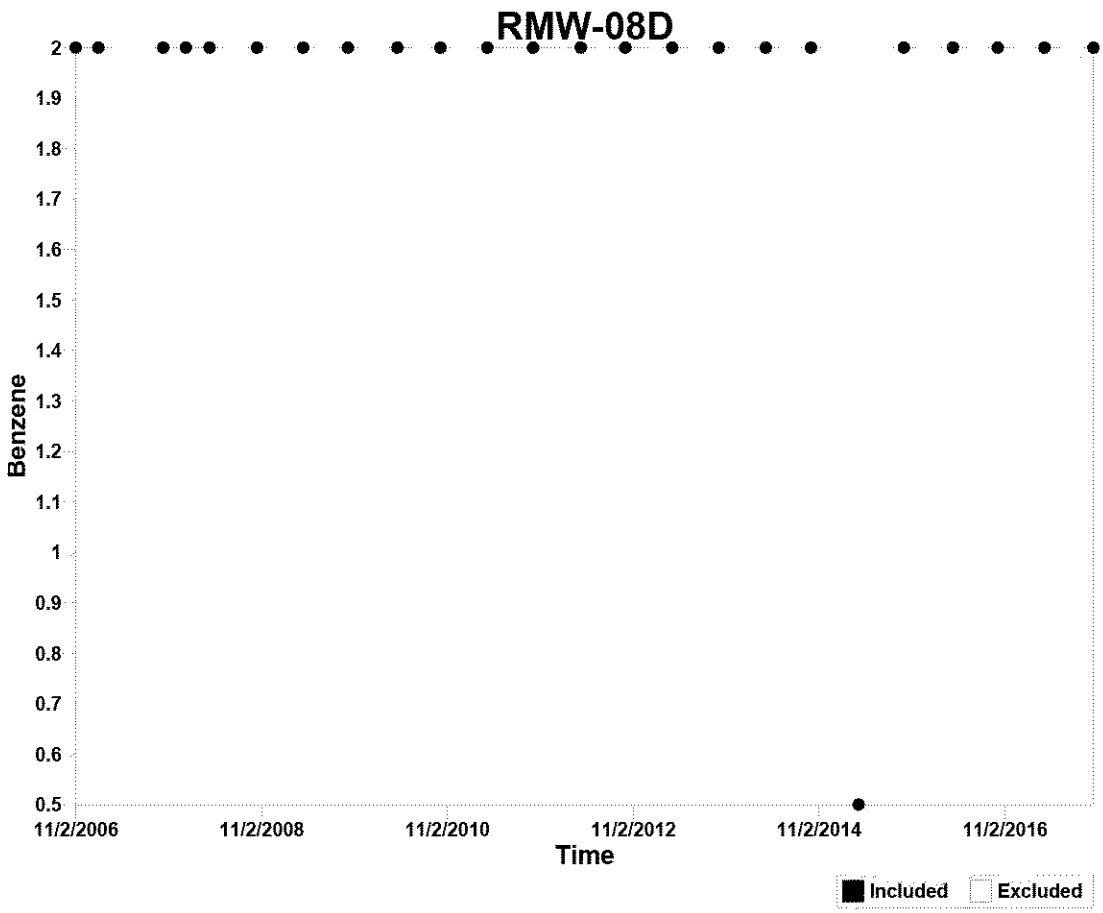
RMW-08B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
12/27/2004	*73.3*		4/11/2008	15.2		4/4/2013	710
2/10/2005	*38.2*		10/15/2008	415		10/4/2013	160
5/2/2005	*194*		4/14/2009	783		4/7/2014	58.2
8/1/2005	*241*		10/7/2009	603		10/2/2014	40
10/19/2005	*313*		4/15/2010	150		4/7/2015	391
4/11/2006	*669*		10/6/2010	1110		10/2/2015	32
7/21/2006	*646*		4/8/2011	226		4/12/2016	2.3
10/24/2006	*662*		10/5/2011	24.2		10/5/2016	218
10/12/2007	52.6		4/10/2012	555		4/7/2017	11
1/9/2008	119		10/2/2012	1510		10/16/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



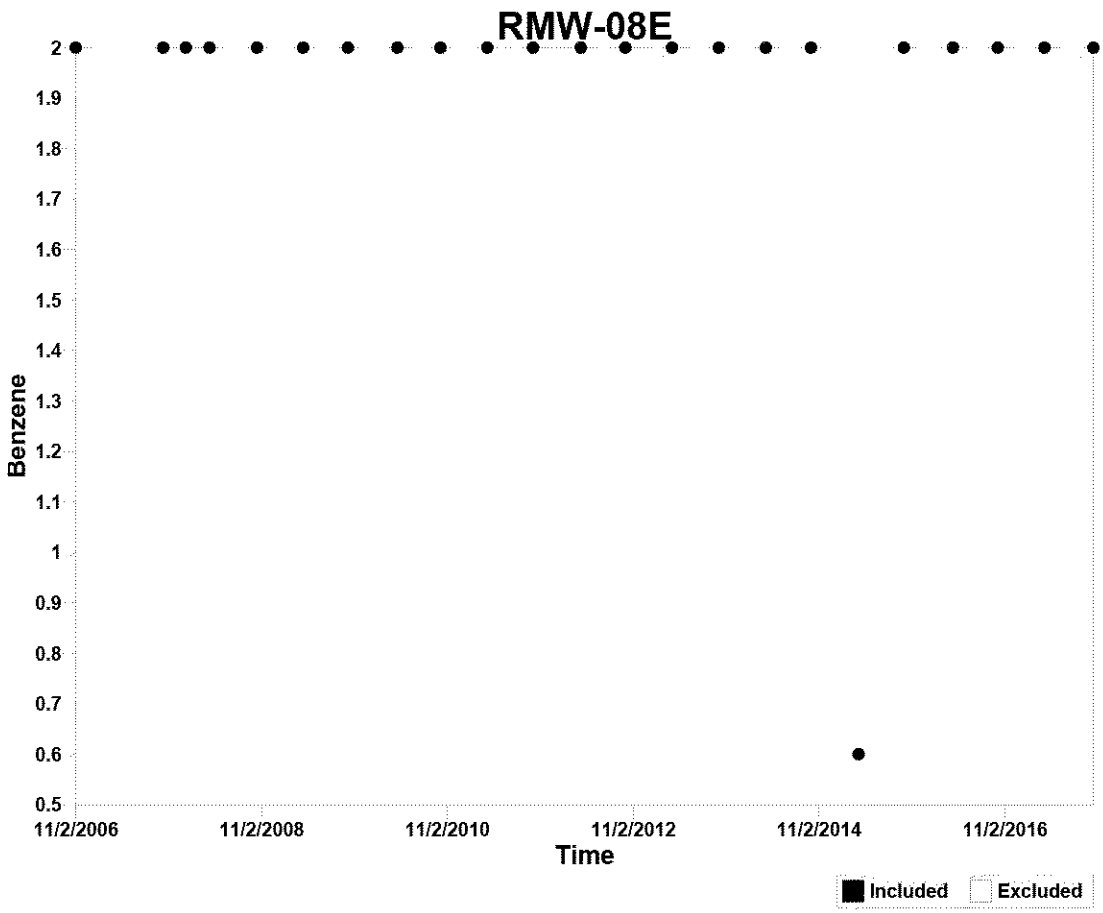
RMW-08C							
Time	Value		Time	Value		Time	Value
11/2/2006	2		4/19/2010	2		4/7/2014	2
1/30/2007	2		10/6/2010	2		10/2/2014	2
10/12/2007	2		4/8/2011	2		4/7/2015	0.6
1/9/2008	2		10/5/2011	2		10/2/2015	2
4/11/2008	2		4/10/2012	2		4/12/2016	2
10/15/2008	0.7		10/2/2012	2		10/5/2016	2
4/14/2009	2		4/3/2013	2		4/7/2017	2
10/7/2009	2		10/4/2013	2		10/16/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



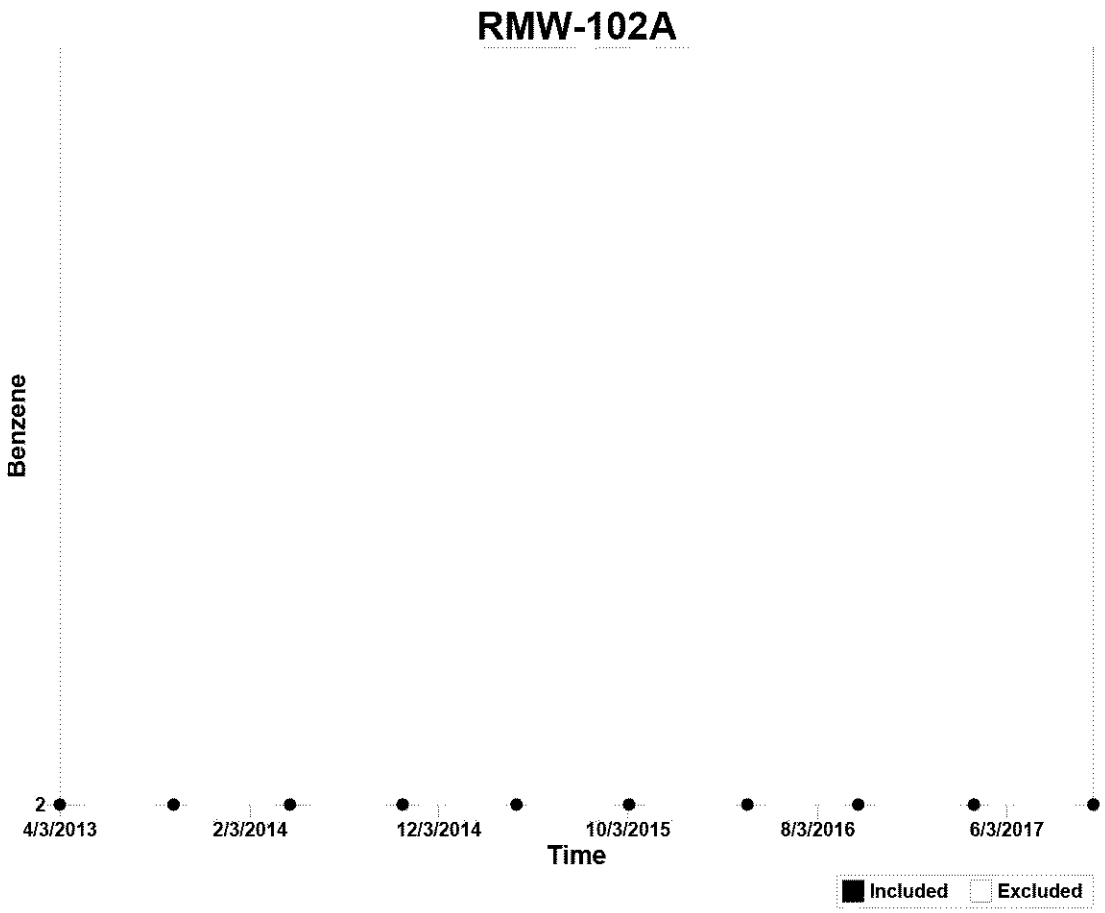
RMW-08D							
Time	Value		Time	Value		Time	Value
11/2/2006	2		4/20/2010	2		4/7/2014	2
1/30/2007	2		10/6/2010	2		10/2/2014	2
10/12/2007	2		4/8/2011	2		4/7/2015	0.5
1/9/2008	2		10/5/2011	2		10/2/2015	2
4/11/2008	2		4/10/2012	2		4/12/2016	2
10/15/2008	2		10/2/2012	2		10/5/2016	2
4/14/2009	2		4/4/2013	2		4/7/2017	2
10/7/2009	2		10/4/2013	2		10/16/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



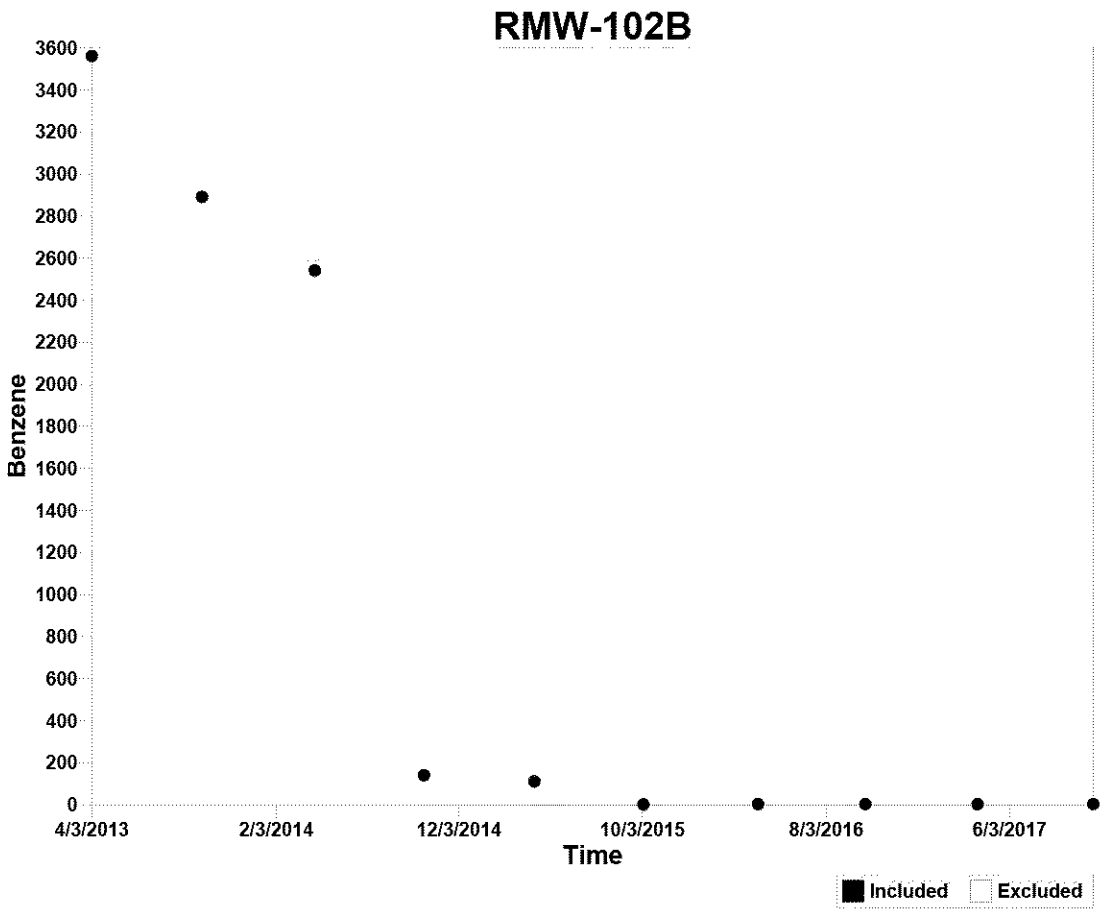
RMW-08E							
Time	Value		Time	Value		Time	Value
11/2/2006	2		10/6/2010	2		10/2/2014	2
10/12/2007	2		4/8/2011	2		4/7/2015	0.6
1/9/2008	2		10/5/2011	2		10/2/2015	2
4/11/2008	2		4/10/2012	2		4/12/2016	2
10/15/2008	2		10/2/2012	2		10/5/2016	2
4/14/2009	2		4/3/2013	2		4/7/2017	2
10/7/2009	2		10/4/2013	2		10/16/2017	2
4/20/2010	2		4/7/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



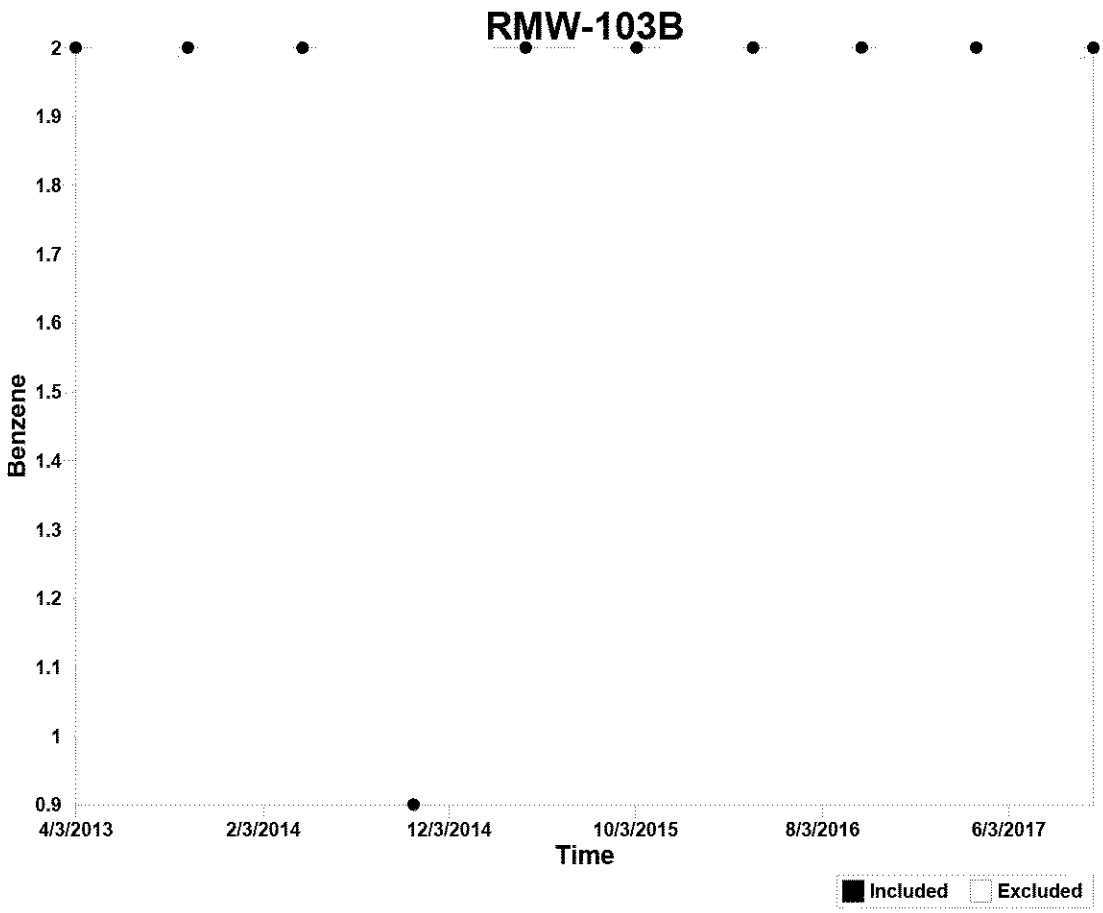
RMW-102A							
Time	Value		Time	Value		Time	Value
4/3/2013	2		4/7/2015	2		4/11/2017	2
10/3/2013	2		10/5/2015	2		10/20/2017	2
4/8/2014	2		4/12/2016	2			
10/6/2014	2		10/7/2016	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



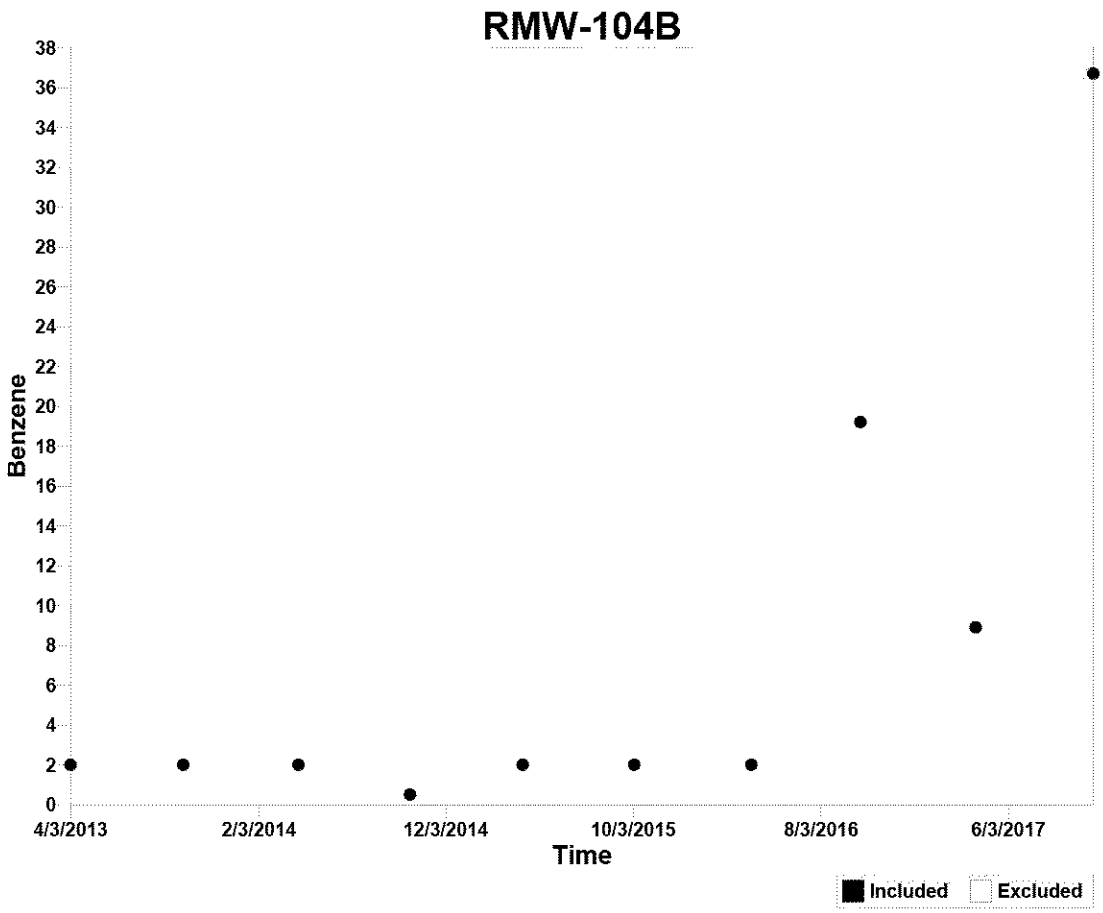
RMW-102B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
4/3/2013	3560		4/7/2015	110		4/11/2017	2
10/3/2013	2890		10/5/2015	0.5		10/20/2017	2
4/8/2014	2540		4/12/2016	2			
10/6/2014	139		10/7/2016	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



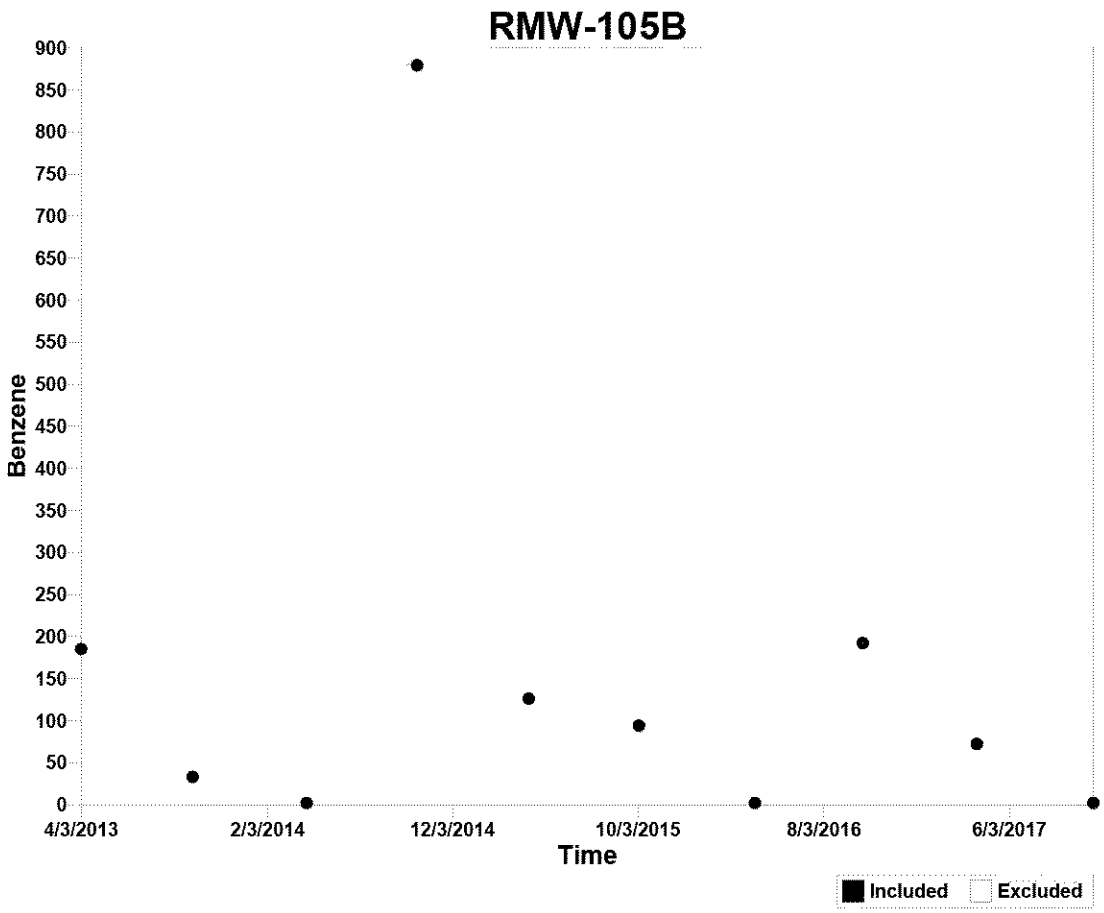
RMW-103B							
Time	Value		Time	Value		Time	Value
4/3/2013	2		4/7/2015	2		4/11/2017	2
10/3/2013	2		10/5/2015	2		10/19/2017	2
4/8/2014	2		4/12/2016	2			
10/6/2014	0.9		10/6/2016	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



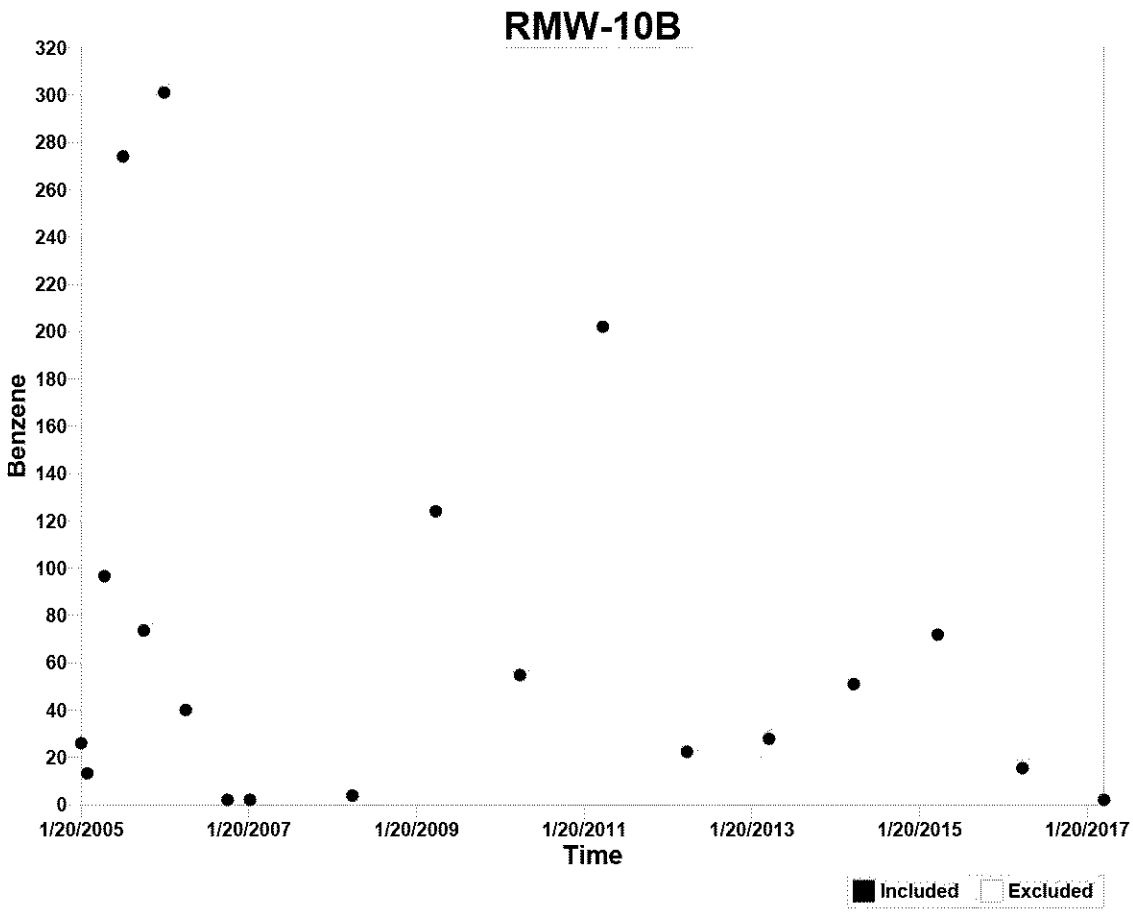
RMW-104B							
Time	Value		Time	Value		Time	Value
4/3/2013	2		4/7/2015	2		4/11/2017	8.9
10/3/2013	2		10/5/2015	2		10/19/2017	36.7
4/8/2014	2		4/12/2016	2			
10/6/2014	0.5		10/6/2016	19.2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



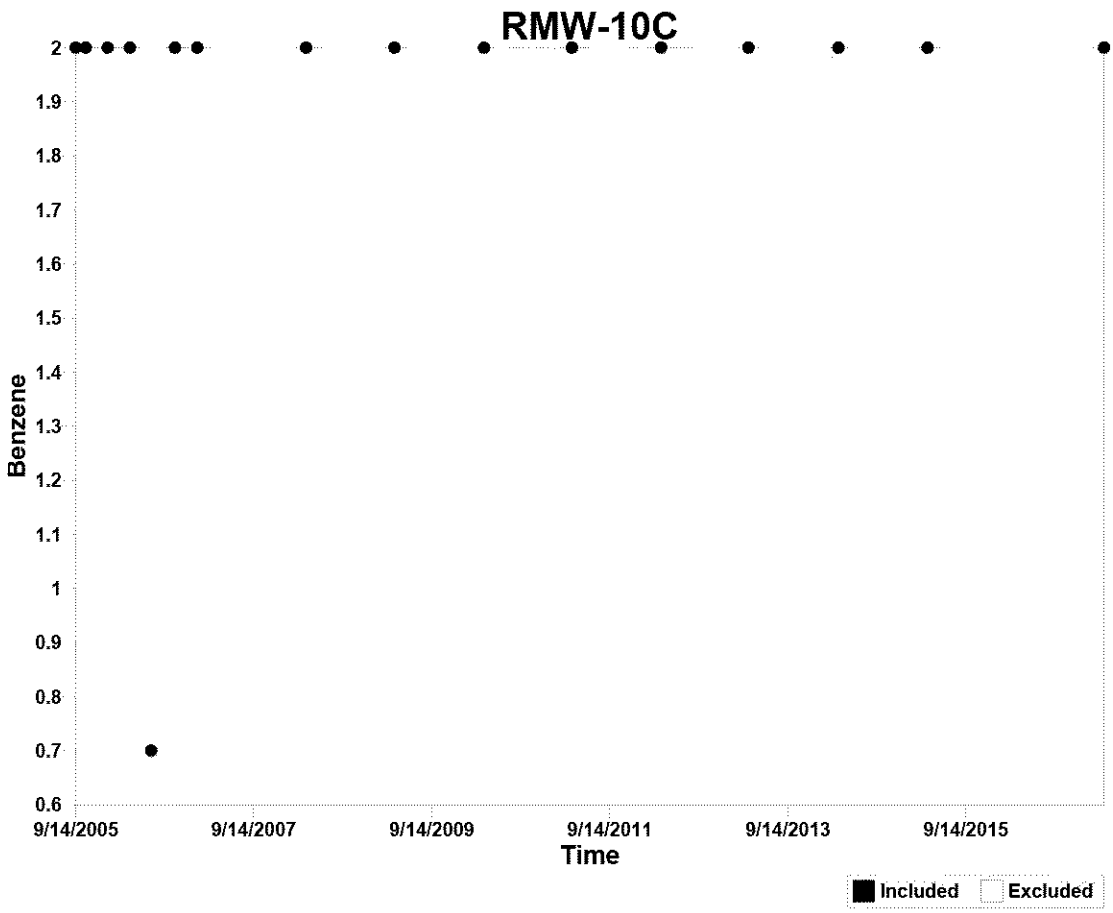
RMW-105B							
Time	Value		Time	Value		Time	Value
4/3/2013	185		4/7/2015	126		4/11/2017	72
10/3/2013	32.9		10/5/2015	93.9		10/19/2017	2
4/8/2014	1.9		4/12/2016	2			
10/6/2014	879		10/6/2016	192			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



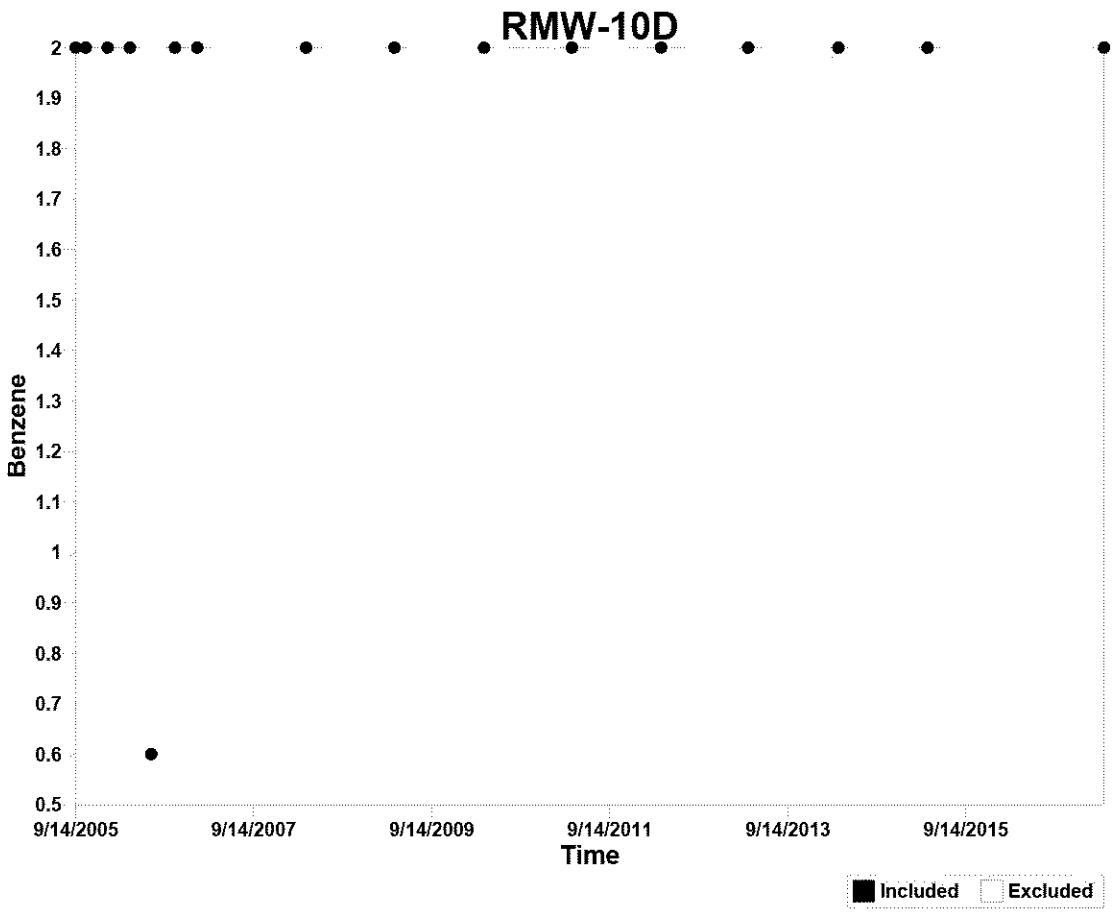
RMW-10B							
Time	Value		Time	Value		Time	Value
1/20/2005	26		10/20/2006	2		4/5/2013	27.8
2/16/2005	13.2		1/26/2007	2		4/9/2014	50.9
5/2/2005	96.6		4/16/2008	3.8		4/10/2015	71.8
7/22/2005	274		4/14/2009	124		4/13/2016	15.4
10/20/2005	73.6		4/16/2010	54.7		4/3/2017	2
1/17/2006	301		4/12/2011	202			
4/21/2006	40		4/12/2012	22.3			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-10C							
Time	Value		Time	Value		Time	Value
9/14/2005	2		1/26/2007	2		4/5/2013	2
10/25/2005	2		4/16/2008	2		4/9/2014	2
1/23/2006	2		4/14/2009	2		4/10/2015	2
4/24/2006	2		4/16/2010	2		4/3/2017	2
7/21/2006	0.7		4/12/2011	2			
10/26/2006	2		4/12/2012	2			

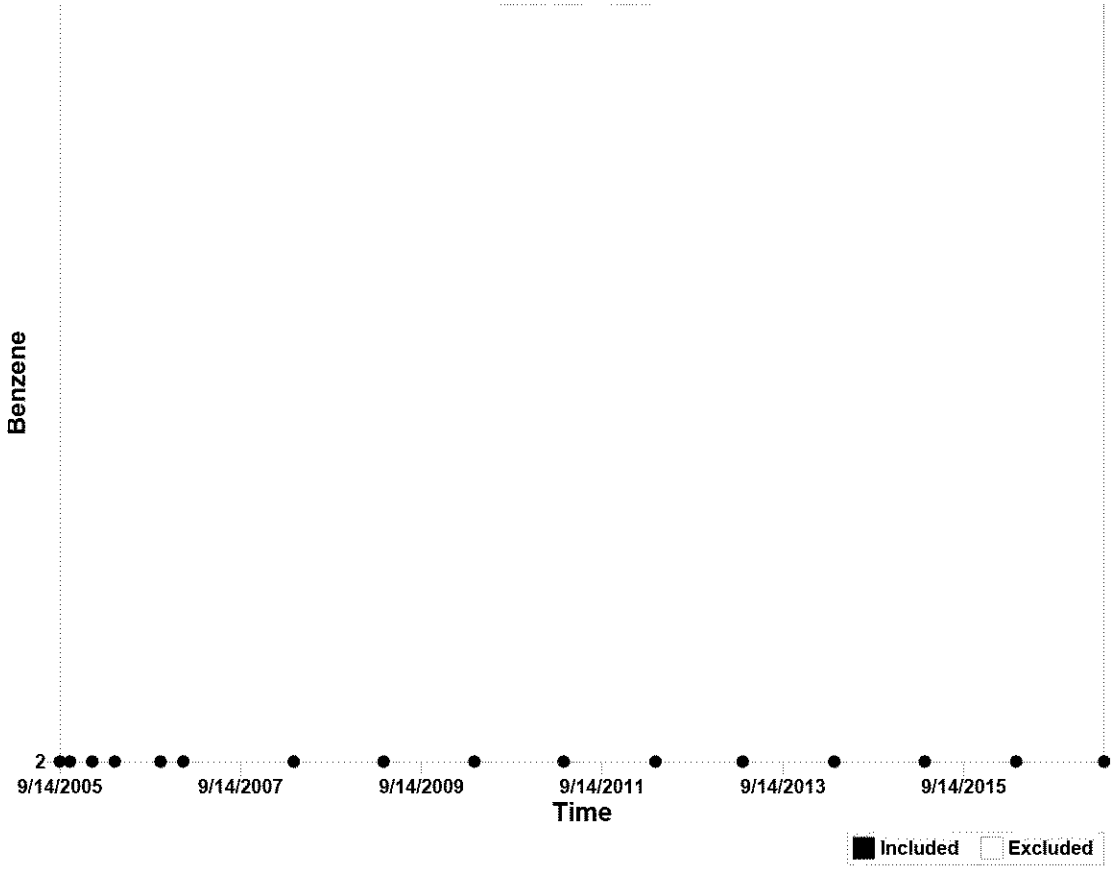
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-10D							
Time	Value		Time	Value		Time	Value
9/14/2005	2		1/26/2007	2		4/4/2013	2
10/25/2005	2		4/16/2008	2		4/9/2014	2
1/23/2006	2		4/14/2009	2		4/10/2015	2
4/24/2006	2		4/16/2010	2		4/3/2017	2
7/21/2006	0.6		4/12/2011	2			
10/26/2006	2		4/12/2012	2			

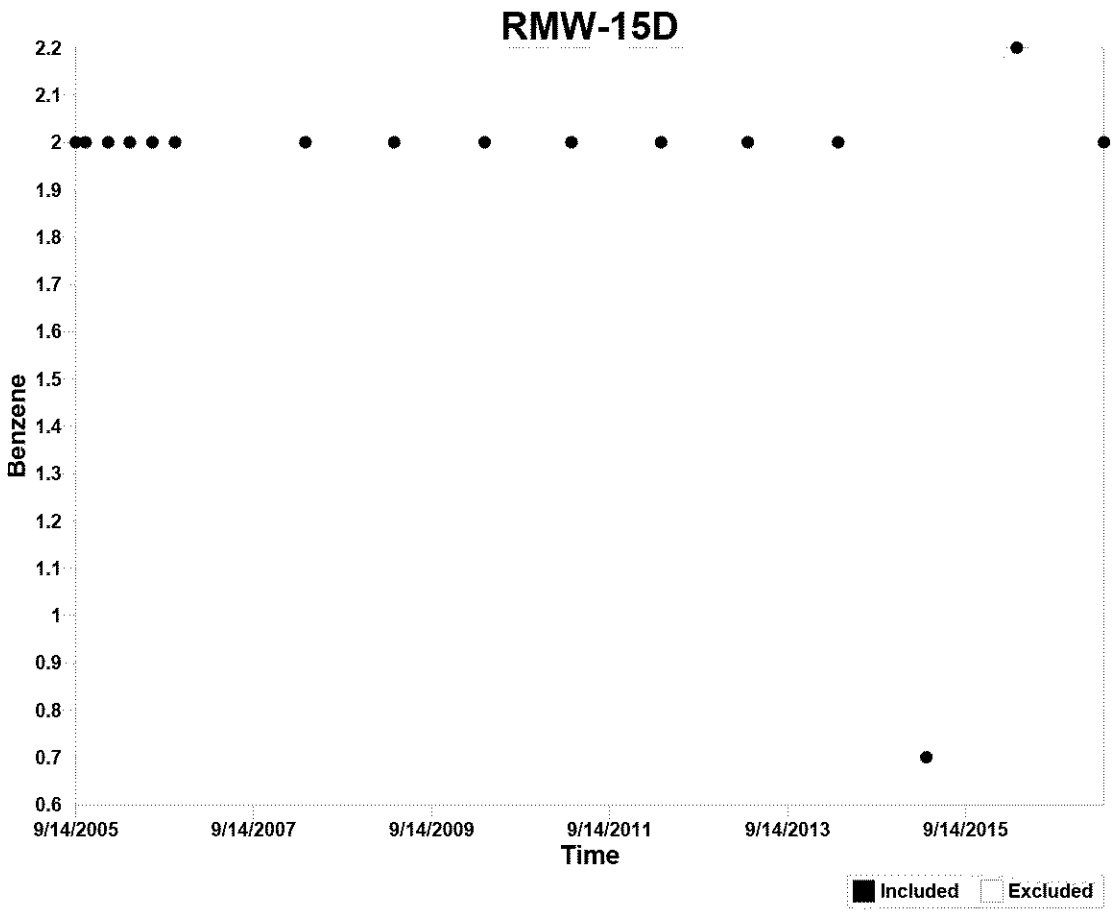
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-10E



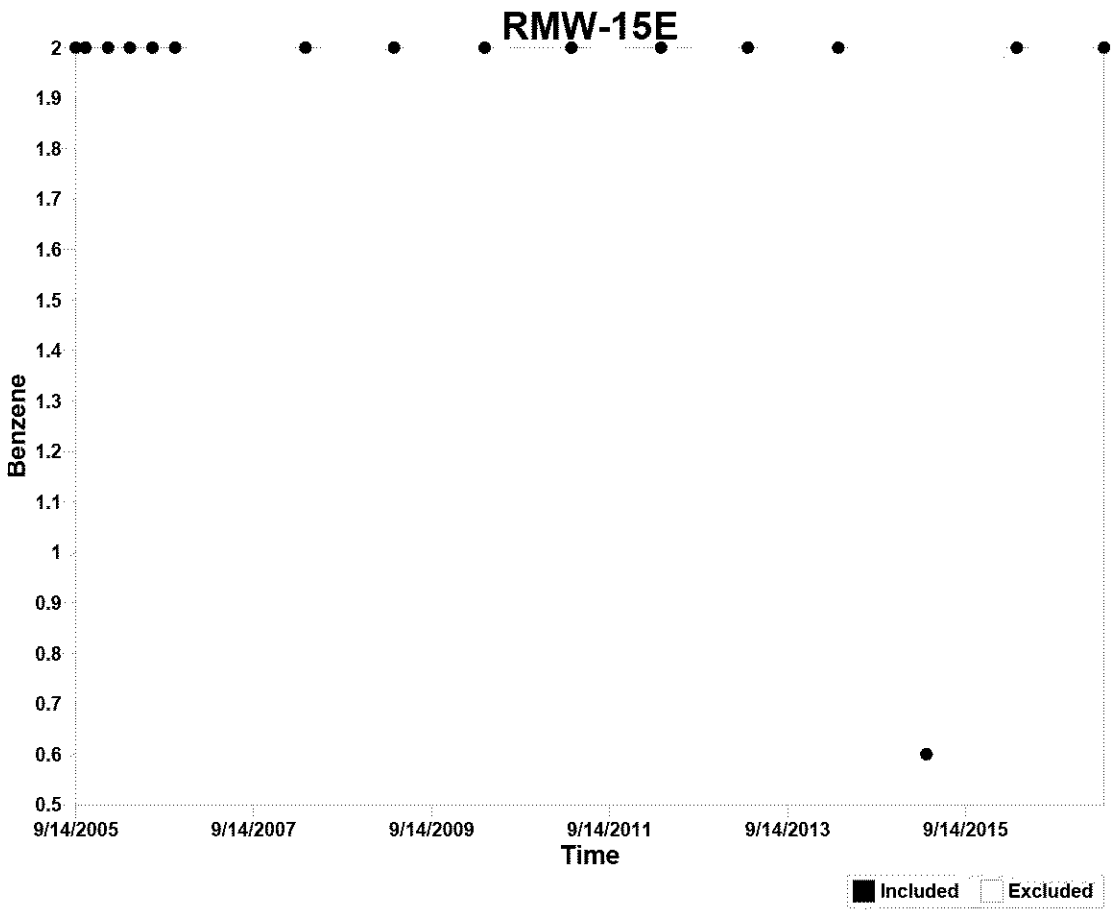
RMW-10E							
Time	Value		Time	Value		Time	Value
9/14/2005	2		4/16/2008	2		4/9/2014	2
10/25/2005	2		4/14/2009	2		4/10/2015	2
1/23/2006	2		4/16/2010	2		4/13/2016	2
4/24/2006	2		4/12/2011	2		4/3/2017	2
10/26/2006	2		4/17/2012	2			
1/26/2007	2		4/4/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



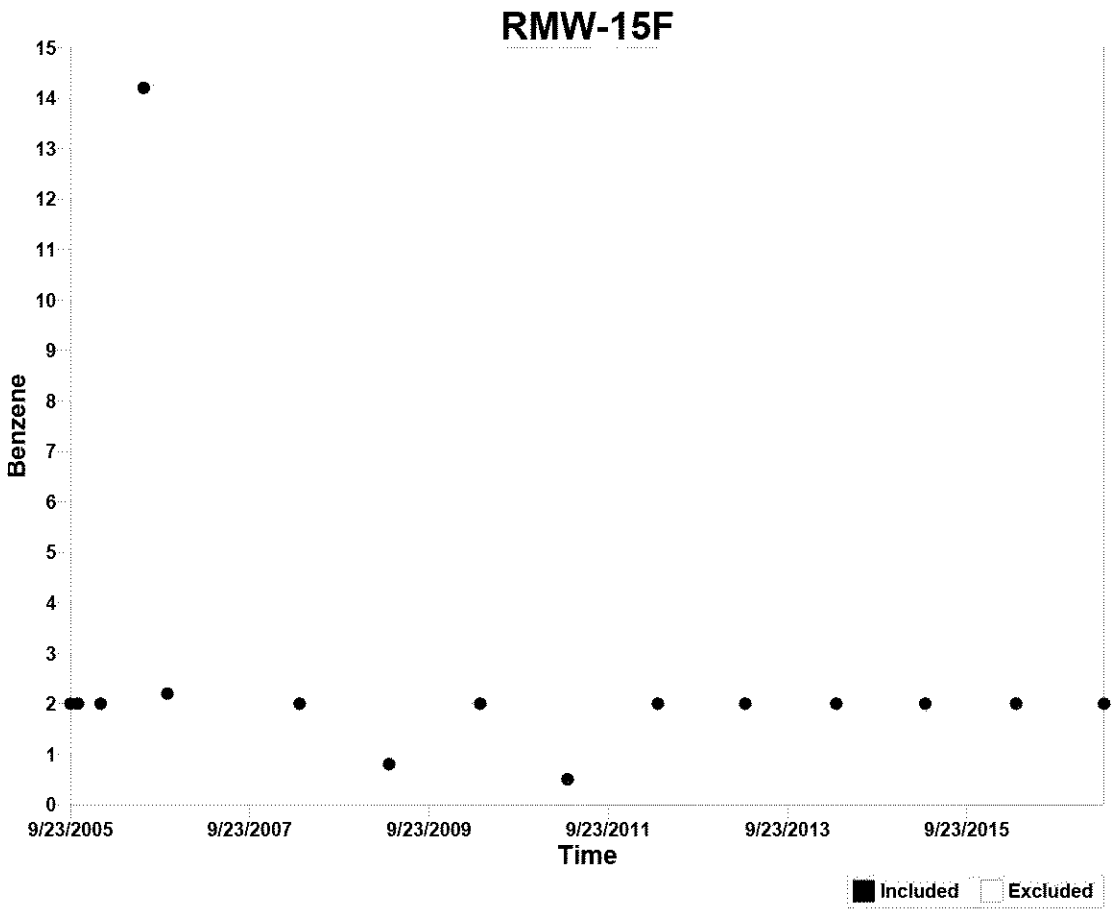
RMW-15D							
Time	Value		Time	Value		Time	Value
9/14/2005	2		4/14/2008	2		4/10/2014	2
10/24/2005	2		4/13/2009	2		4/7/2015	0.7
1/25/2006	2		4/20/2010	2		4/12/2016	2.2
4/24/2006	2		4/11/2011	2		4/5/2017	2
7/26/2006	2		4/13/2012	2			
10/27/2006	2		4/4/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



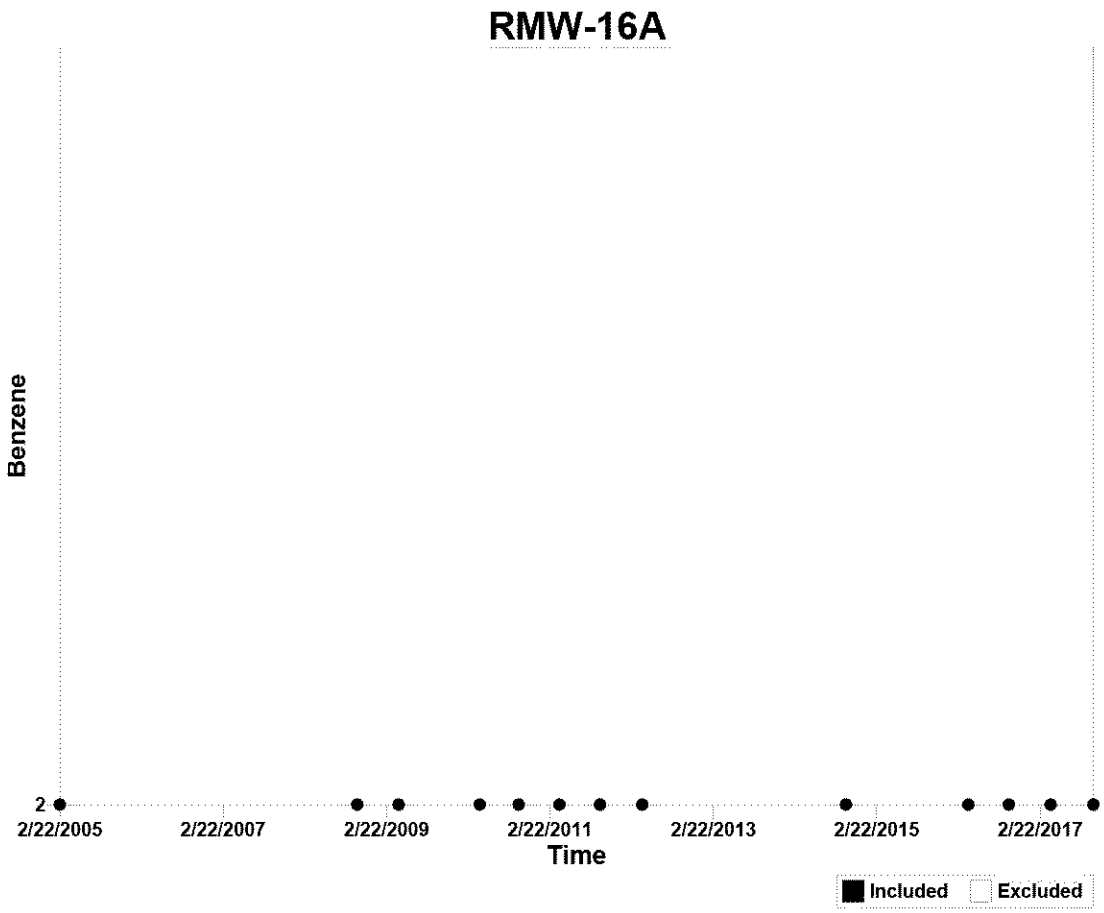
RMW-15E								
Time	Value		Time	Value		Time	Value
9/14/2005	2		4/14/2008	2		4/10/2014	2
10/24/2005	2		4/13/2009	2		4/7/2015	0.6
1/25/2006	2		4/20/2010	2		4/12/2016	2
4/24/2006	2		4/11/2011	2		4/5/2017	2
7/26/2006	2		4/13/2012	2			
10/27/2006	2		4/4/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



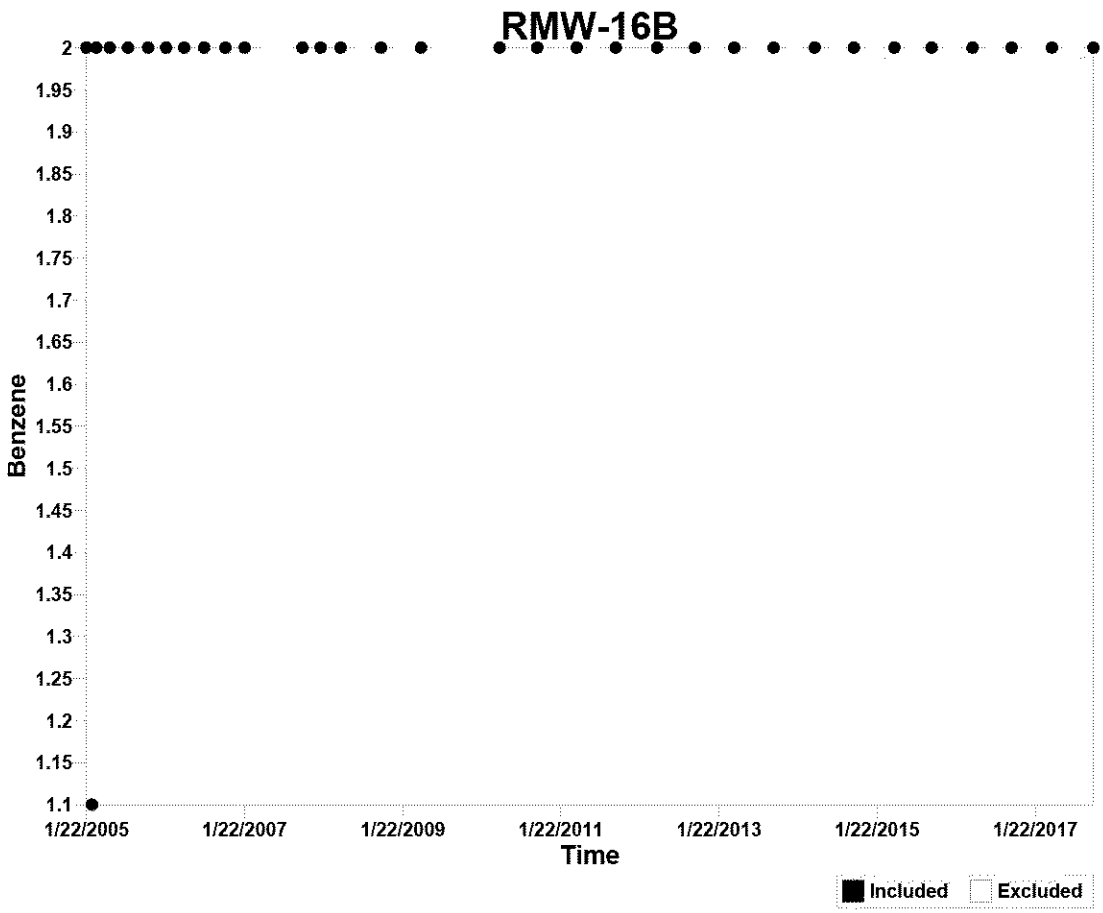
RMW-15F							
Time	Value		Time	Value		Time	Value
9/23/2005	2		4/14/2008	2		4/4/2013	2
10/24/2005	2		4/14/2009	0.8		4/10/2014	2
1/24/2006	2		4/20/2010	2		4/8/2015	2
7/19/2006	14.2		4/11/2011	0.5		4/12/2016	2
10/23/2006	2.2		4/13/2012	2		4/5/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-16A							
Time	Value		Time	Value		Time	Value
2/22/2005	2		4/6/2011	2		10/5/2016	2
10/14/2008	2		10/4/2011	2		4/10/2017	2
4/17/2009	2		4/10/2012	2		10/18/2017	2
4/15/2010	2		10/8/2014	2			
10/6/2010	2		4/7/2016	2			

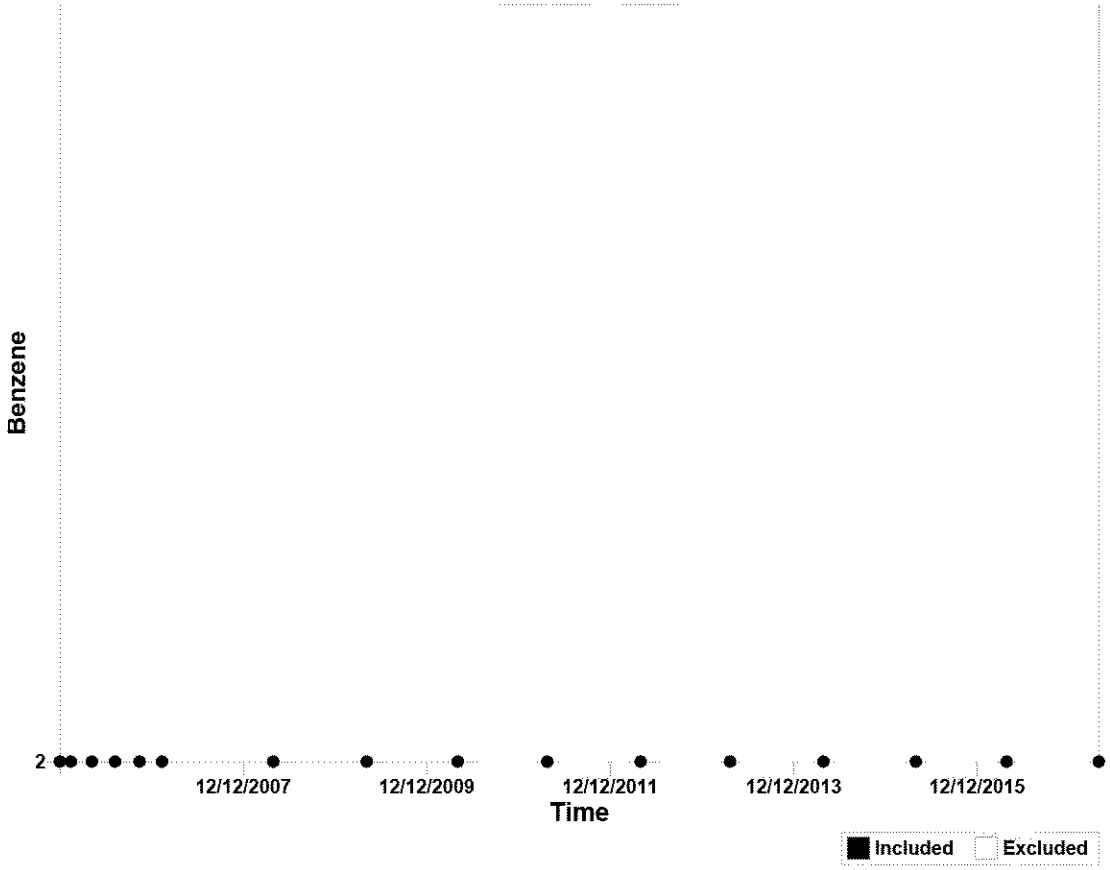
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-16B							
Time	Value		Time	Value		Time	Value
1/22/2005	2		10/17/2007	2		4/3/2013	2
2/17/2005	1.1		1/9/2008	2		10/2/2013	2
3/9/2005	2		4/10/2008	2		4/10/2014	2
5/10/2005	2		10/14/2008	2		10/8/2014	2
8/2/2005	2		4/17/2009	2		4/13/2015	2
11/3/2005	2		4/15/2010	2		10/2/2015	2
1/25/2006	2		10/6/2010	2		4/8/2016	2
4/19/2006	2		4/6/2011	2		10/5/2016	2
7/20/2006	2		10/4/2011	2		4/10/2017	2
10/26/2006	2		4/12/2012	2		10/18/2017	2
1/23/2007	2		10/3/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

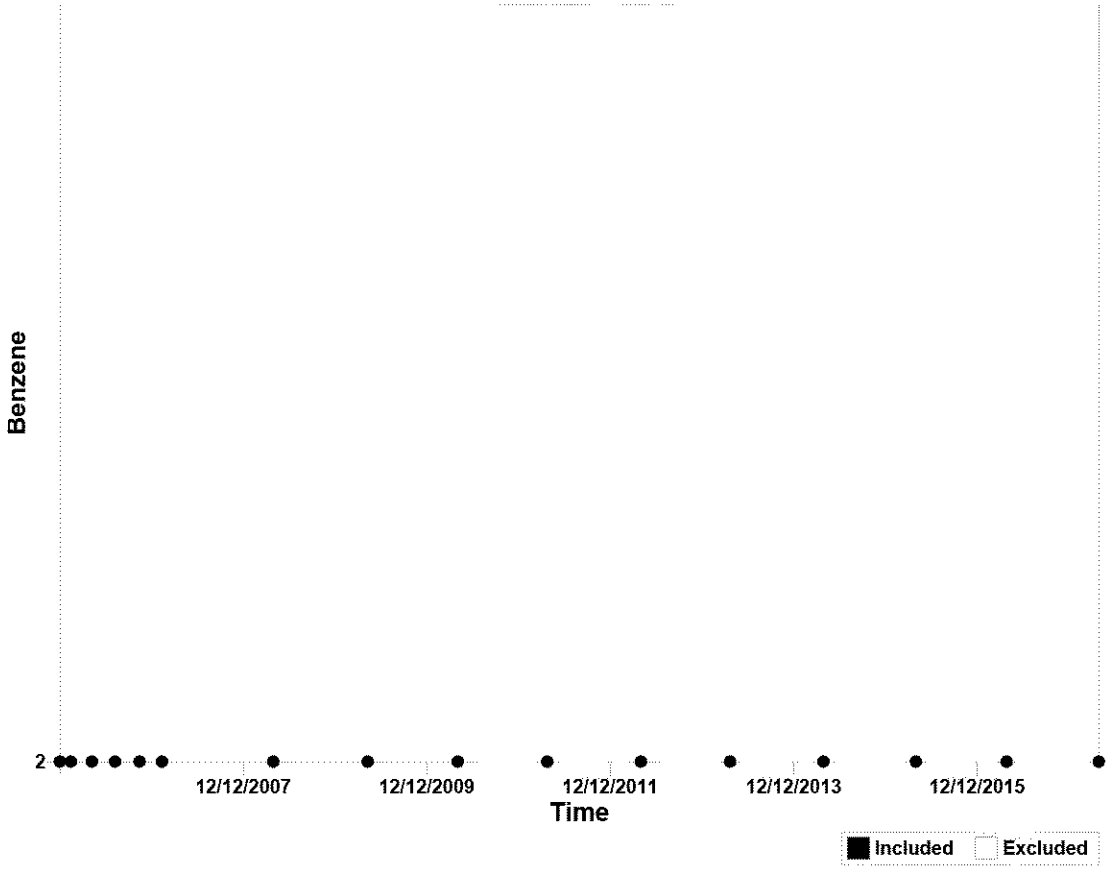
RMW-16C



RMW-16C							
Time	Value		Time	Value		Time	Value
12/12/2005	2		4/10/2008	2		4/10/2014	2
1/25/2006	2		4/17/2009	2		4/13/2015	2
4/19/2006	2		4/15/2010	2		4/8/2016	2
7/20/2006	2		4/6/2011	2		4/10/2017	2
10/26/2006	2		4/12/2012	2			
1/23/2007	2		4/3/2013	2			

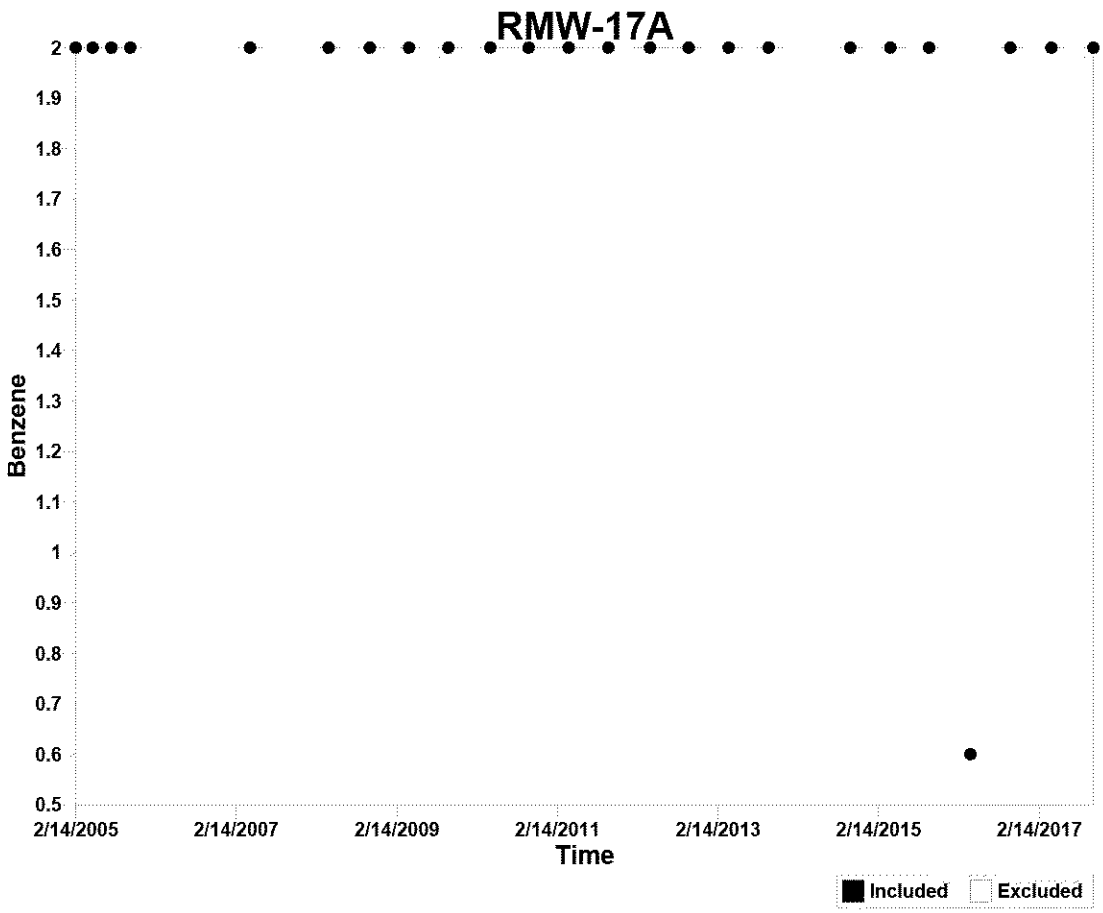
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-16D



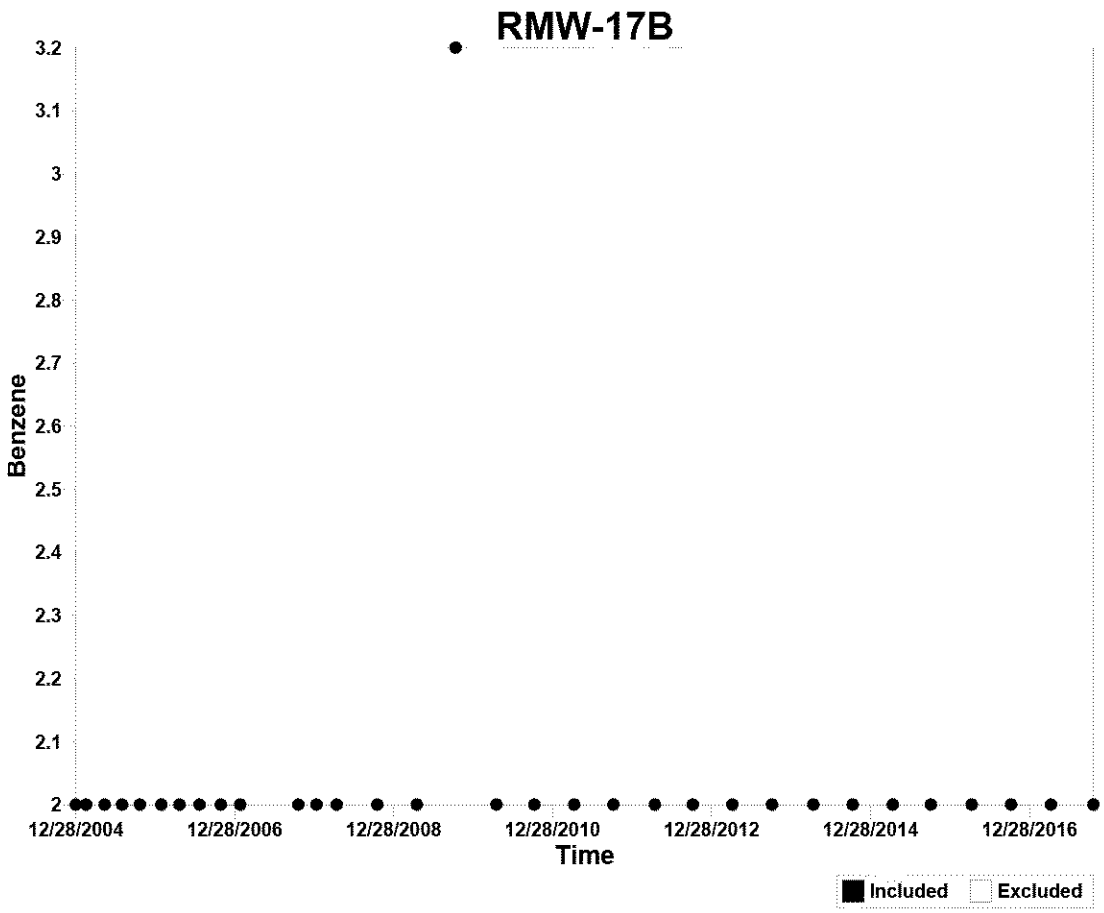
RMW-16D							
Time	Value		Time	Value		Time	Value
12/12/2005	2		4/10/2008	2		4/10/2014	2
1/25/2006	2		4/21/2009	2		4/13/2015	2
4/19/2006	2		4/15/2010	2		4/8/2016	2
7/20/2006	2		4/6/2011	2		4/10/2017	2
10/26/2006	2		4/13/2012	2			
1/23/2007	2		4/3/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-17A							
Time	Value		Time	Value		Time	Value
2/14/2005	2		10/6/2009	2		10/2/2013	2
5/2/2005	2		4/15/2010	2		10/8/2014	2
7/26/2005	2		10/6/2010	2		4/9/2015	2
10/20/2005	2		4/6/2011	2		10/2/2015	2
4/18/2007	2		10/4/2011	2		4/7/2016	0.6
4/9/2008	2		4/10/2012	2		10/5/2016	2
10/14/2008	2		10/3/2012	2		4/10/2017	2
4/10/2009	2		4/3/2013	2		10/18/2017	2

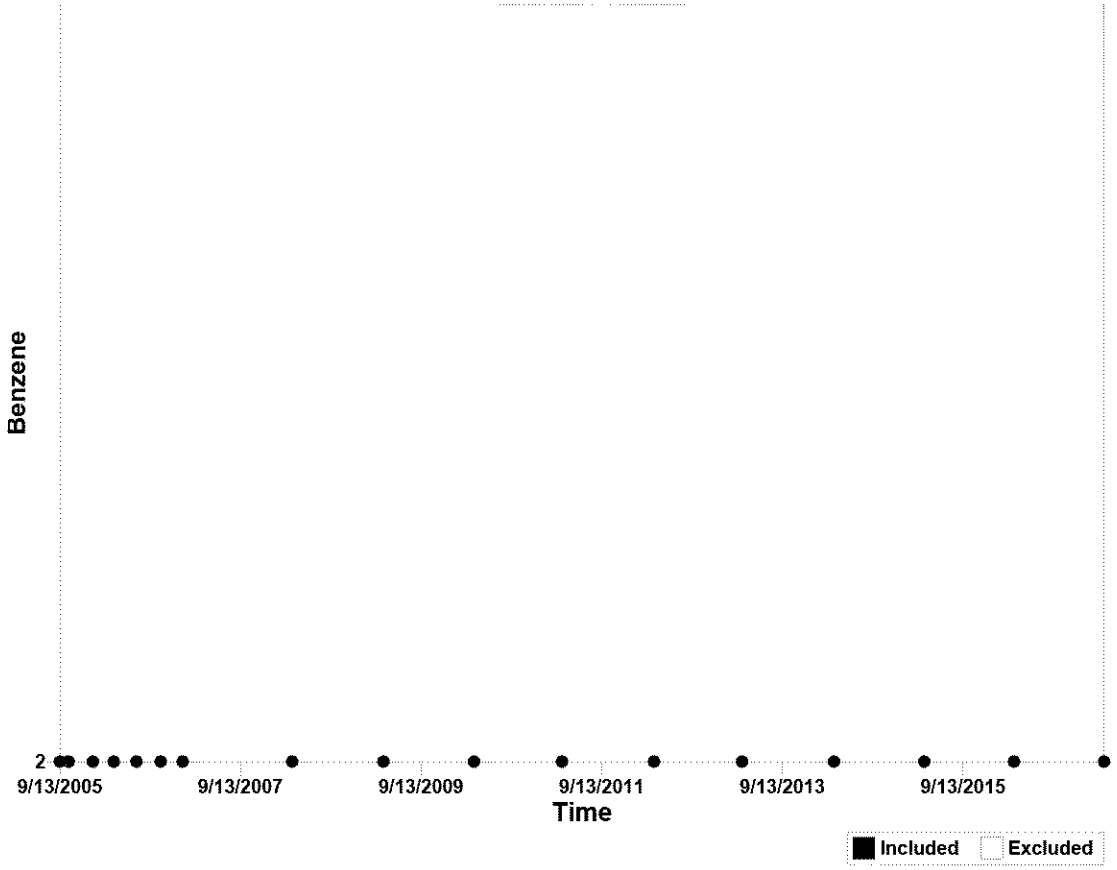
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-17B							
Time	Value		Time	Value		Time	Value
12/28/2004	2		1/9/2008	2		4/3/2013	2
2/14/2005	2		4/10/2008	2		10/2/2013	2
5/10/2005	2		10/14/2008	2		4/10/2014	2
7/29/2005	2		4/14/2009	2		10/8/2014	2
10/19/2005	2		10/9/2009	3.2		4/10/2015	2
1/25/2006	2		4/15/2010	2		10/2/2015	2
4/19/2006	2		10/6/2010	2		4/7/2016	2
7/20/2006	2		4/7/2011	2		10/5/2016	2
10/26/2006	2		10/4/2011	2		4/6/2017	2
1/23/2007	2		4/12/2012	2		10/18/2017	2
10/17/2007	2		10/3/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

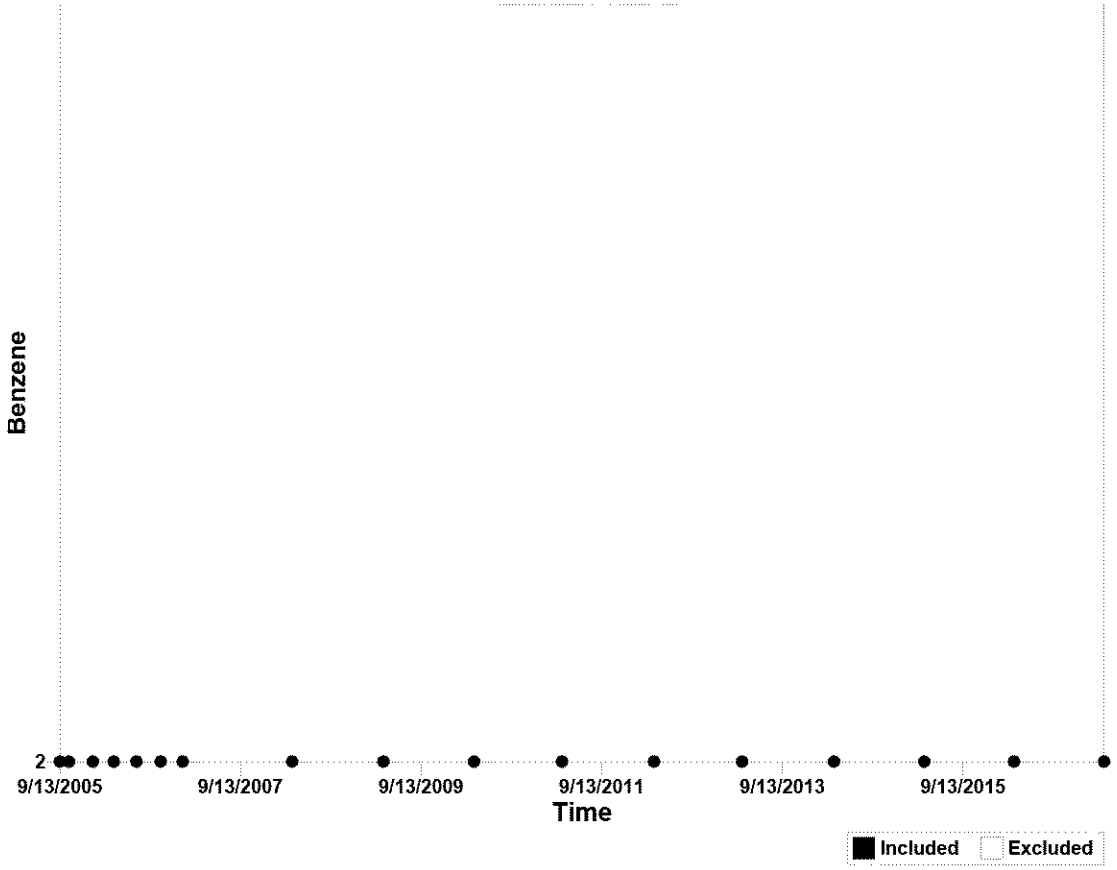
RMW-17C



RMW-17C							
Time	Value		Time	Value		Time	Value
9/13/2005	2		1/23/2007	2		4/3/2013	2
10/19/2005	2		4/10/2008	2		4/10/2014	2
1/25/2006	2		4/14/2009	2		4/10/2015	2
4/19/2006	2		4/15/2010	2		4/7/2016	2
7/20/2006	2		4/6/2011	2		4/6/2017	2
10/26/2006	2		4/12/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

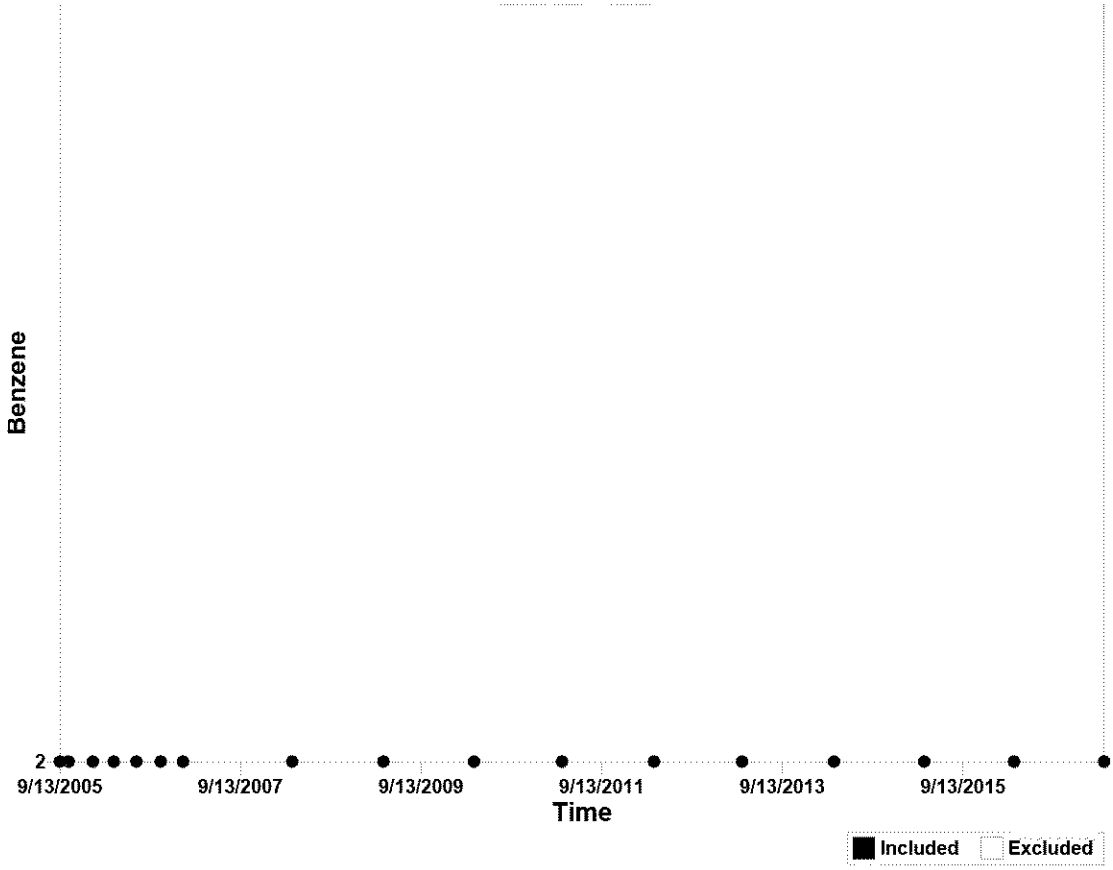
RMW-17D



RMW-17D							
Time	Value		Time	Value		Time	Value
9/13/2005	2		1/23/2007	2		4/3/2013	2
10/20/2005	2		4/10/2008	2		4/10/2014	2
1/25/2006	2		4/14/2009	2		4/10/2015	2
4/19/2006	2		4/15/2010	2		4/7/2016	2
7/20/2006	2		4/6/2011	2		4/6/2017	2
10/26/2006	2		4/12/2012	2			

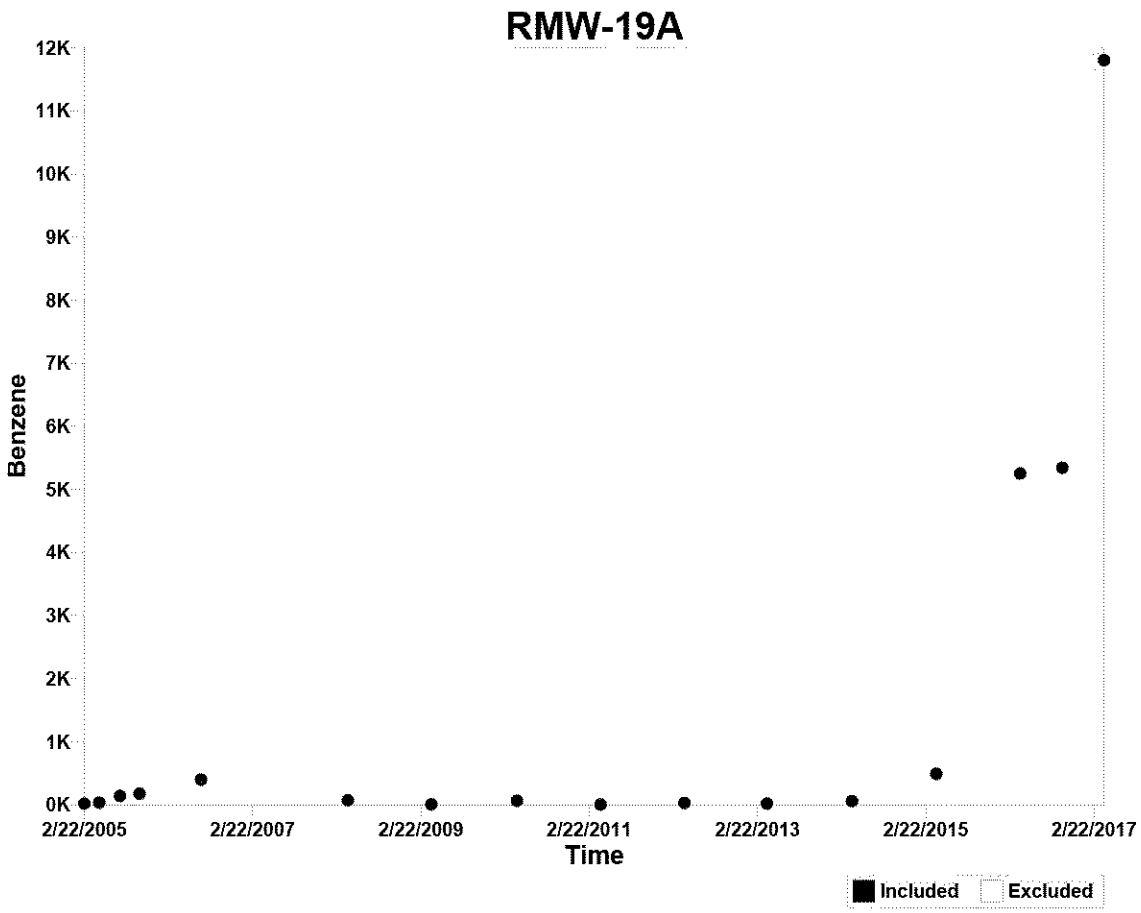
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-17E



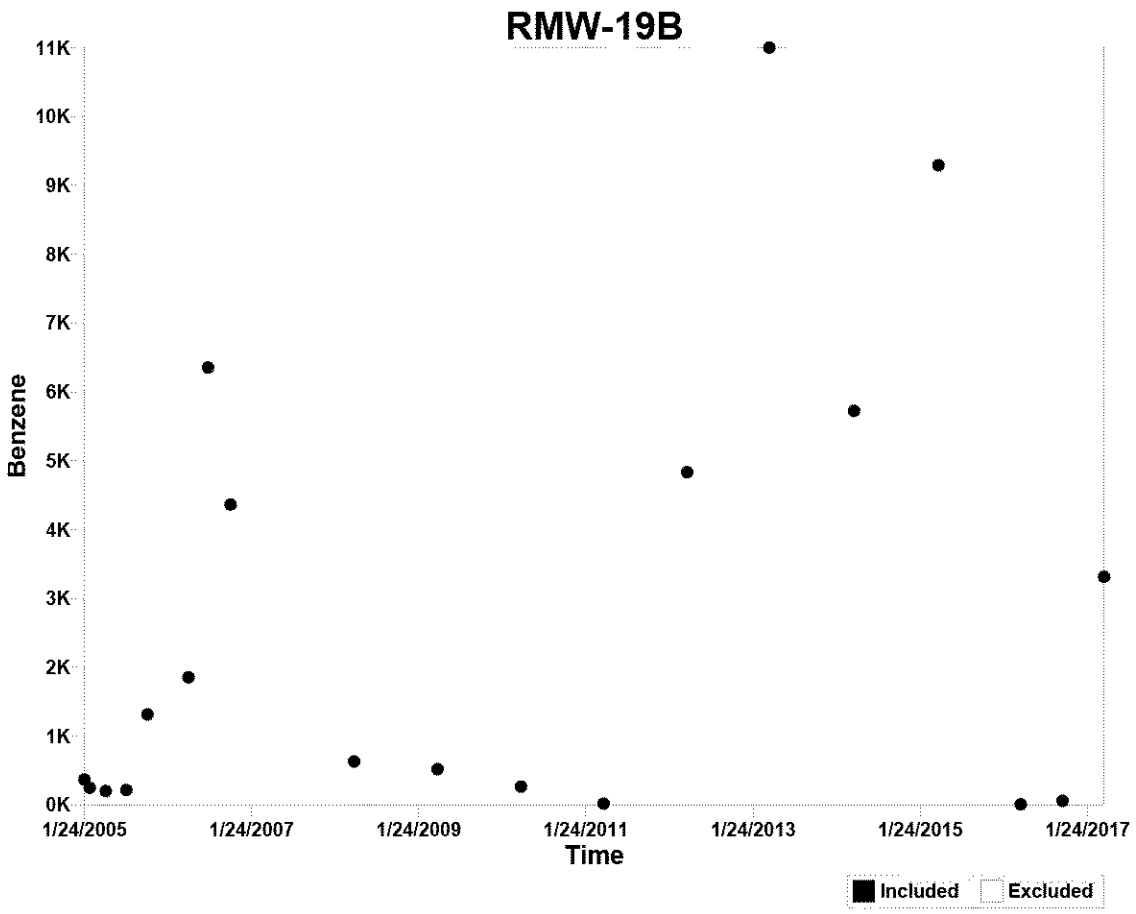
RMW-17E							
Time	Value		Time	Value		Time	Value
9/13/2005	2		1/24/2007	2		4/3/2013	2
10/19/2005	2		4/10/2008	2		4/10/2014	2
1/25/2006	2		4/14/2009	2		4/10/2015	2
4/19/2006	2		4/15/2010	2		4/7/2016	2
7/20/2006	2		4/6/2011	2		4/6/2017	2
10/26/2006	2		4/12/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-19A							
Time	Value		Time	Value		Time	Value
2/22/2005	15.8		4/9/2009	2.5		4/9/2015	488
4/28/2005	31.7		4/15/2010	59.1		4/7/2016	5250
7/27/2005	139		4/13/2011	2		10/7/2016	5340
10/20/2005	174		4/11/2012	26		4/6/2017	11800
7/14/2006	397		4/4/2013	16			
4/11/2008	68.1		4/8/2014	55.2			

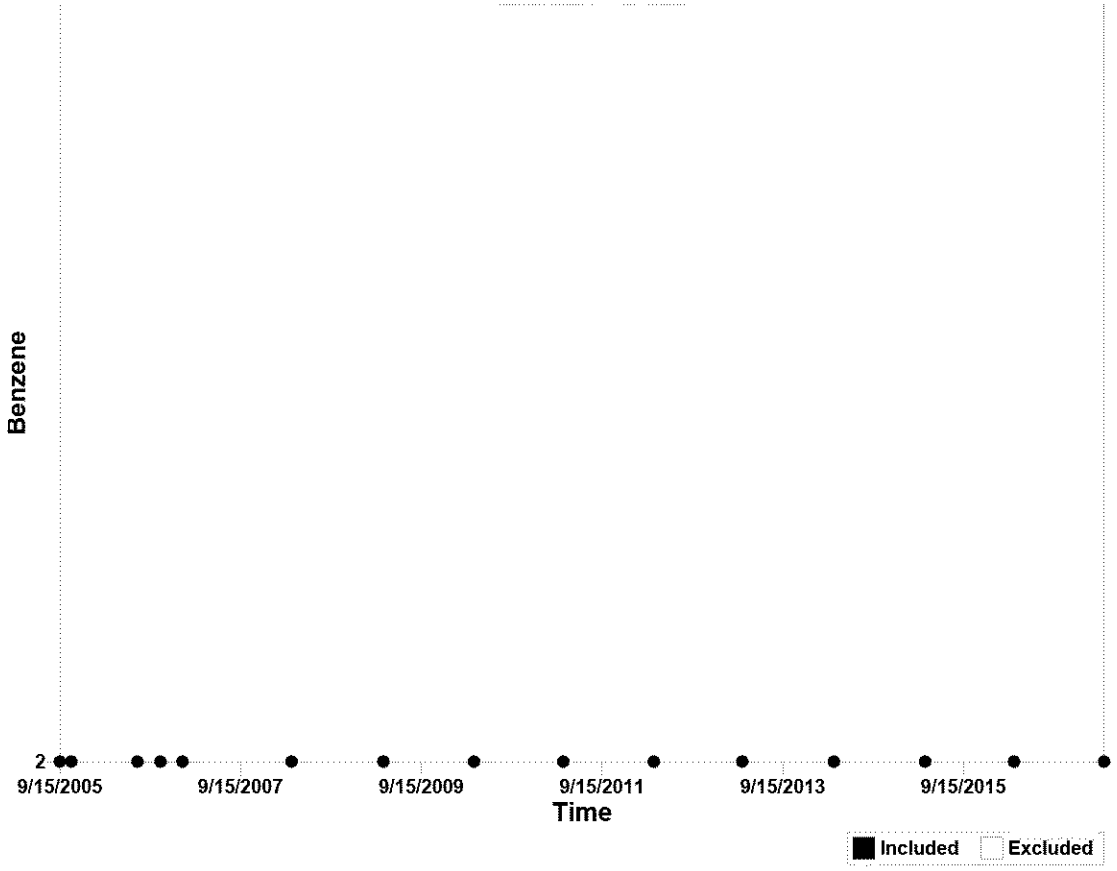
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-19B							
Time	Value		Time	Value		Time	Value
1/24/2005	365		10/25/2006	4360		4/10/2014	5720
2/17/2005	245		4/17/2008	626		4/14/2015	9290
4/28/2005	197		4/16/2009	514		4/7/2016	4
7/27/2005	213		4/16/2010	261		10/7/2016	56
10/27/2005	1310		4/12/2011	14		4/6/2017	3310
4/24/2006	1850		4/11/2012	4830			
7/19/2006	6350		4/5/2013	11000			

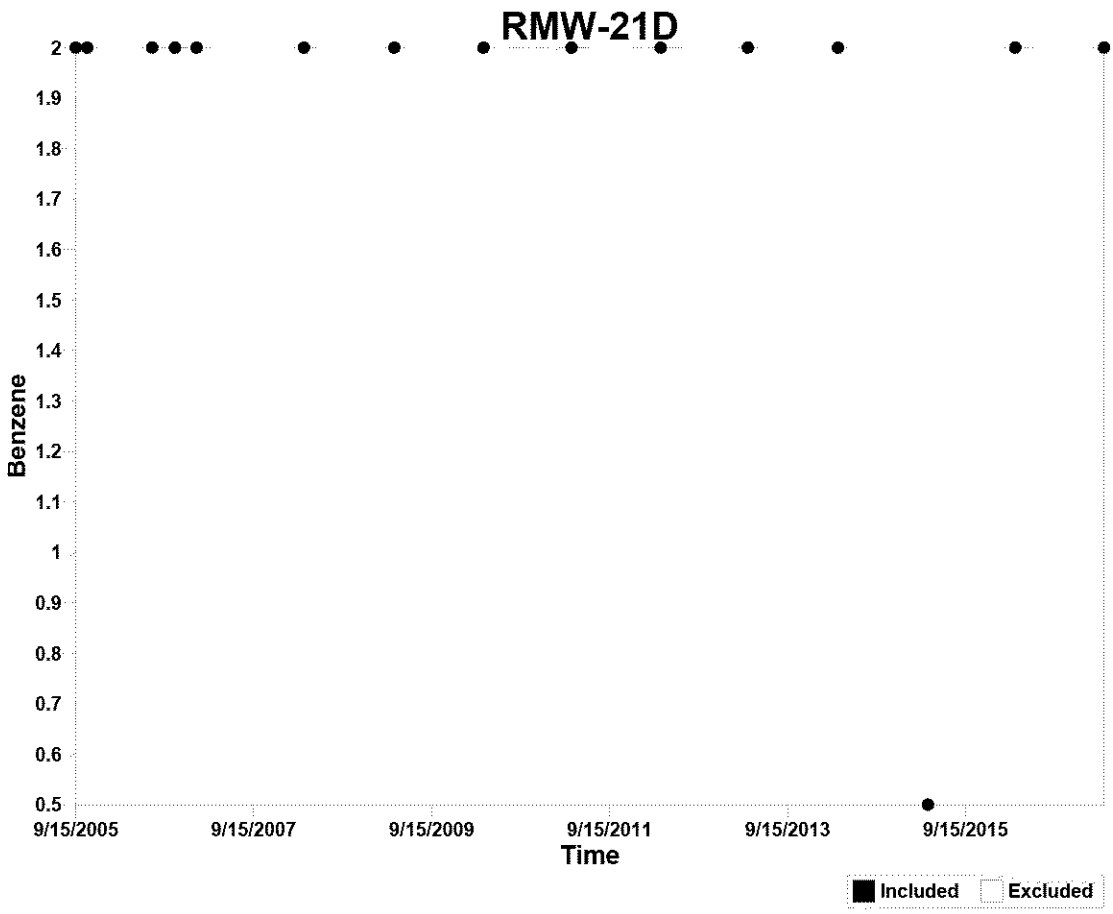
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-21C



RMW-21C							
Time	Value		Time	Value		Time	Value
9/15/2005	2		4/9/2008	2		4/5/2013	2
11/1/2005	2		4/15/2009	2		4/10/2014	2
7/26/2006	2		4/16/2010	2		4/14/2015	2
10/27/2006	2		4/12/2011	2		4/7/2016	2
1/24/2007	2		4/12/2012	2		4/6/2017	2

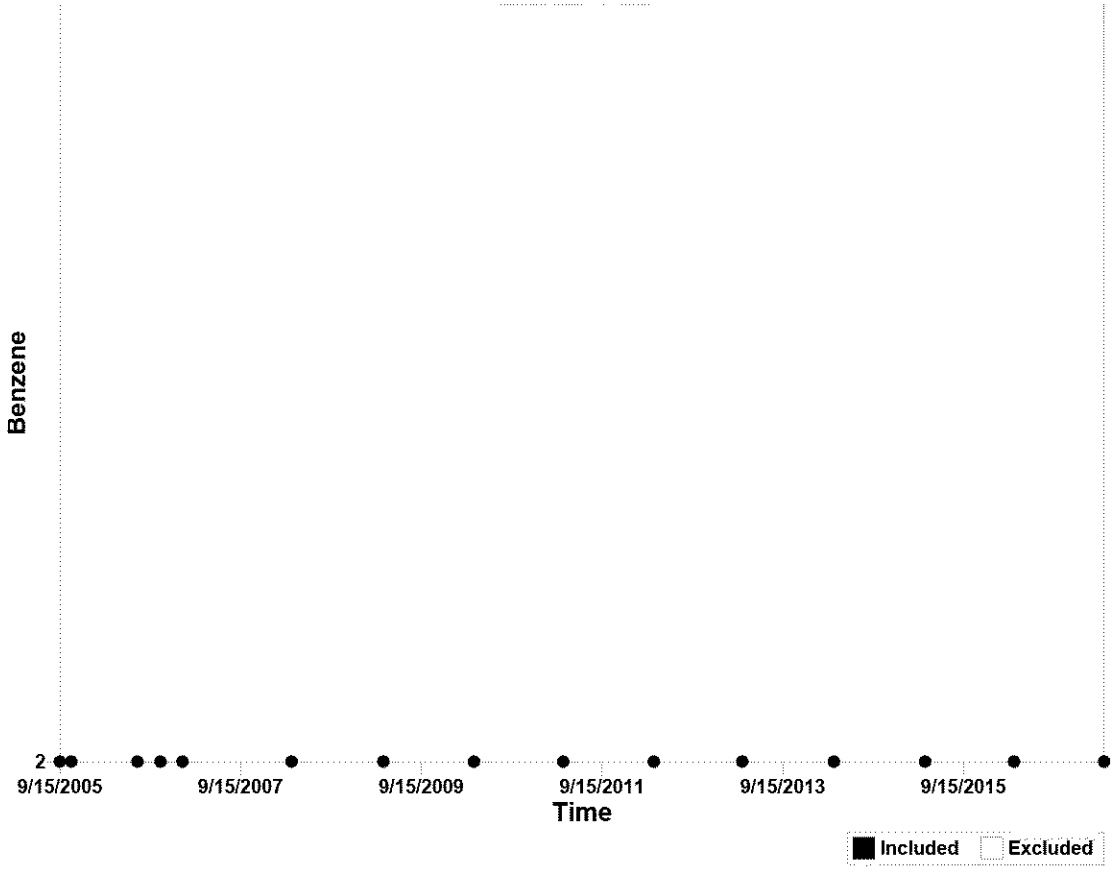
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-21D							
Time	Value		Time	Value		Time	Value
9/15/2005	2		4/9/2008	2		4/5/2013	2
11/1/2005	2		4/15/2009	2		4/10/2014	2
7/26/2006	2		4/16/2010	2		4/14/2015	0.5
10/27/2006	2		4/12/2011	2		4/7/2016	2
1/24/2007	2		4/12/2012	2		4/6/2017	2

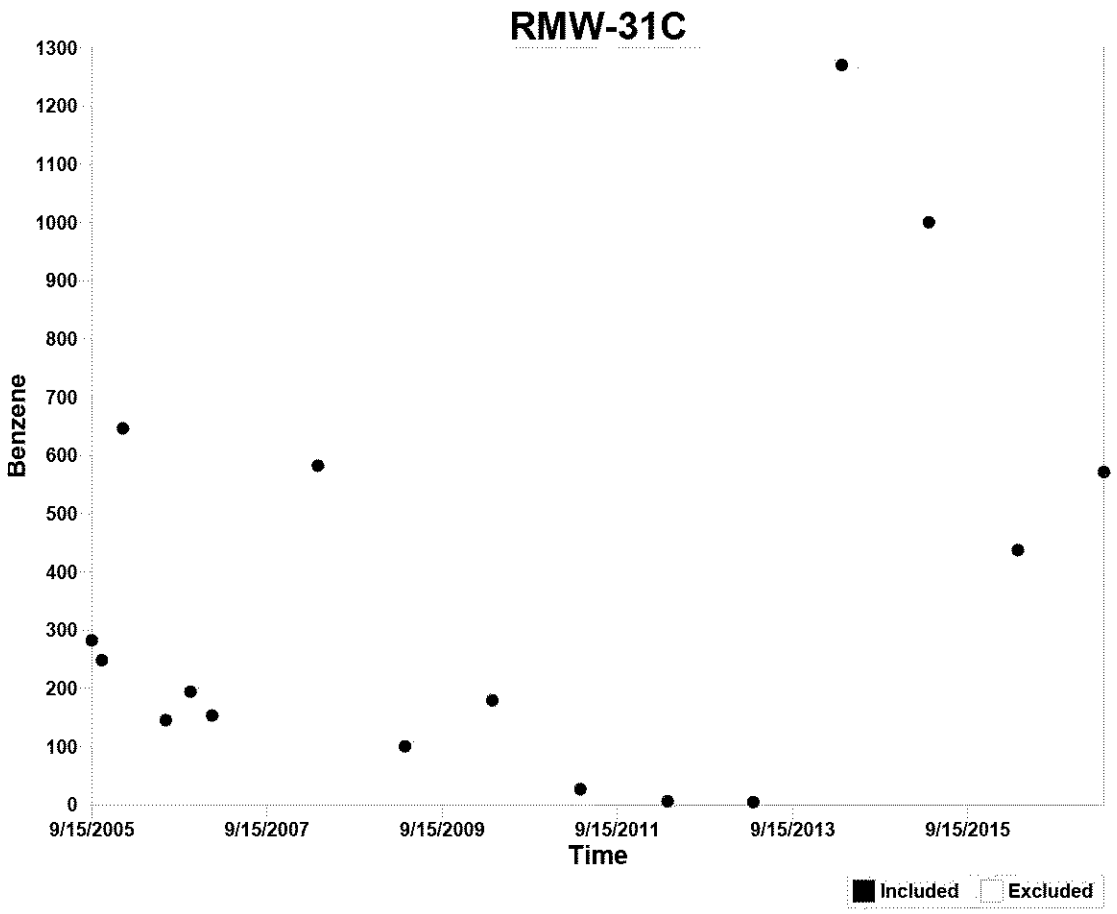
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-21E



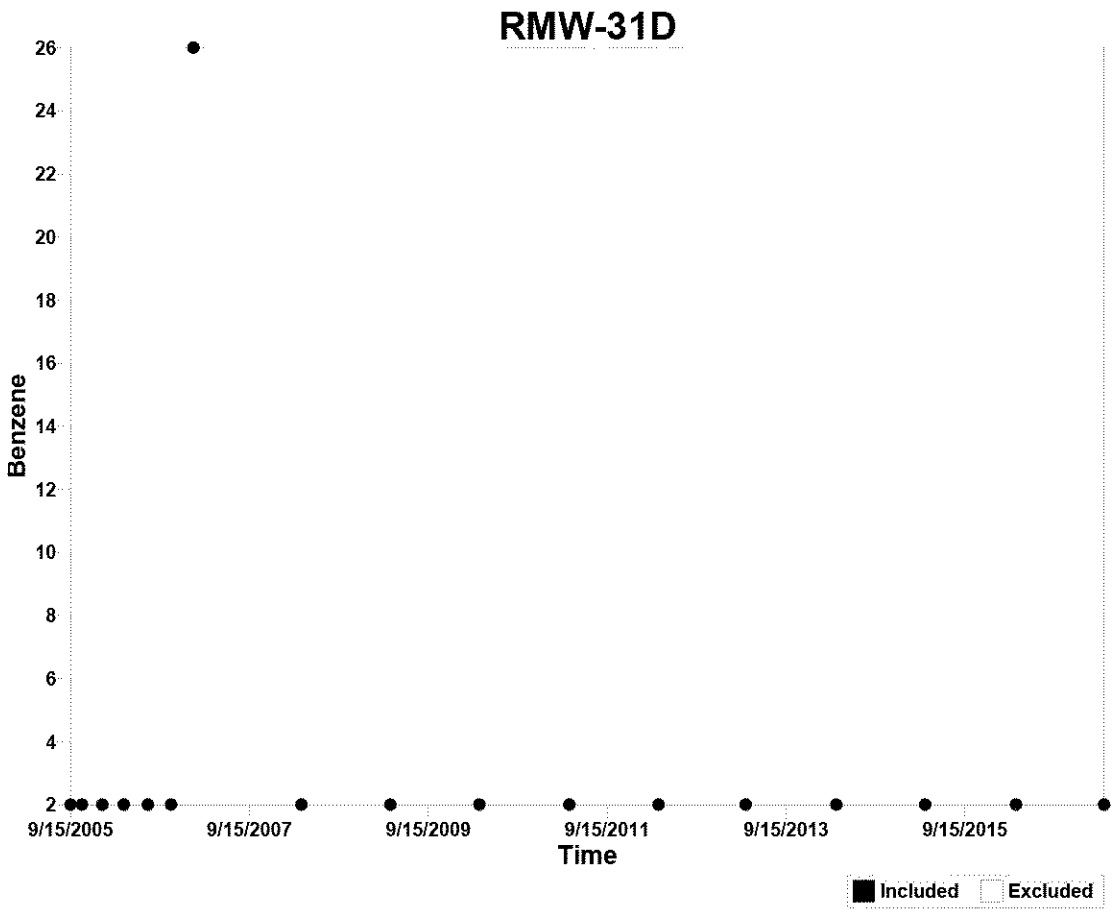
RMW-21E							
Time	Value		Time	Value		Time	Value
9/15/2005	2		4/9/2008	2		4/5/2013	2
11/1/2005	2		4/15/2009	2		4/10/2014	2
7/26/2006	2		4/16/2010	2		4/14/2015	2
10/27/2006	2		4/12/2011	2		4/7/2016	2
1/24/2007	2		4/12/2012	2		4/6/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-31C							
Time	Value		Time	Value		Time	Value
9/15/2005	282		4/15/2008	582		4/8/2014	1270
10/27/2005	248		4/13/2009	100		4/6/2015	1000
1/23/2006	646		4/12/2010	179		4/11/2016	437
7/21/2006	145		4/14/2011	26.4		4/5/2017	571
11/1/2006	194		4/12/2012	5.6			
1/30/2007	153		4/4/2013	4.2			

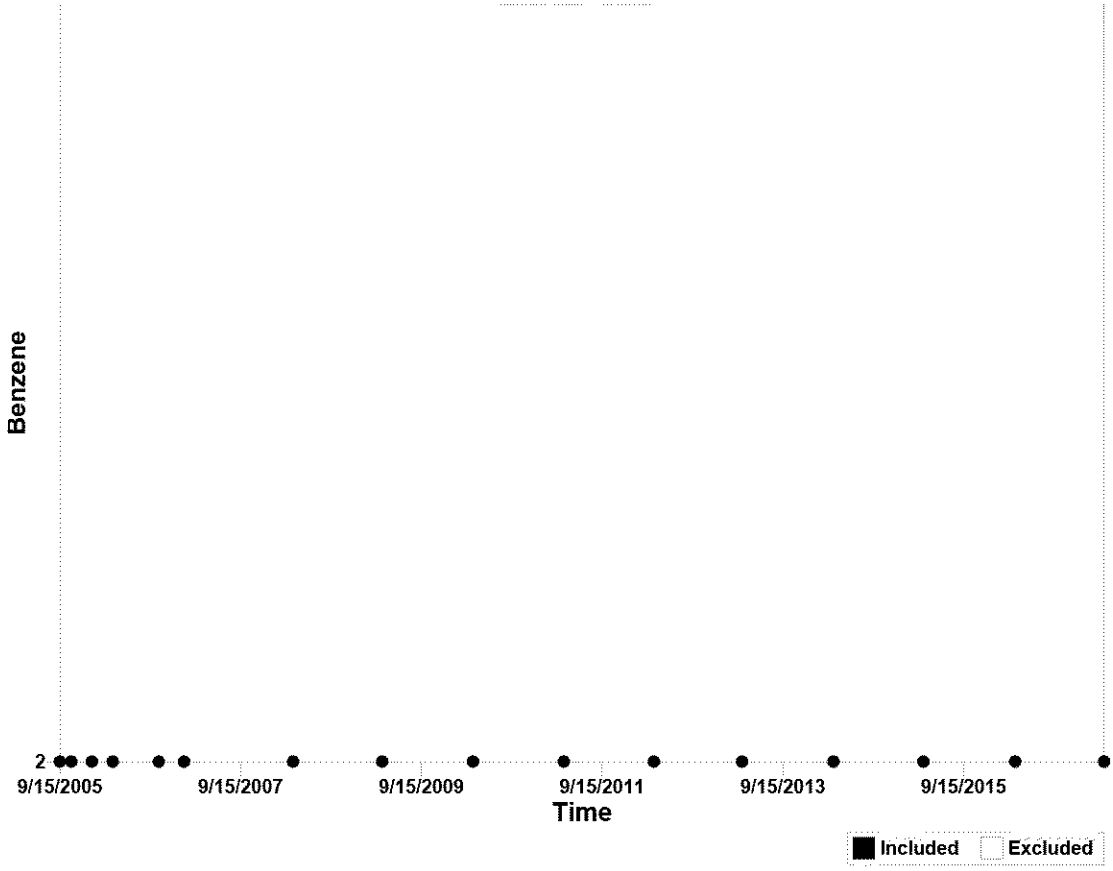
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-31D							
Time	Value		Time	Value		Time	Value
9/15/2005	2		1/30/2007	26		4/3/2013	2
11/1/2005	2		4/15/2008	2		4/8/2014	2
1/23/2006	2		4/13/2009	2		4/6/2015	2
4/21/2006	2		4/12/2010	2		4/11/2016	2
7/28/2006	2		4/14/2011	2		4/5/2017	2
10/31/2006	2		4/12/2012	2			

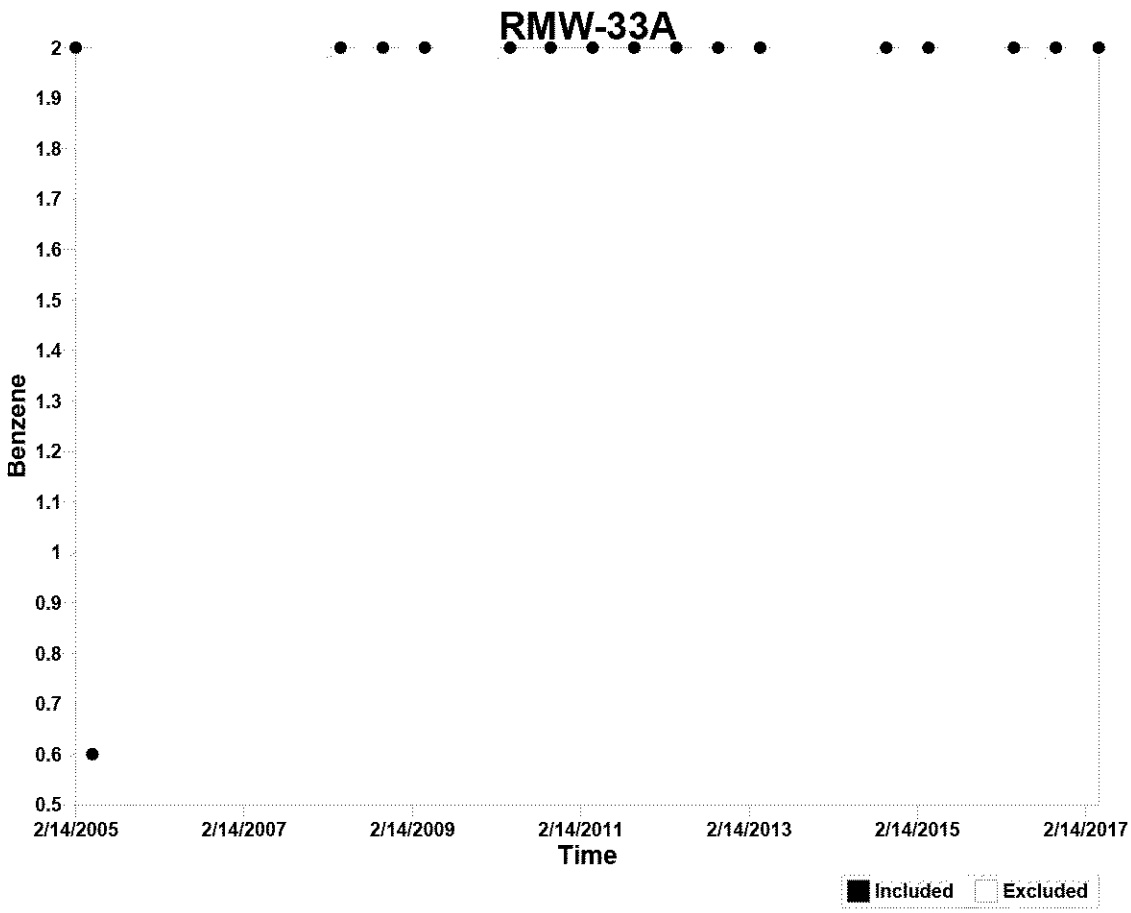
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-31E



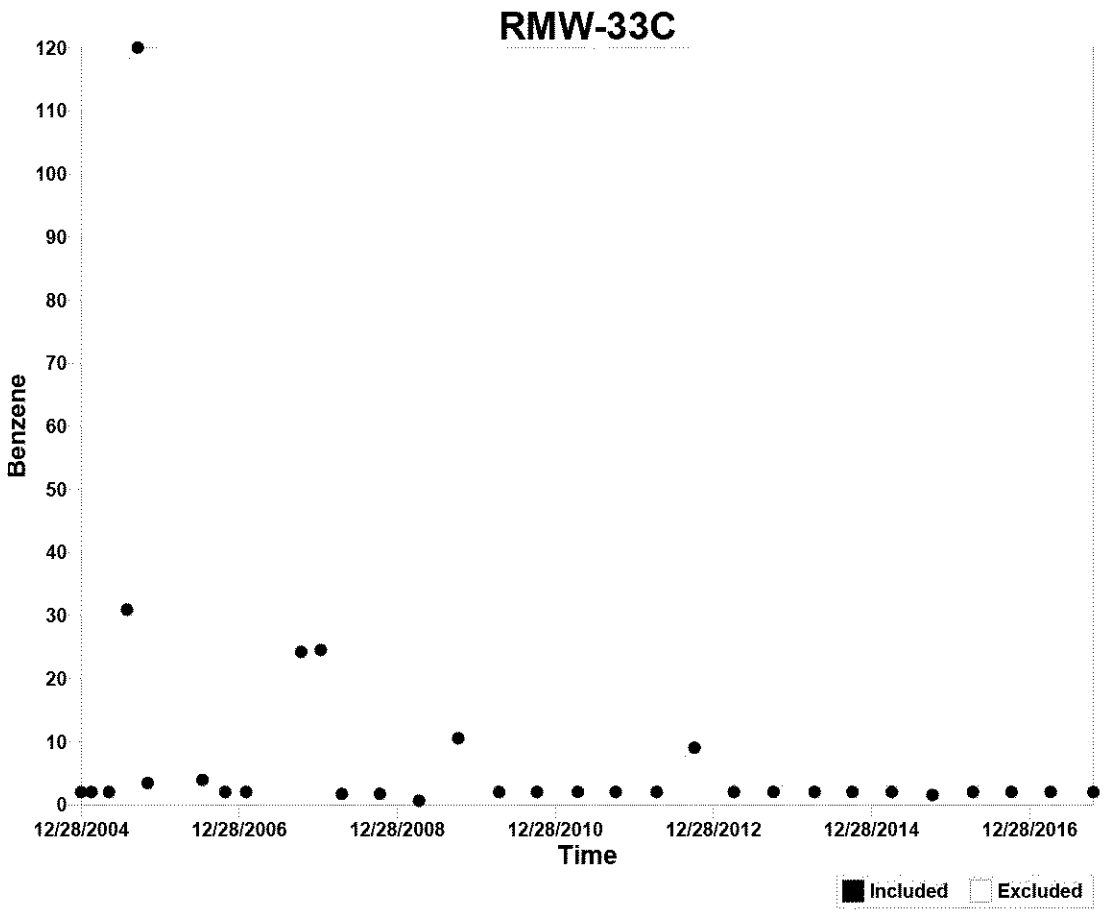
RMW-31E							
Time	Value		Time	Value		Time	Value
9/15/2005	2		4/15/2008	2		4/8/2014	2
11/1/2005	2		4/10/2009	2		4/6/2015	2
1/23/2006	2		4/12/2010	2		4/11/2016	2
4/17/2006	2		4/14/2011	2		4/5/2017	2
10/20/2006	2		4/12/2012	2			
1/30/2007	2		4/3/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



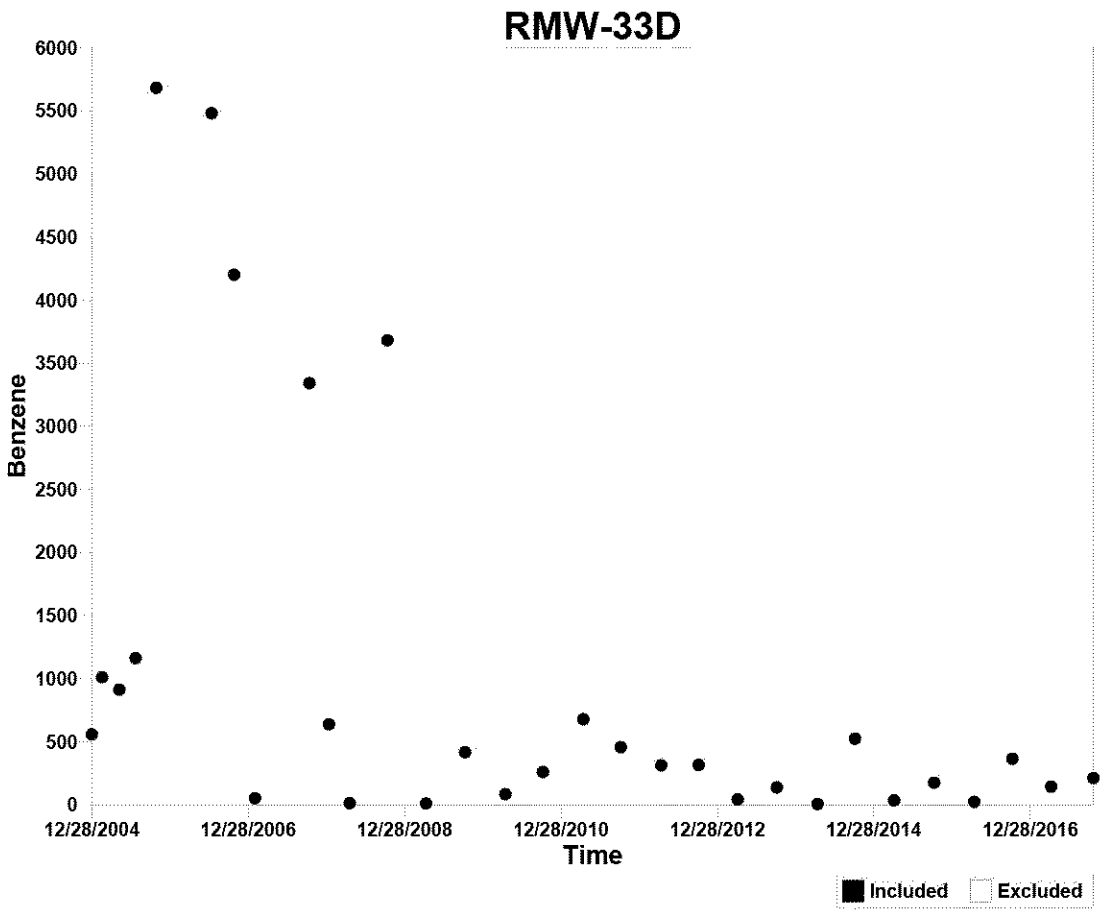
RMW-33A							
Time	Value		Time	Value		Time	Value
2/14/2005	2		10/7/2010	2		10/2/2014	2
4/27/2005	0.6		4/7/2011	2		4/3/2015	2
4/8/2008	2		10/5/2011	2		4/8/2016	2
10/9/2008	2		4/4/2012	2		10/7/2016	2
4/9/2009	2		10/3/2012	2		4/11/2017	2
4/14/2010	2		4/3/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



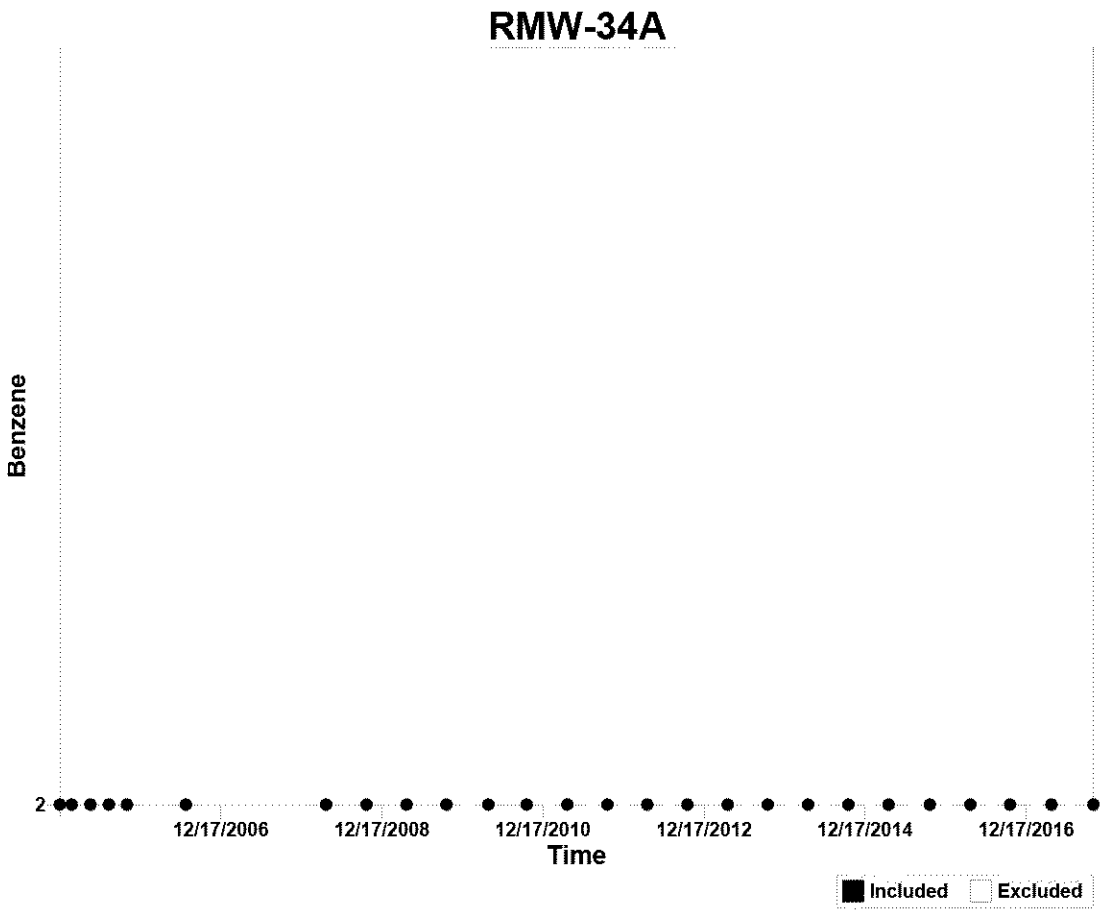
RMW-33C							
Time	Value		Time	Value		Time	Value
12/28/2004	2		4/16/2008	1.7		10/2/2013	2
2/14/2005	2		10/9/2008	1.7		4/10/2014	2
5/6/2005	2		4/8/2009	0.6		10/2/2014	2
7/28/2005	30.9		10/6/2009	10.5		4/2/2015	2
9/16/2005	120		4/13/2010	2		10/7/2015	1.5
11/1/2005	3.4		10/5/2010	2		4/11/2016	2
7/12/2006	3.9		4/12/2011	2		10/6/2016	2
10/25/2006	2		10/4/2011	2		4/5/2017	2
1/30/2007	2		4/10/2012	2		10/19/2017	2
10/11/2007	24.2		10/2/2012	9			
1/10/2008	24.5		4/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



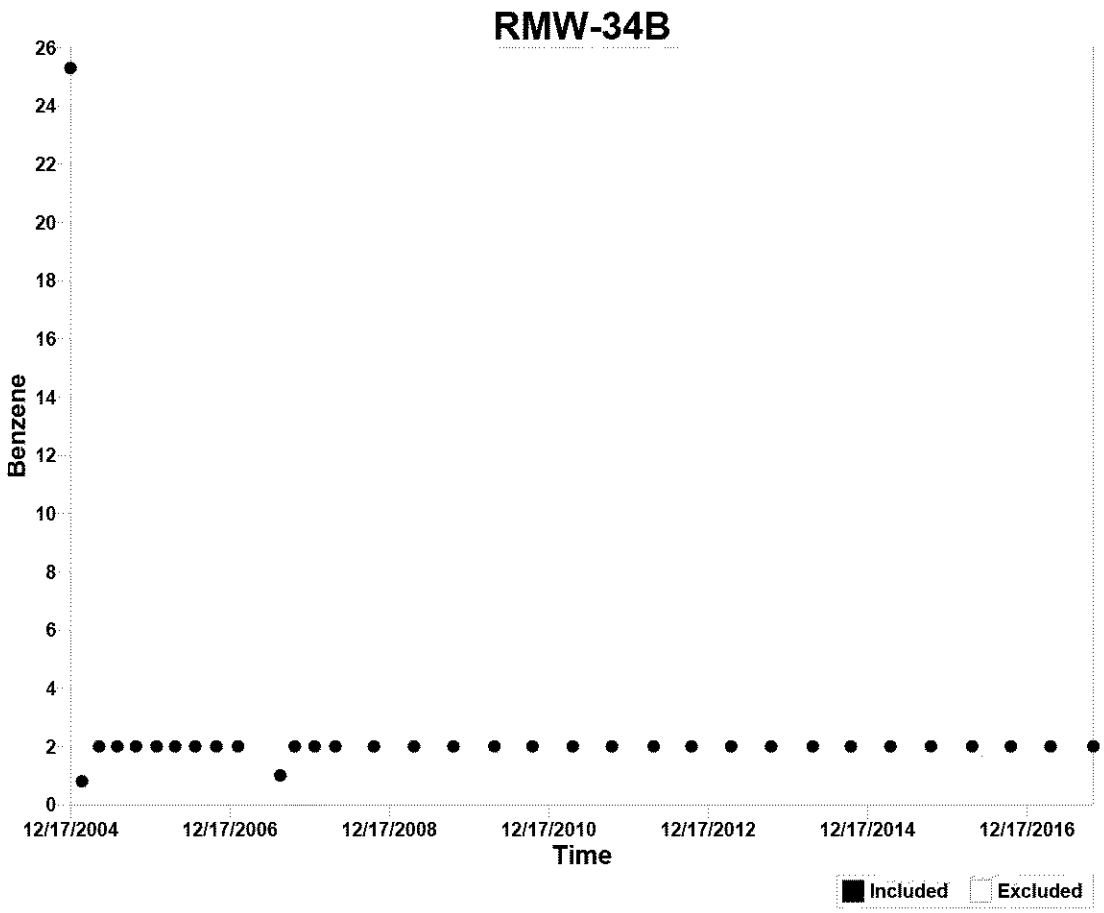
RMW-33D							
Time	Value		Time	Value		Time	Value
12/28/2004	557		4/16/2008	11.8		4/2/2013	40.6
2/14/2005	1010		10/9/2008	3680		10/2/2013	136
5/6/2005	911		4/8/2009	8.9		4/10/2014	4
7/21/2005	1160		10/7/2009	414		10/2/2014	522
10/26/2005	5680		4/13/2010	82.2		4/2/2015	33.6
7/11/2006	5480		10/5/2010	258		10/7/2015	173
10/24/2006	4200		4/12/2011	676		4/11/2016	21
1/30/2007	49.2		10/4/2011	455		10/6/2016	363
10/11/2007	3340		4/10/2012	311		4/5/2017	142
1/10/2008	636		10/2/2012	314		10/19/2017	210

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



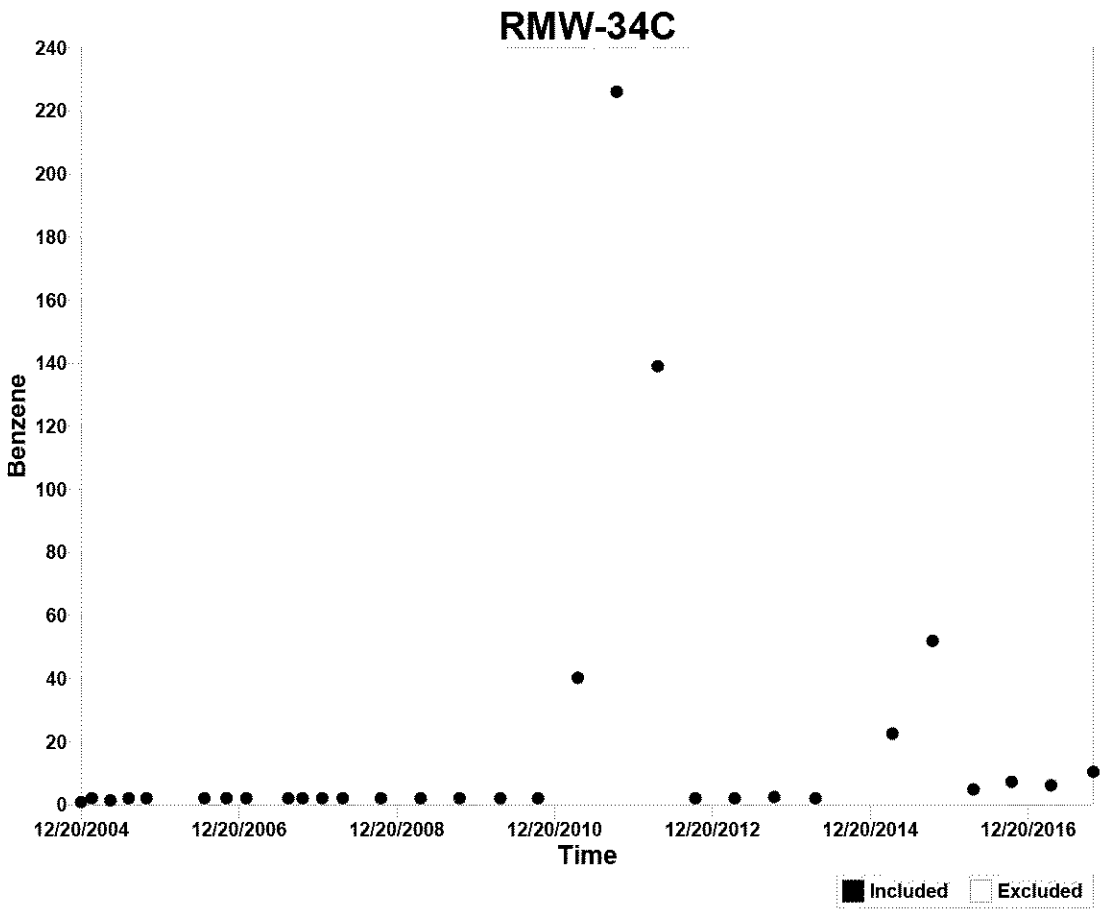
RMW-34A							
Time	Value		Time	Value		Time	Value
12/17/2004	2		10/6/2009	2		4/3/2014	2
2/9/2005	2		4/14/2010	2		10/3/2014	2
5/5/2005	2		10/5/2010	2		4/3/2015	2
7/28/2005	2		4/7/2011	2		10/7/2015	2
10/18/2005	2		10/6/2011	2		4/8/2016	2
7/12/2006	2		4/4/2012	2		10/5/2016	2
4/8/2008	2		10/3/2012	2		4/11/2017	2
10/8/2008	2		4/3/2013	2		10/18/2017	2
4/8/2009	2		10/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



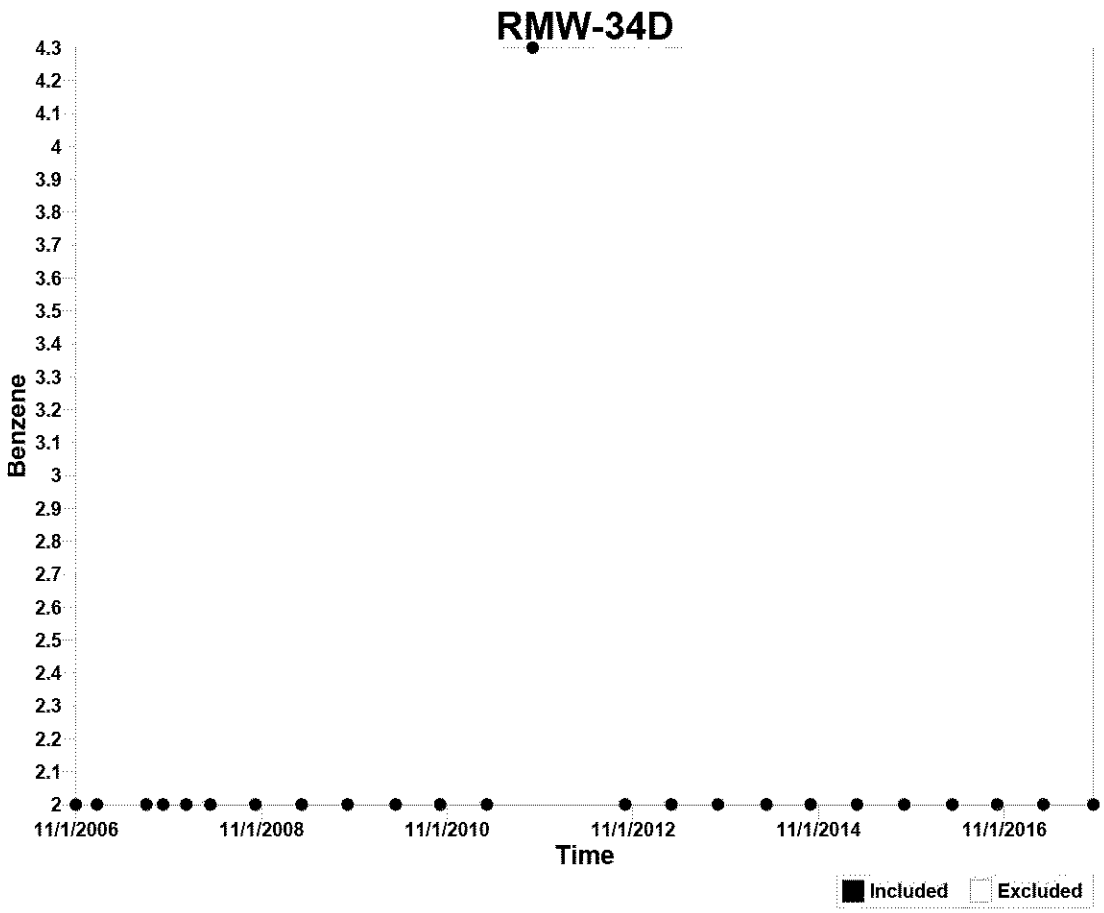
RMW-34B							
Time	Value		Time	Value		Time	Value
12/17/2004	25.3		10/11/2007	2		10/2/2012	2
2/8/2005	0.8		1/10/2008	2		4/2/2013	2
4/27/2005	2		4/14/2008	2		10/2/2013	2
7/20/2005	2		10/8/2008	2		4/11/2014	2
10/13/2005	2		4/9/2009	2		10/2/2014	2
1/16/2006	2		10/7/2009	2		4/2/2015	2
4/11/2006	2		4/13/2010	2		10/5/2015	2
7/12/2006	2		10/5/2010	2		4/11/2016	2
10/17/2006	2		4/7/2011	2		10/5/2016	2
1/24/2007	2		10/4/2011	2		4/5/2017	2
8/6/2007	1		4/12/2012	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-34C							
Time	Value		Time	Value		Time	Value
12/20/2004	0.8		1/10/2008	2		10/2/2012	2
2/8/2005	2		4/14/2008	2		4/2/2013	2
5/5/2005	1.3		10/8/2008	2		10/2/2013	2.4
7/28/2005	2		4/9/2009	2		4/11/2014	2
10/19/2005	2		10/7/2009	2		4/2/2015	22.5
7/14/2006	2		4/13/2010	2		10/5/2015	51.9
10/24/2006	2		10/5/2010	2		4/11/2016	4.8
1/24/2007	2		4/7/2011	40.2		10/5/2016	7.2
8/6/2007	2		10/4/2011	226		4/5/2017	6.1
10/11/2007	2		4/11/2012	139		10/18/2017	10.4

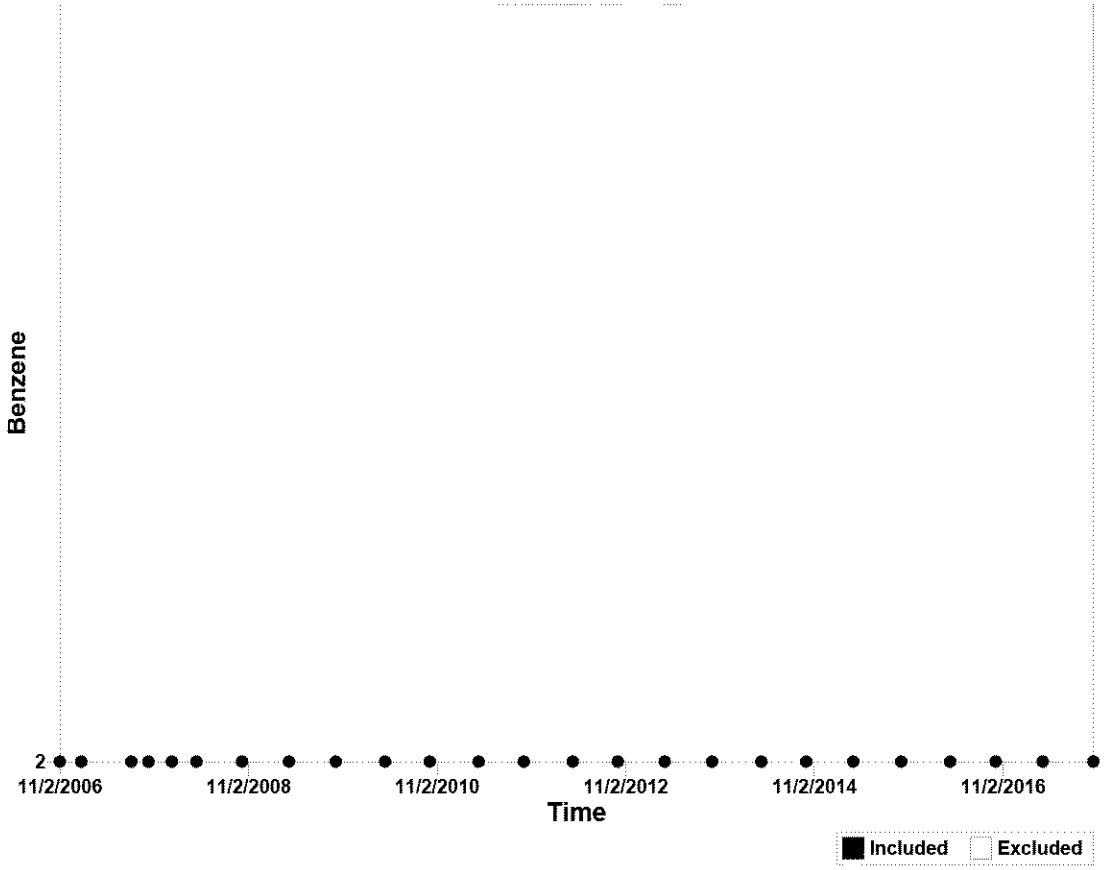
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-34D							
Time	Value		Time	Value		Time	Value
11/1/2006	2		10/6/2009	2		4/11/2014	2
1/24/2007	2		4/13/2010	2		10/2/2014	2
8/6/2007	2		10/5/2010	2		4/2/2015	2
10/11/2007	2		4/7/2011	2		10/5/2015	2
1/10/2008	2		10/4/2011	4.3		4/11/2016	2
4/14/2008	2		10/2/2012	2		10/5/2016	2
10/8/2008	2		4/2/2013	2		4/5/2017	2
4/8/2009	2		10/2/2013	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

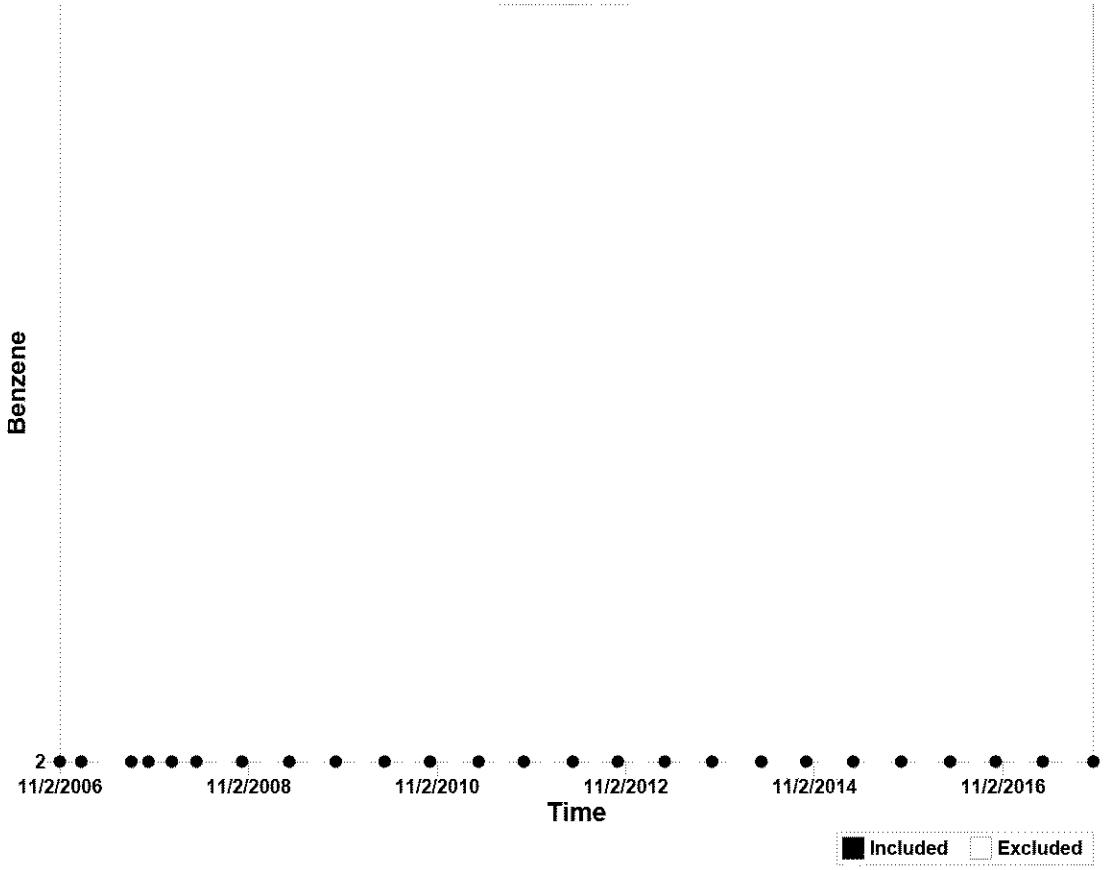
RMW-34E



RMW-34E							
Time	Value		Time	Value		Time	Value
11/2/2006	2		4/15/2010	2		10/2/2014	2
1/24/2007	2		10/5/2010	2		4/2/2015	2
8/6/2007	2		4/12/2011	2		10/5/2015	2
10/11/2007	2		10/4/2011	2		4/11/2016	2
1/10/2008	2		4/11/2012	2		10/5/2016	2
4/14/2008	2		10/2/2012	2		4/5/2017	2
10/8/2008	2		4/2/2013	2		10/18/2017	2
4/8/2009	2		10/2/2013	2			
10/6/2009	2		4/11/2014	2			

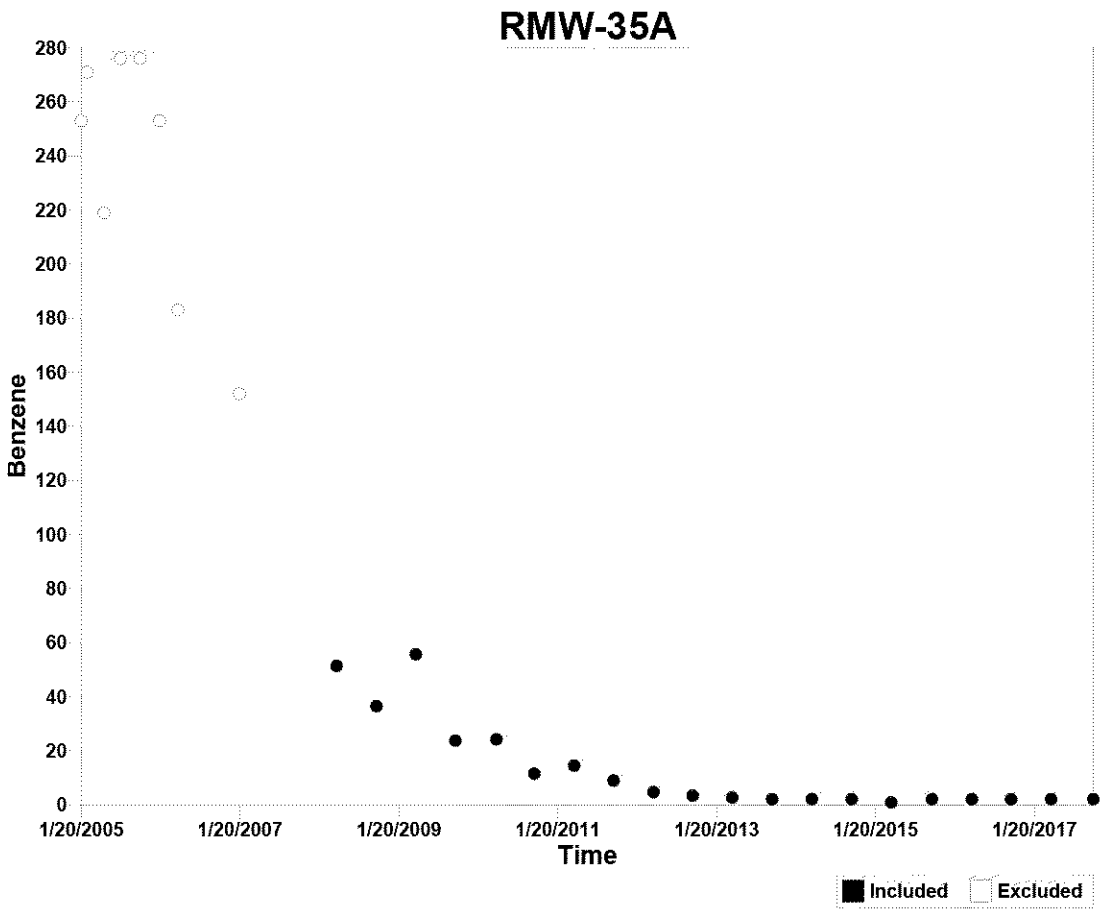
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-34F



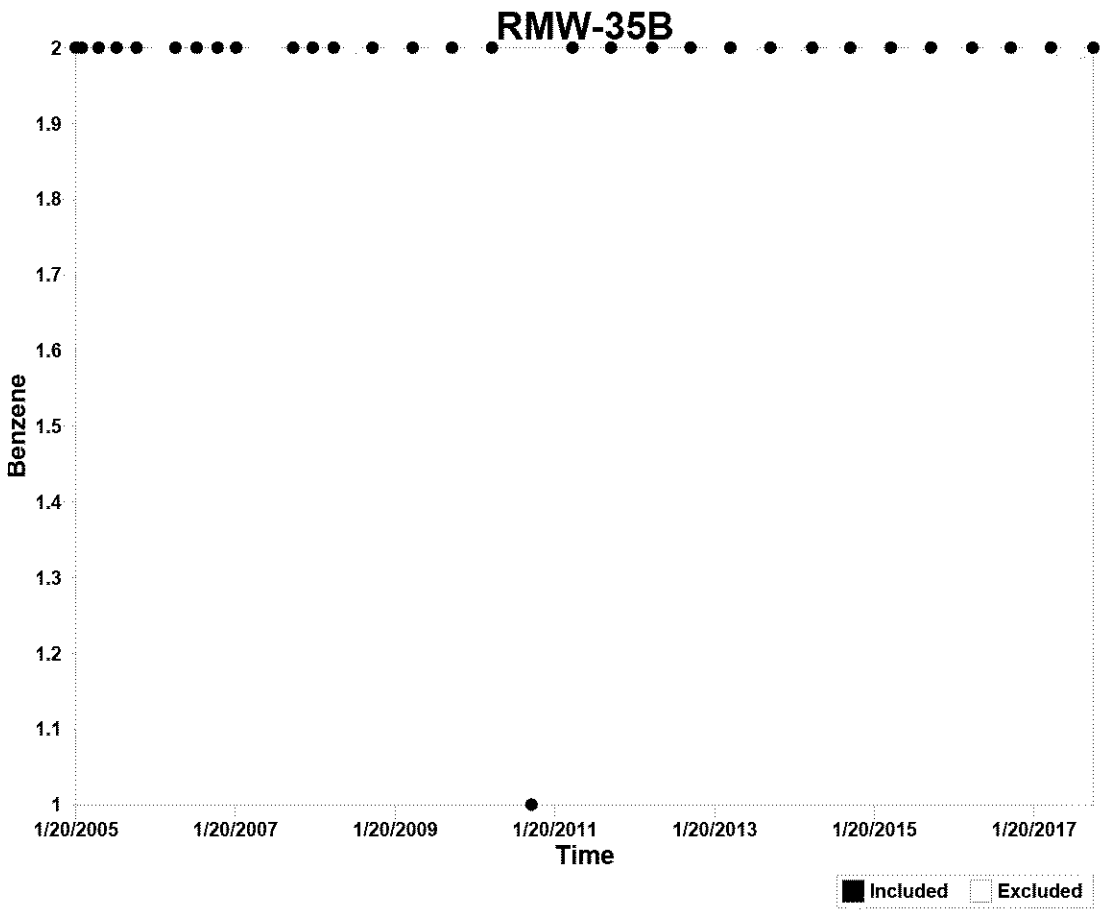
RMW-34F							
Time	Value		Time	Value		Time	Value
11/2/2006	2		4/13/2010	2		10/2/2014	2
1/24/2007	2		10/6/2010	2		4/2/2015	2
8/6/2007	2		4/12/2011	2		10/5/2015	2
10/11/2007	2		10/4/2011	2		4/11/2016	2
1/10/2008	2		4/11/2012	2		10/5/2016	2
4/14/2008	2		10/2/2012	2		4/5/2017	2
10/8/2008	2		4/2/2013	2		10/18/2017	2
4/9/2009	2		10/2/2013	2			
10/6/2009	2		4/11/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



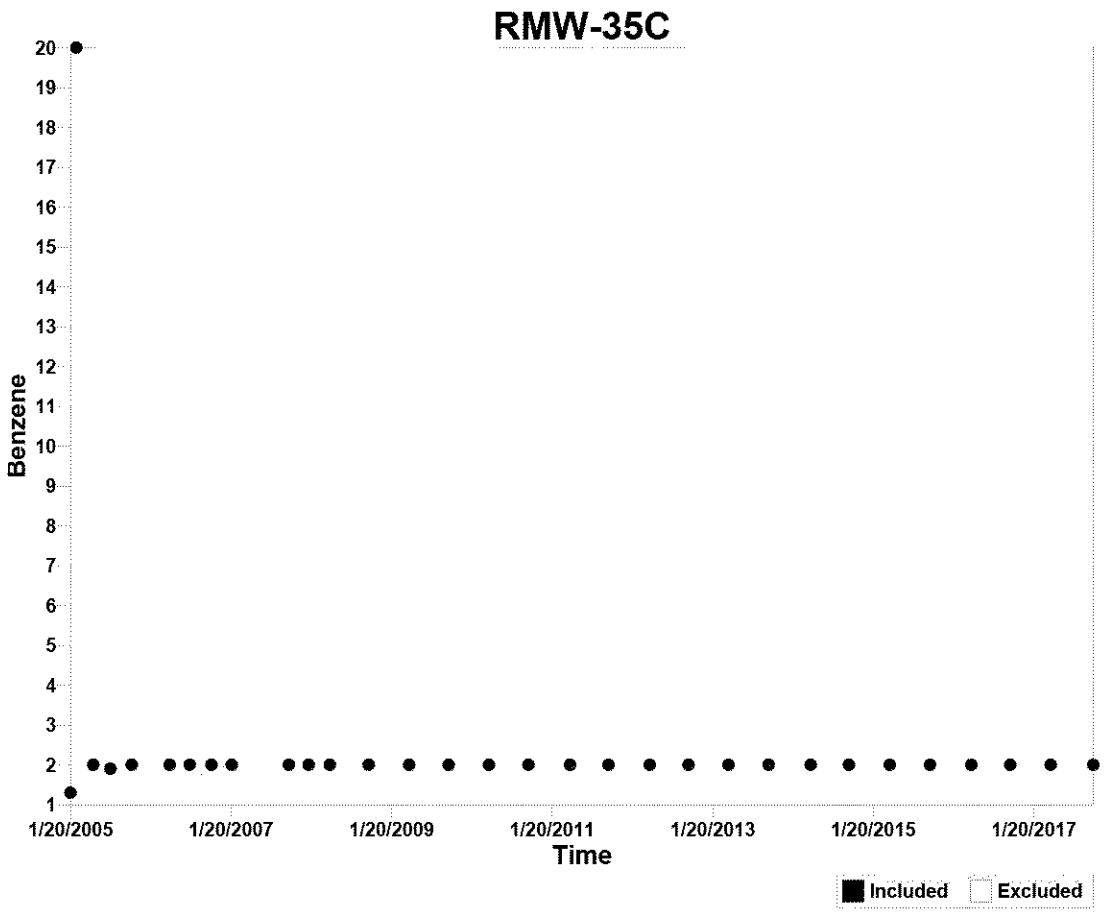
RMW-35A							
Time	Value		Time	Value		Time	Value
1/20/2005	*253*		4/8/2009	55.6		4/3/2014	2
2/16/2005	*271*		10/7/2009	23.7		10/3/2014	2
5/5/2005	*219*		4/14/2010	24.1		4/3/2015	0.8
7/19/2005	*276*		10/5/2010	11.4		10/7/2015	2
10/18/2005	*276*		4/6/2011	14.4		4/8/2016	2
1/16/2006	*253*		10/4/2011	8.9		10/5/2016	2
4/10/2006	*183*		4/5/2012	4.6		4/7/2017	2
1/18/2007	*152*		10/2/2012	3.3		10/18/2017	2
4/9/2008	51.3		4/2/2013	2.6			
10/9/2008	36.4		10/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



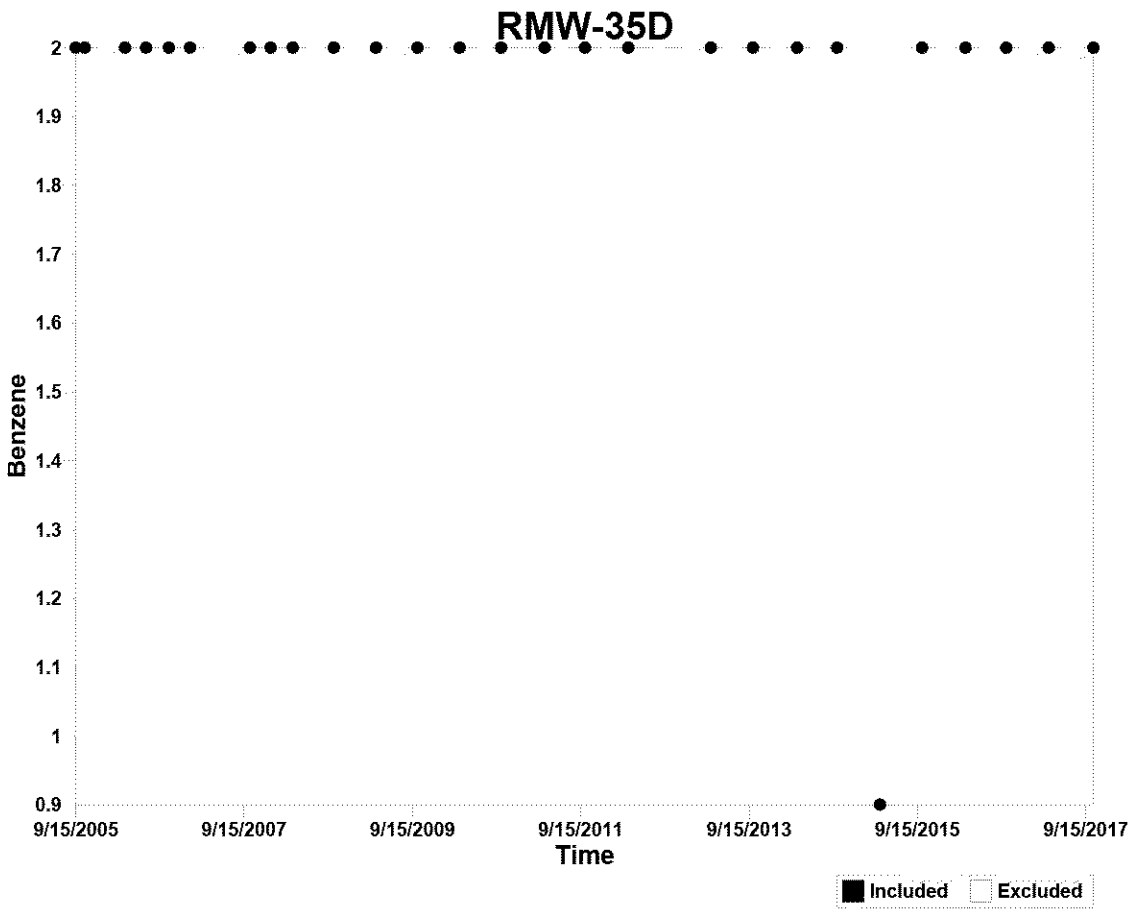
RMW-35B							
Time	Value		Time	Value		Time	Value
1/20/2005	2		4/14/2008	2		10/2/2013	2
2/16/2005	2		10/8/2008	2		4/11/2014	2
5/5/2005	2		4/10/2009	2		10/2/2014	2
7/26/2005	2		10/7/2009	2		4/6/2015	2
10/25/2005	2		4/8/2010	2		10/6/2015	2
4/21/2006	2		10/5/2010	1		4/11/2016	2
7/27/2006	2		4/11/2011	2		10/5/2016	2
10/31/2006	2		10/4/2011	2		4/7/2017	2
1/24/2007	2		4/9/2012	2		10/18/2017	2
10/11/2007	2		10/2/2012	2			
1/9/2008	2		4/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-35C							
Time	Value		Time	Value		Time	Value
1/20/2005	1.3		4/14/2008	2		10/2/2013	2
2/16/2005	20		10/8/2008	2		4/11/2014	2
5/4/2005	2		4/10/2009	2		10/2/2014	2
7/21/2005	1.9		10/7/2009	2		4/6/2015	2
10/26/2005	2		4/8/2010	2		10/6/2015	2
4/17/2006	2		10/5/2010	2		4/11/2016	2
7/17/2006	2		4/12/2011	2		10/5/2016	2
10/24/2006	2		10/4/2011	2		4/7/2017	2
1/24/2007	2		4/9/2012	2		10/18/2017	2
10/11/2007	2		10/2/2012	2			
1/9/2008	2		4/2/2013	2			

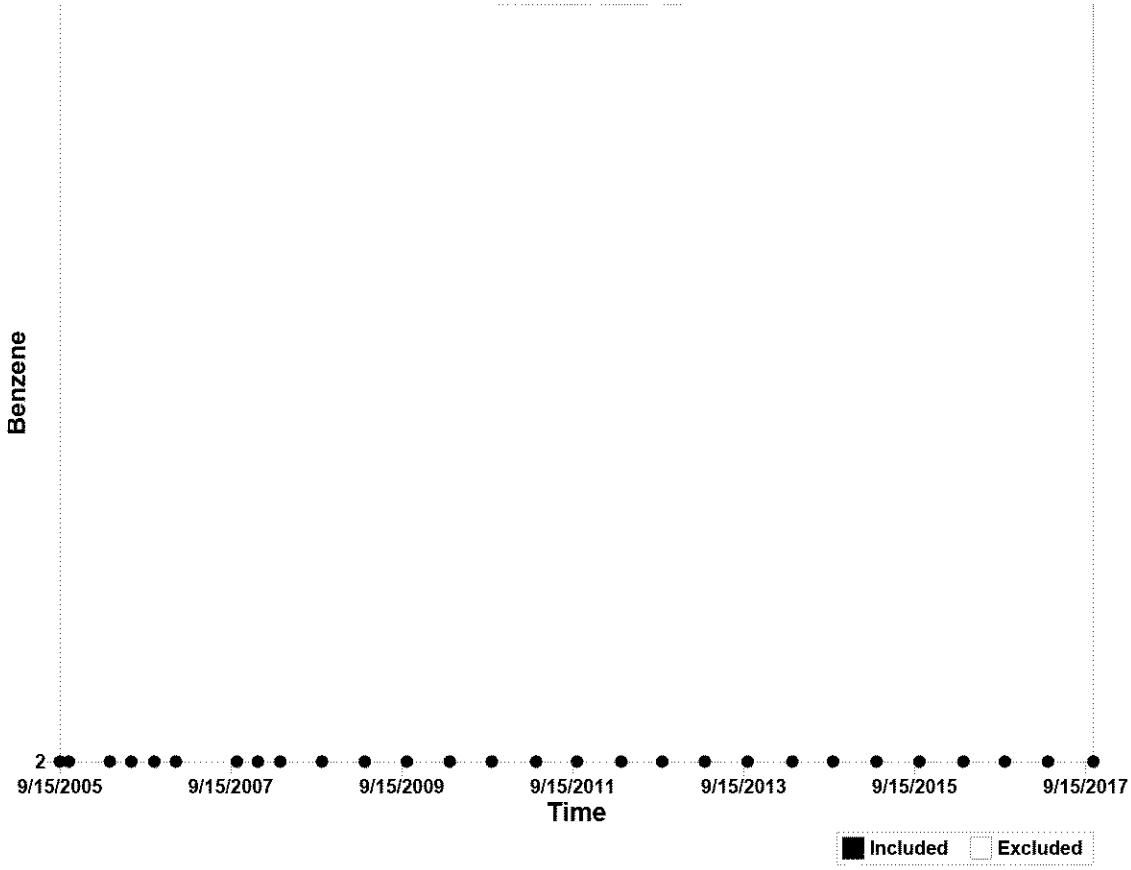
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-35D							
Time	Value		Time	Value		Time	Value
9/15/2005	2		10/9/2008	2		10/2/2013	2
10/24/2005	2		4/10/2009	2		4/11/2014	2
4/17/2006	2		10/7/2009	2		10/2/2014	2
7/17/2006	2		4/8/2010	2		4/6/2015	0.9
10/24/2006	2		10/5/2010	2		10/6/2015	2
1/24/2007	2		4/12/2011	2		4/11/2016	2
10/11/2007	2		10/4/2011	2		10/5/2016	2
1/9/2008	2		4/9/2012	2		4/7/2017	2
4/14/2008	2		4/2/2013	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

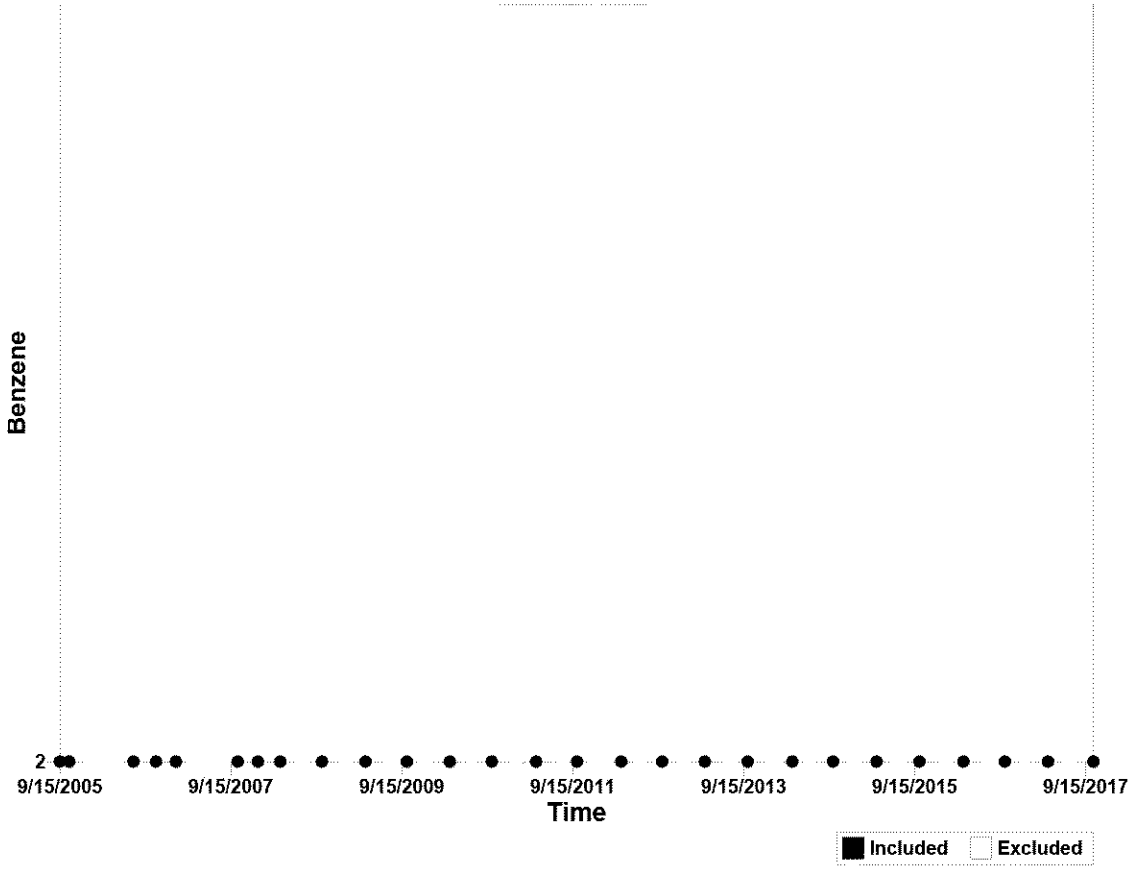
RMW-35E



RMW-35E							
Time	Value		Time	Value		Time	Value
9/15/2005	2		4/10/2009	2		4/11/2014	2
10/24/2005	2		10/7/2009	2		10/2/2014	2
4/17/2006	2		4/8/2010	2		4/6/2015	2
7/18/2006	2		10/5/2010	2		10/6/2015	2
10/24/2006	2		4/12/2011	2		4/11/2016	2
1/24/2007	2		10/4/2011	2		10/5/2016	2
10/12/2007	2		4/10/2012	2		4/7/2017	2
1/9/2008	2		10/2/2012	2		10/18/2017	2
4/14/2008	2		4/2/2013	2			
10/9/2008	2		10/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

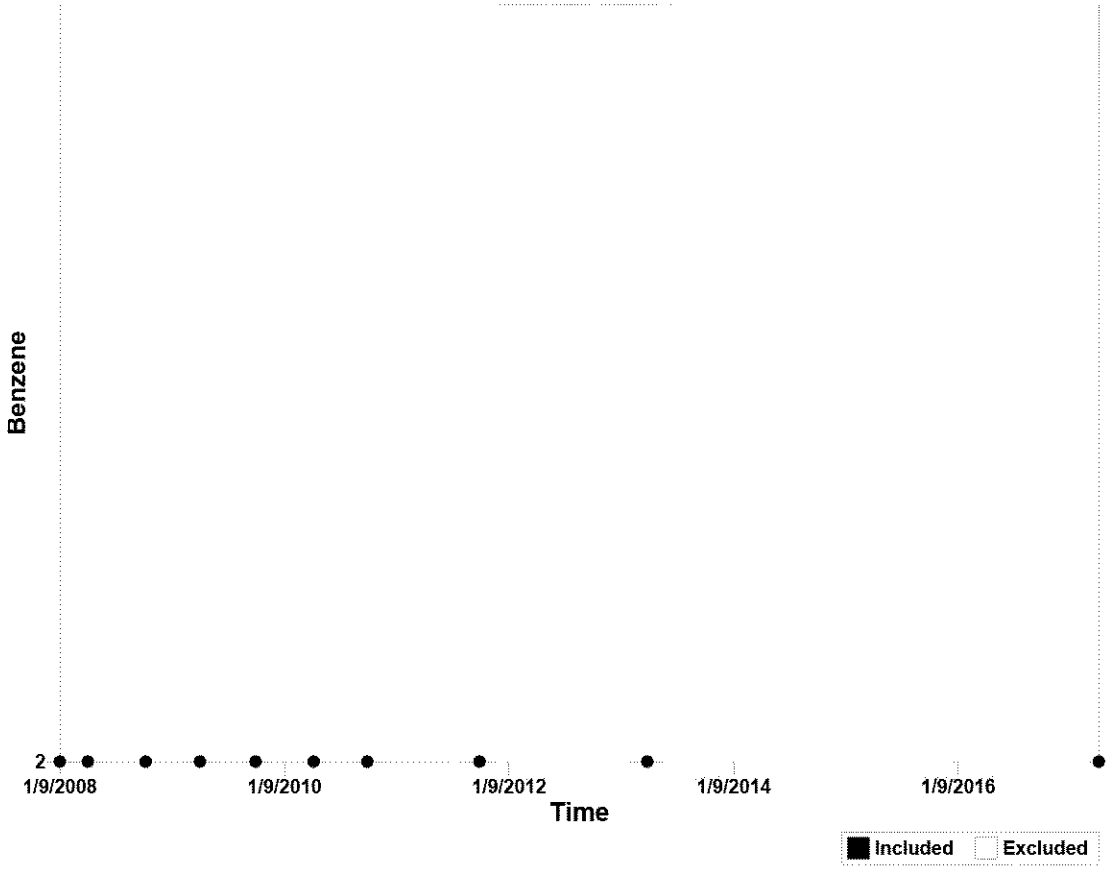
RMW-35F



RMW-35F							
Time	Value		Time	Value		Time	Value
9/15/2005	2		4/13/2009	2		10/2/2013	2
10/25/2005	2		10/7/2009	2		4/11/2014	2
7/27/2006	2		4/8/2010	2		10/2/2014	2
10/31/2006	2		10/5/2010	2		4/6/2015	2
1/24/2007	2		4/12/2011	2		10/6/2015	2
10/15/2007	2		10/4/2011	2		4/11/2016	2
1/9/2008	2		4/10/2012	2		10/5/2016	2
4/14/2008	2		10/2/2012	2		4/7/2017	2
10/9/2008	2		4/2/2013	2		10/18/2017	2

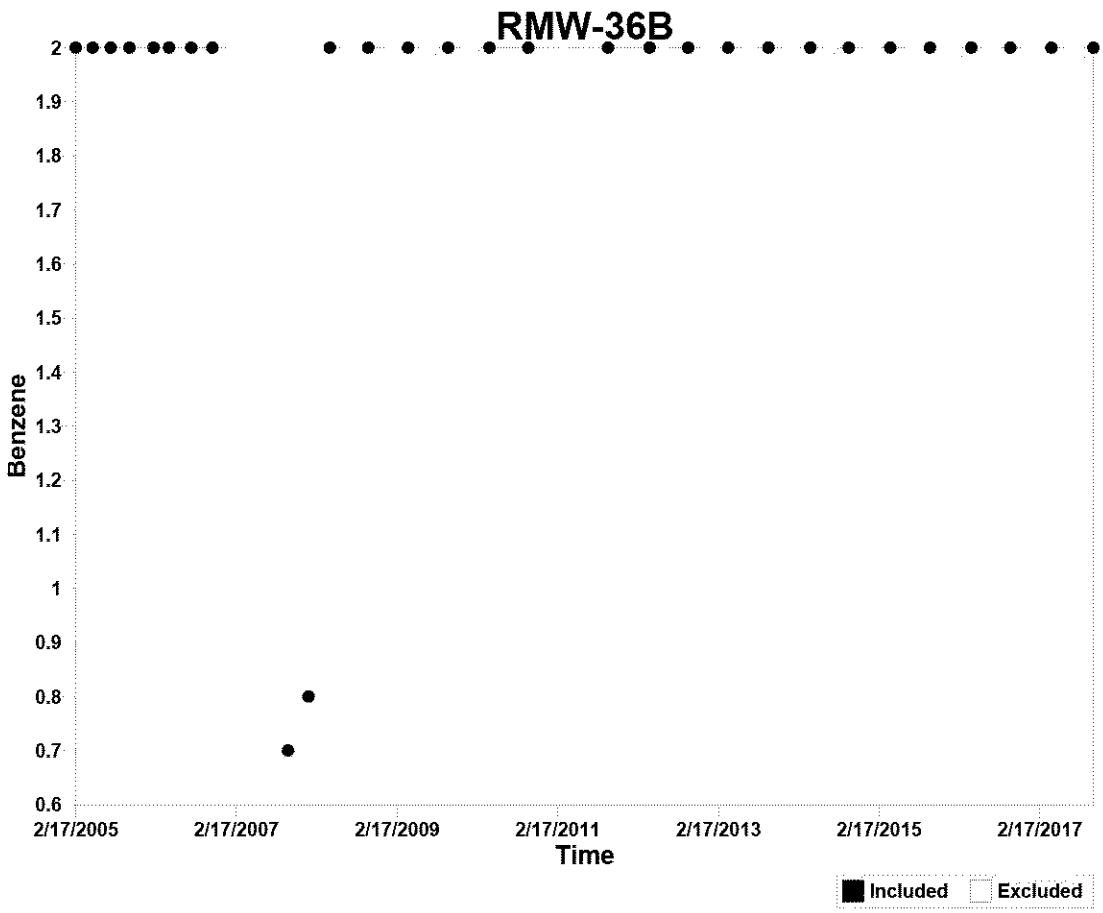
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-36A



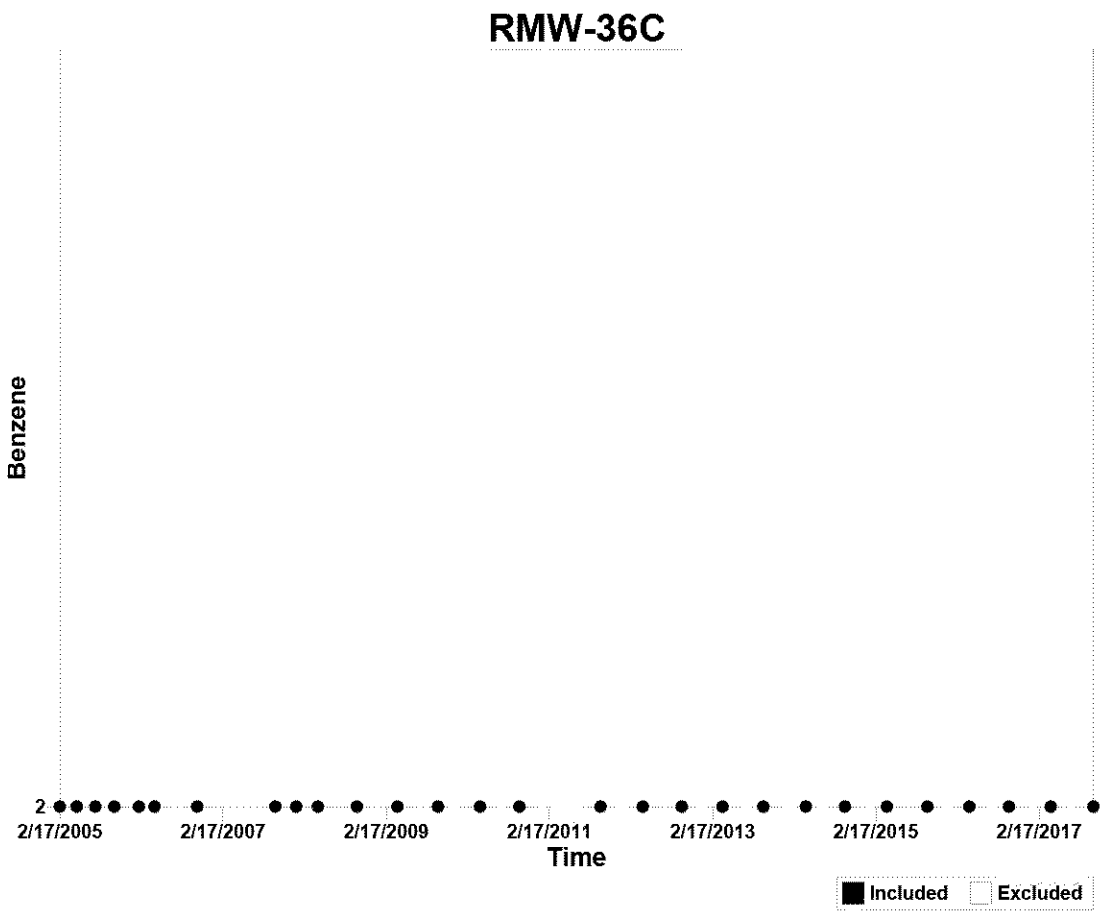
RMW-36A							
Time	Value		Time	Value		Time	Value
1/9/2008	2		10/7/2009	2		4/3/2013	2
4/9/2008	2		4/14/2010	2		4/10/2017	2
10/14/2008	2		10/5/2010	2			
4/9/2009	2		10/5/2011	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



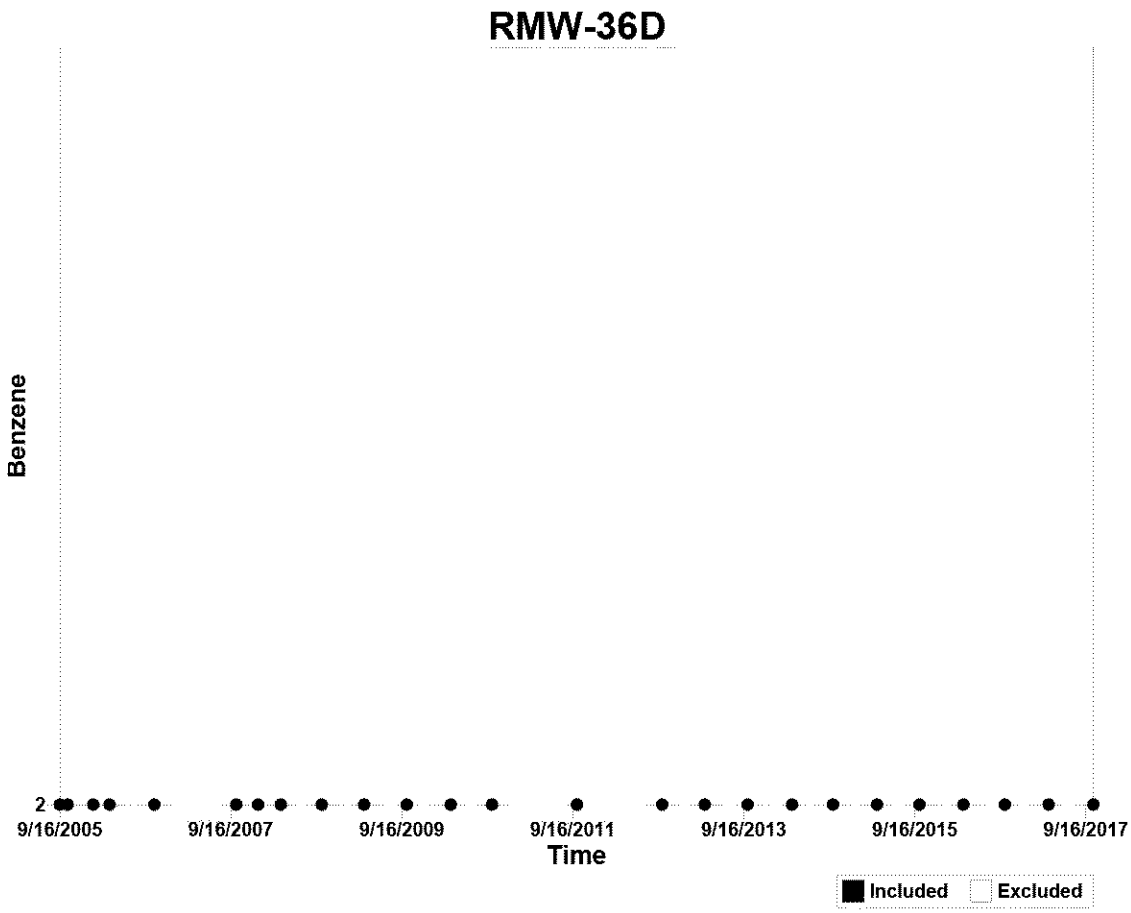
RMW-36B							
Time	Value		Time	Value		Time	Value
2/17/2005	2		4/17/2008	2		10/2/2013	2
5/5/2005	2		10/9/2008	2		4/10/2014	2
7/26/2005	2		4/8/2009	2		10/2/2014	2
10/19/2005	2		10/7/2009	2		4/8/2015	2
2/6/2006	2		4/13/2010	2		10/6/2015	2
4/17/2006	2		10/6/2010	2		4/11/2016	2
7/27/2006	2		10/4/2011	2		10/5/2016	2
10/31/2006	2		4/10/2012	2		4/10/2017	2
10/10/2007	0.7		10/2/2012	2		10/18/2017	2
1/11/2008	0.8		4/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-36C							
Time	Value		Time	Value		Time	Value
2/17/2005	2		10/9/2008	2		4/10/2014	2
5/4/2005	2		4/8/2009	2		10/2/2014	2
7/26/2005	2		10/7/2009	2		4/8/2015	2
10/19/2005	2		4/13/2010	2		10/6/2015	2
2/6/2006	2		10/6/2010	2		4/11/2016	2
4/17/2006	2		10/4/2011	2		10/5/2016	2
10/25/2006	2		4/10/2012	2		4/10/2017	2
10/10/2007	2		10/2/2012	2		10/18/2017	2
1/11/2008	2		4/2/2013	2			
4/17/2008	2		10/2/2013	2			

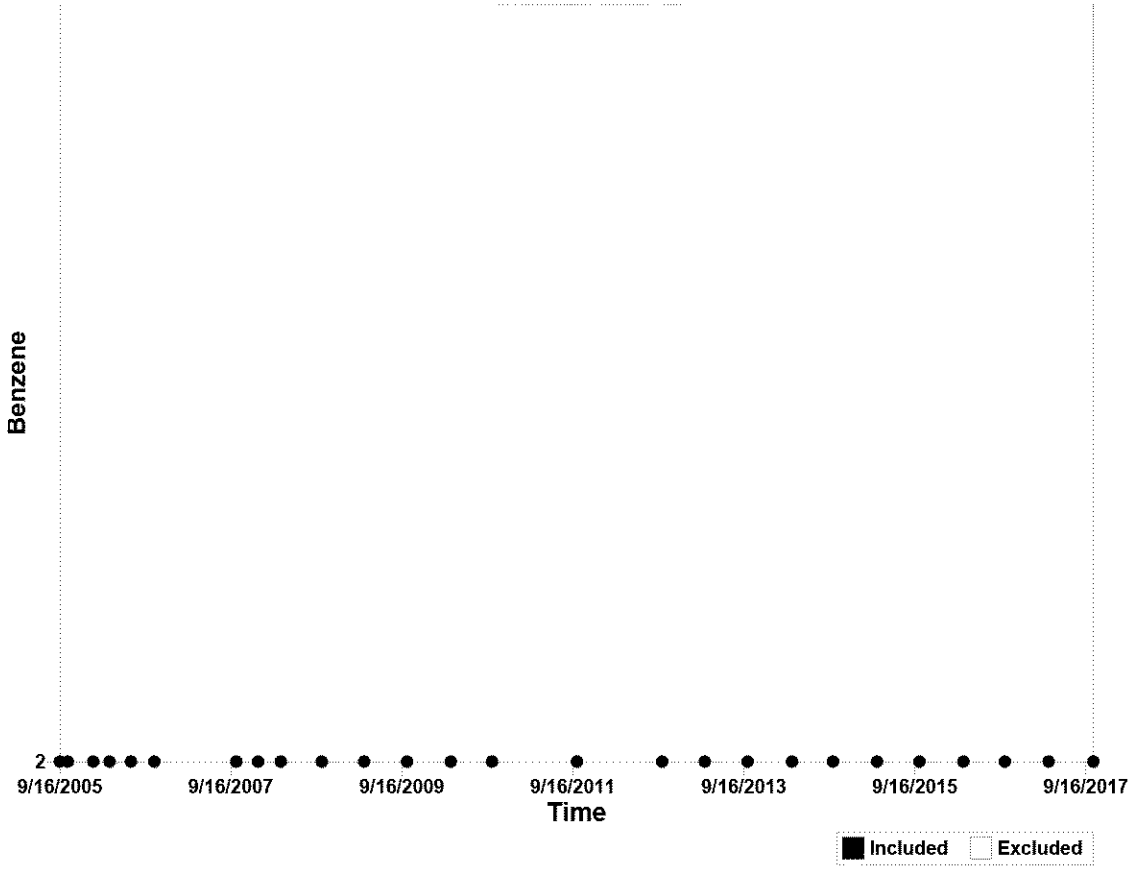
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-36D							
Time	Value		Time	Value		Time	Value
9/16/2005	2		4/8/2009	2		10/2/2014	2
10/19/2005	2		10/7/2009	2		4/8/2015	2
2/6/2006	2		4/13/2010	2		10/6/2015	2
4/17/2006	2		10/6/2010	2		4/11/2016	2
10/25/2006	2		10/4/2011	2		10/5/2016	2
10/10/2007	2		10/2/2012	2		4/10/2017	2
1/11/2008	2		4/2/2013	2		10/18/2017	2
4/17/2008	2		10/2/2013	2			
10/9/2008	2		4/10/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

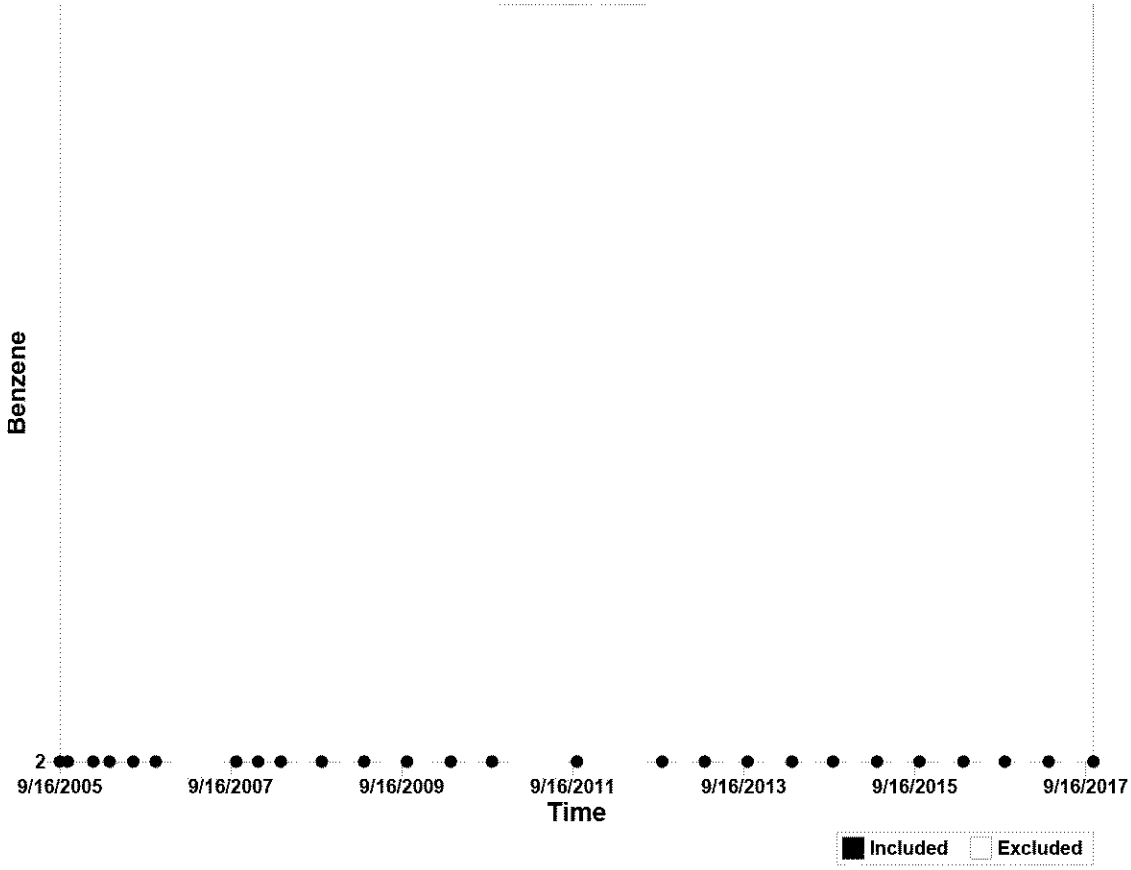
RMW-36E



RMW-36E							
Time	Value		Time	Value		Time	Value
9/16/2005	2		10/9/2008	2		4/10/2014	2
10/20/2005	2		4/8/2009	2		10/2/2014	2
2/6/2006	2		10/8/2009	2		4/8/2015	2
4/17/2006	2		4/13/2010	2		10/6/2015	2
7/17/2006	2		10/6/2010	2		4/11/2016	2
10/25/2006	2		10/4/2011	2		10/5/2016	2
10/10/2007	2		10/2/2012	2		4/10/2017	2
1/11/2008	2		4/2/2013	2		10/18/2017	2
4/17/2008	2		10/2/2013	2			

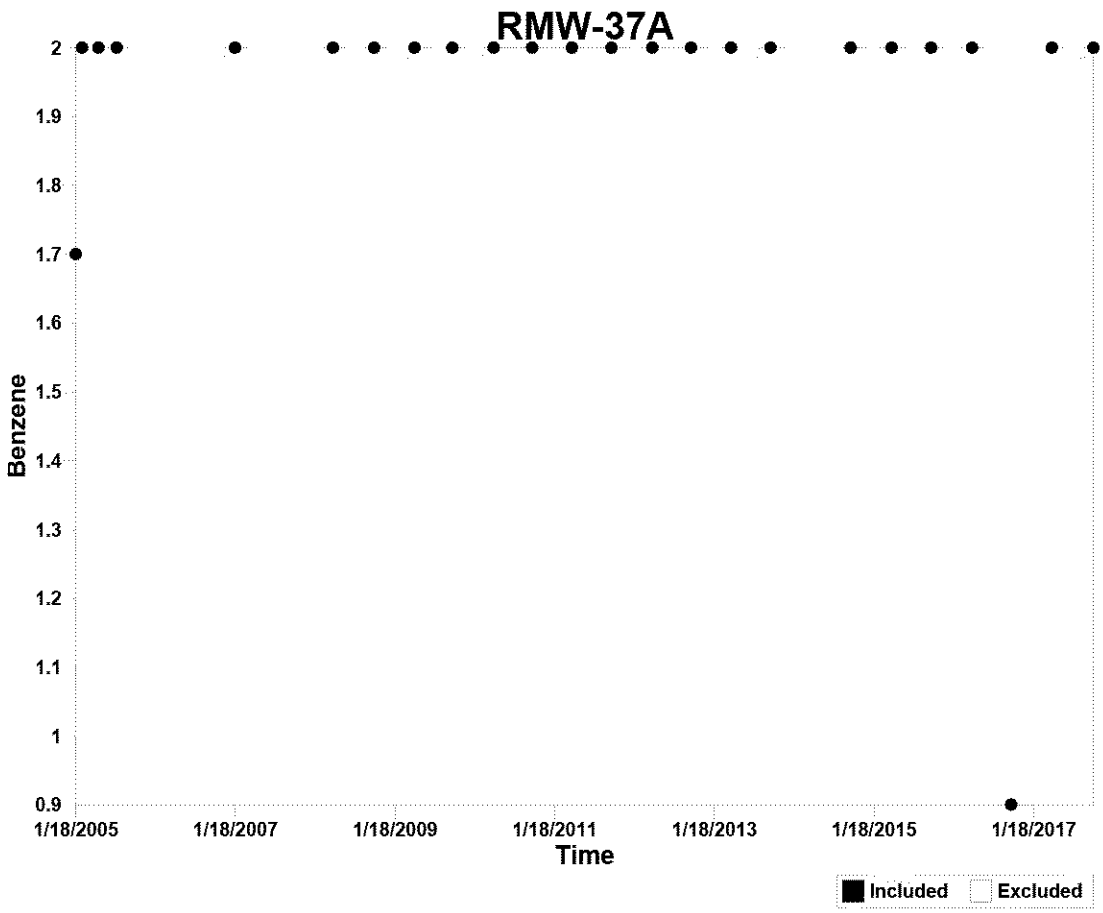
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-36F



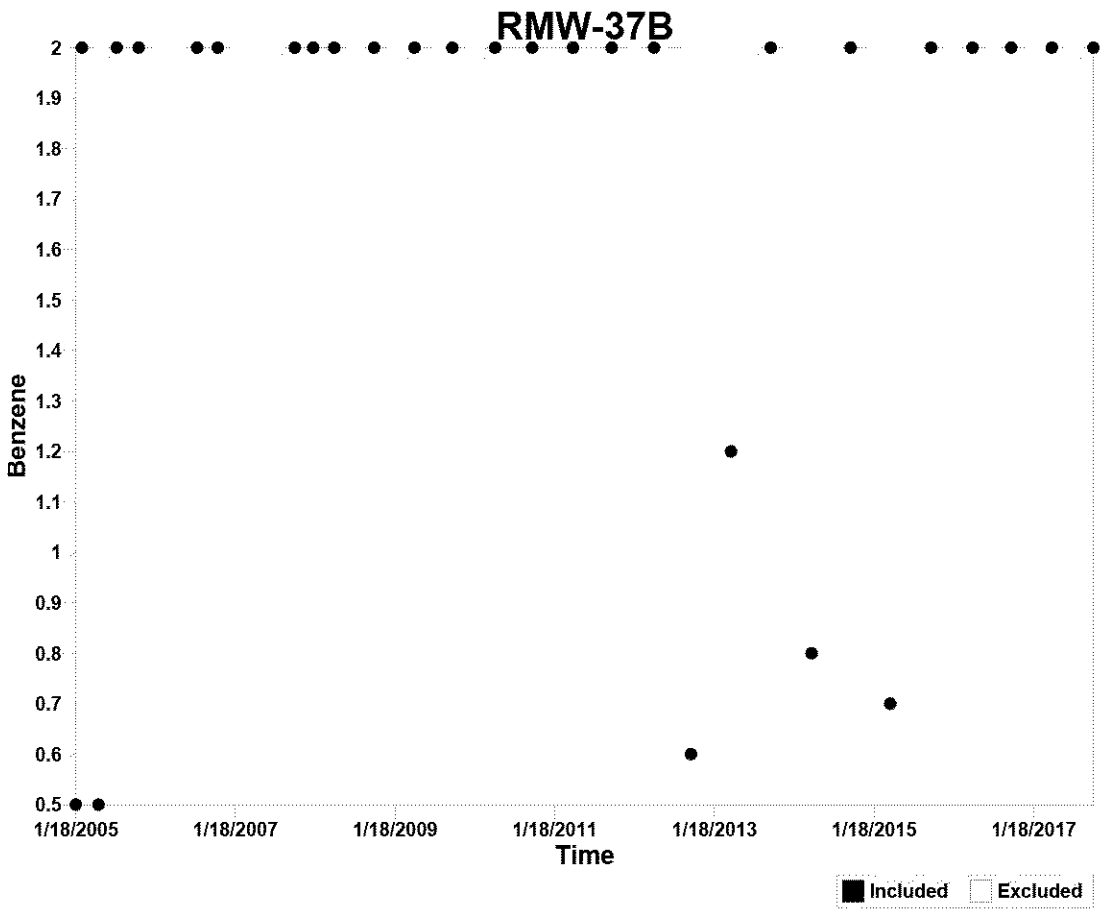
RMW-36F							
Time	Value		Time	Value		Time	Value
9/16/2005	2		10/9/2008	2		4/10/2014	2
10/20/2005	2		4/8/2009	2		10/2/2014	2
2/6/2006	2		10/8/2009	2		4/8/2015	2
4/17/2006	2		4/13/2010	2		10/6/2015	2
7/27/2006	2		10/6/2010	2		4/11/2016	2
10/31/2006	2		10/4/2011	2		10/5/2016	2
10/10/2007	2		10/2/2012	2		4/10/2017	2
1/11/2008	2		4/2/2013	2		10/18/2017	2
4/17/2008	2		10/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



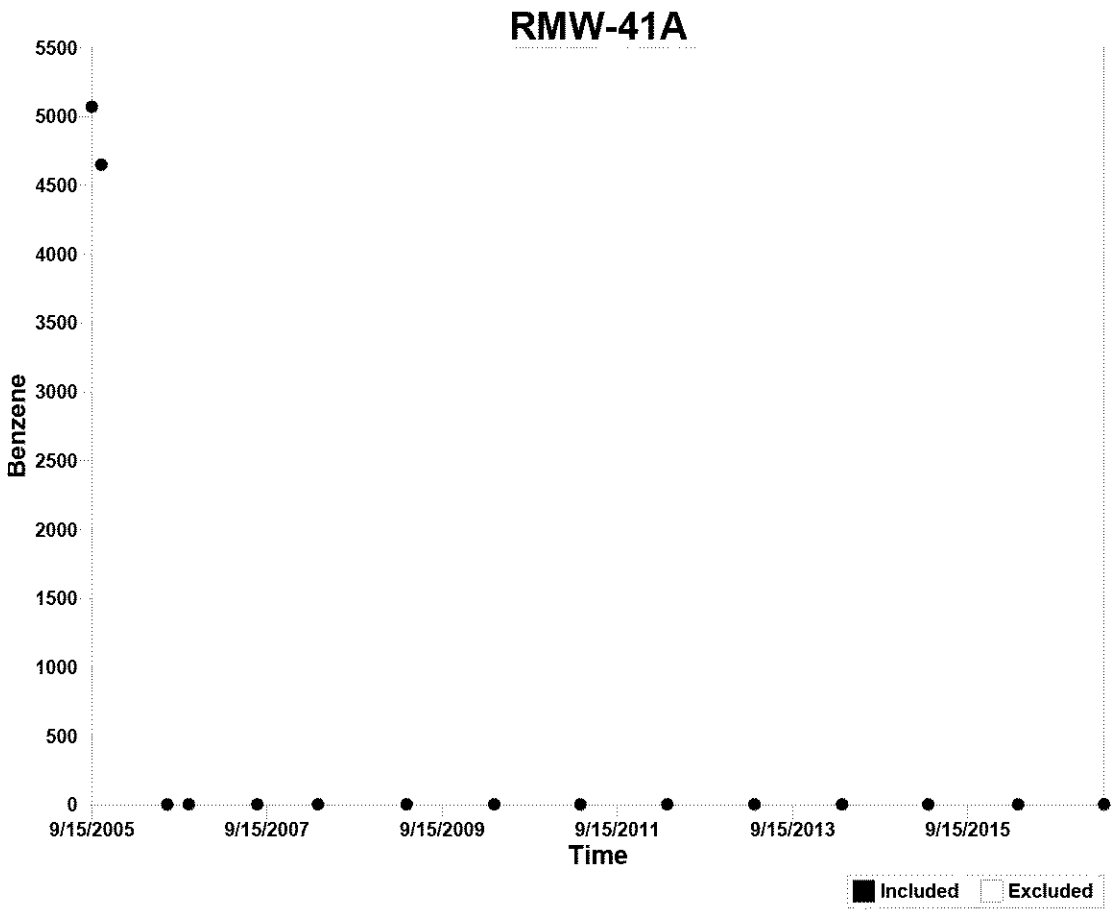
RMW-37A							
Time	Value		Time	Value		Time	Value
1/18/2005	1.7		10/7/2009	2		10/2/2013	2
2/16/2005	2		4/14/2010	2		10/3/2014	2
5/2/2005	2		10/7/2010	2		4/9/2015	2
7/25/2005	2		4/7/2011	2		10/7/2015	2
1/17/2007	2		10/5/2011	2		4/11/2016	2
4/9/2008	2		4/9/2012	2		10/7/2016	0.9
10/14/2008	2		10/3/2012	2		4/11/2017	2
4/17/2009	2		4/4/2013	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



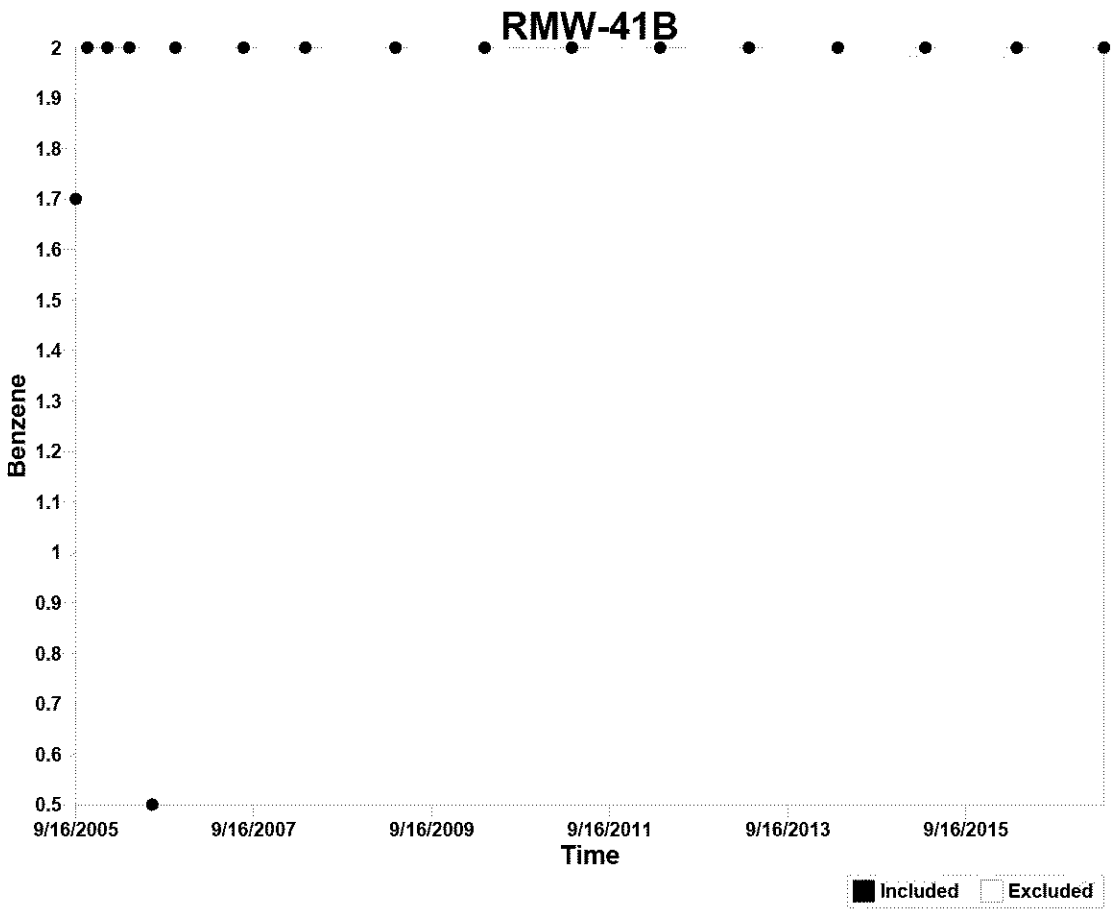
RMW-37B							
Time	Value		Time	Value		Time	Value
1/18/2005	0.5		10/14/2008	2		10/3/2013	2
2/15/2005	2		4/17/2009	2		4/8/2014	0.8
5/2/2005	0.5		10/7/2009	2		10/3/2014	2
7/25/2005	2		4/21/2010	2		4/3/2015	0.7
11/2/2005	2		10/7/2010	2		10/7/2015	2
7/27/2006	2		4/12/2011	2		4/13/2016	2
10/30/2006	2		10/6/2011	2		10/7/2016	2
10/17/2007	2		4/17/2012	2		4/11/2017	2
1/9/2008	2		10/3/2012	0.6		10/18/2017	2
4/15/2008	2		4/4/2013	1.2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



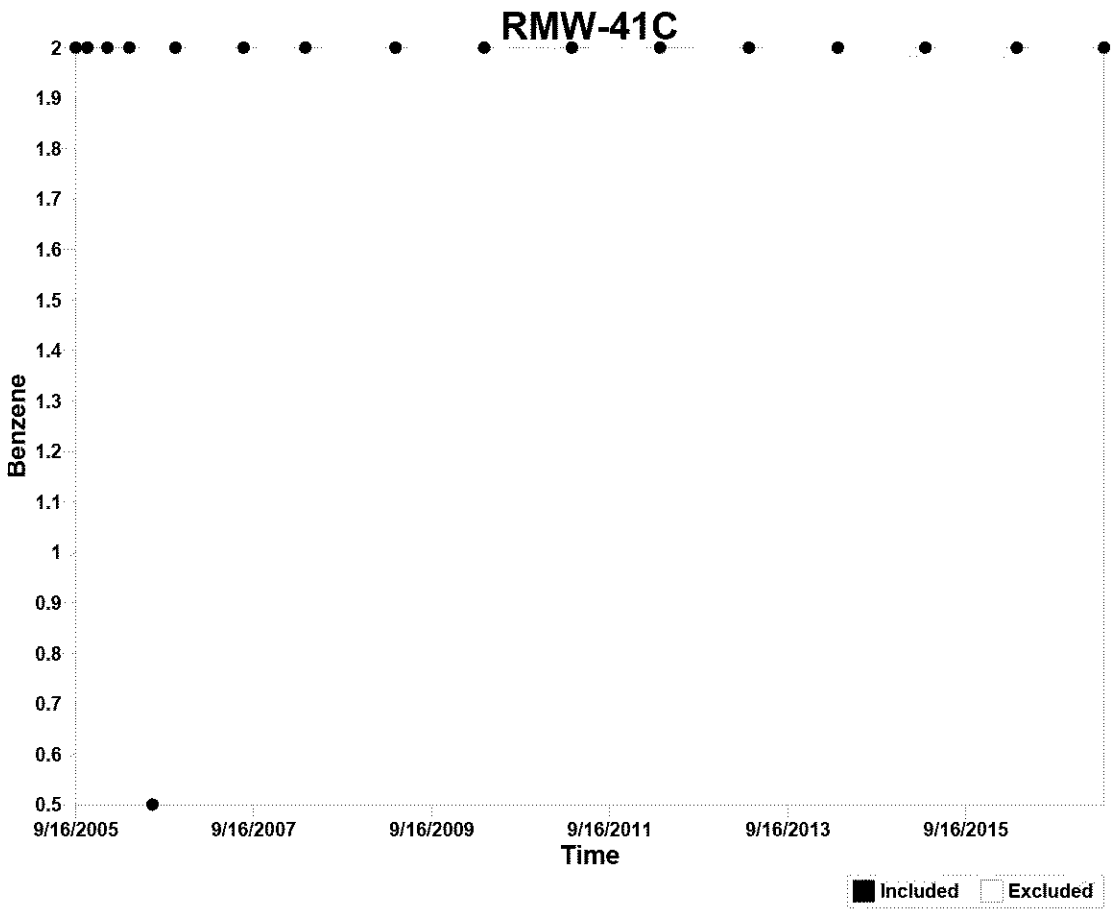
RMW-41A							
Time	Value		Time	Value		Time	Value
9/15/2005	5070		4/15/2008	2		4/9/2013	2
10/25/2005	4650		4/20/2009	2		4/9/2014	2
7/27/2006	0.7		4/20/2010	2		4/3/2015	2
10/25/2006	2		4/14/2011	2		4/12/2016	2
8/6/2007	2		4/10/2012	2		4/5/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



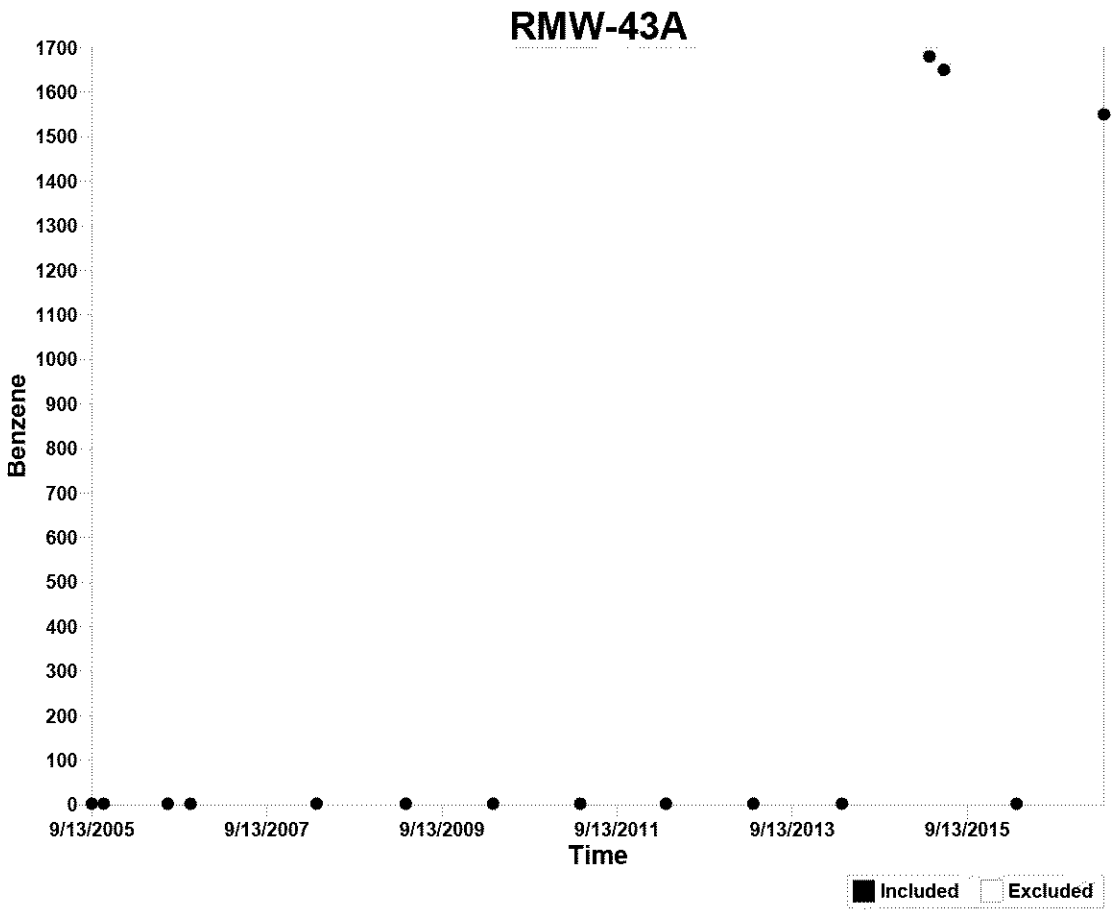
RMW-41B								
Time	Value		Time	Value		Time	Value
9/16/2005	1.7		8/6/2007	2		4/9/2013	2
11/3/2005	2		4/15/2008	2		4/9/2014	2
1/24/2006	2		4/20/2009	2		4/3/2015	2
4/24/2006	2		4/21/2010	2		4/12/2016	2
7/27/2006	0.5		4/14/2011	2		4/5/2017	2
10/30/2006	2		4/10/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



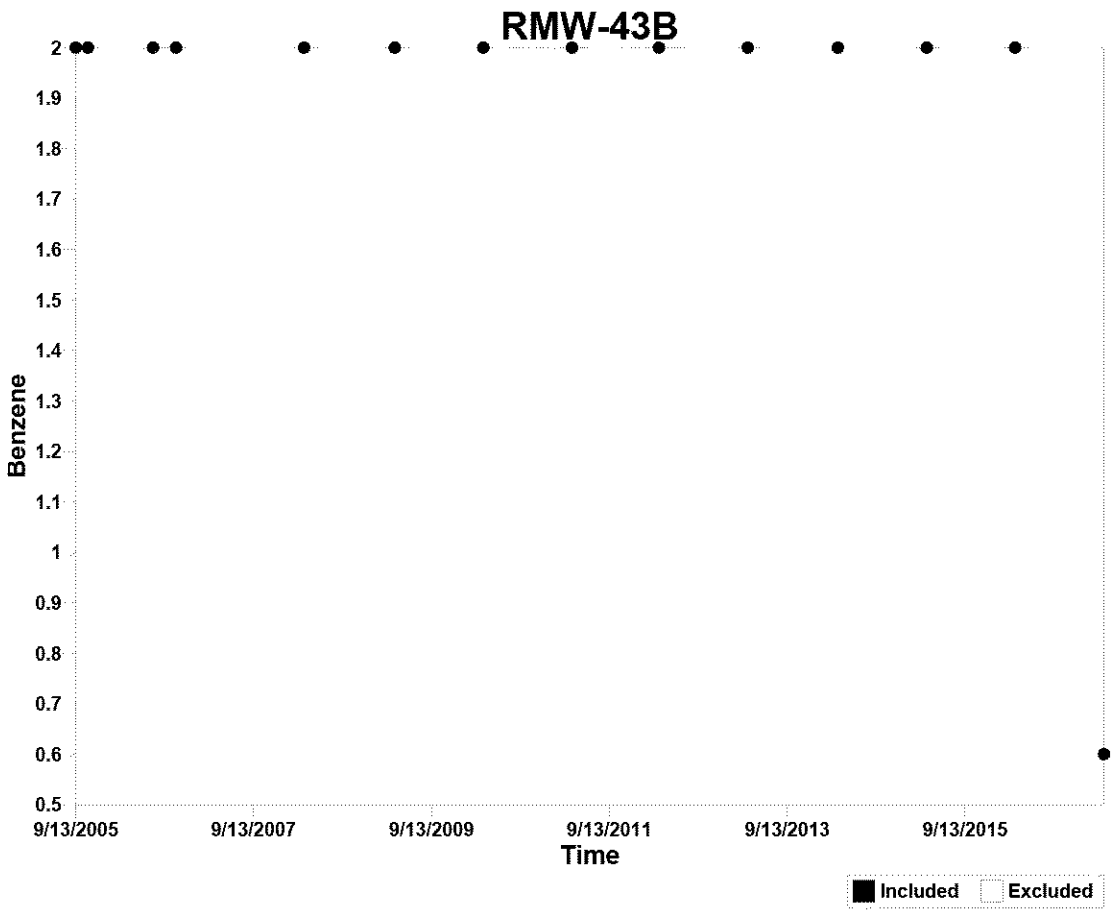
RMW-41C							
Time	Value		Time	Value		Time	Value
9/16/2005	2		8/6/2007	2		4/9/2013	2
11/3/2005	2		4/15/2008	2		4/9/2014	2
1/24/2006	2		4/20/2009	2		4/3/2015	2
4/24/2006	2		4/19/2010	2		4/12/2016	2
7/28/2006	0.5		4/14/2011	2		4/5/2017	2
10/30/2006	2		4/10/2012	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



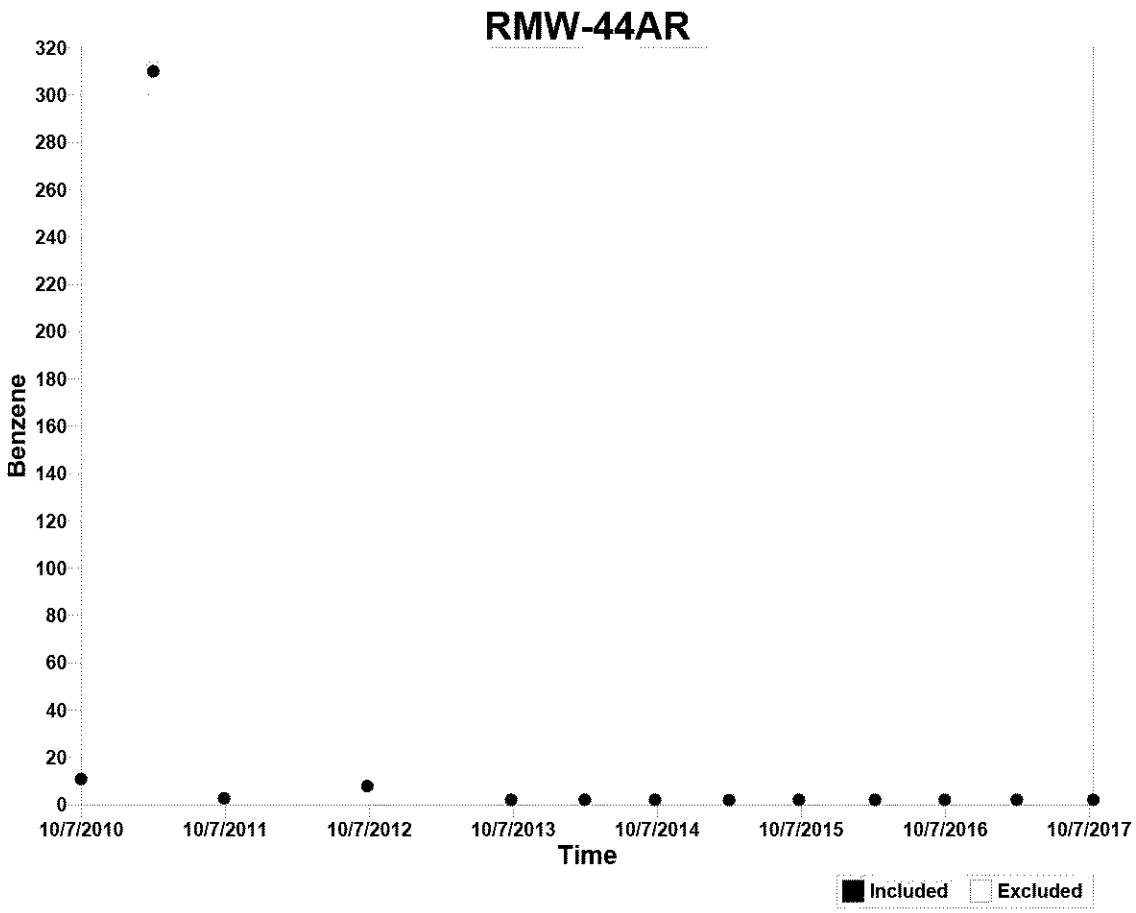
RMW-43A							
Time	Value		Time	Value		Time	Value
9/13/2005	2		4/15/2009	2		4/9/2014	2
11/2/2005	2		4/14/2010	2		4/9/2015	1680
7/27/2006	2		4/13/2011	2		6/8/2015	1650
10/30/2006	2		4/4/2012	2		4/6/2016	2
4/8/2008	2		4/4/2013	2		4/6/2017	1550

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



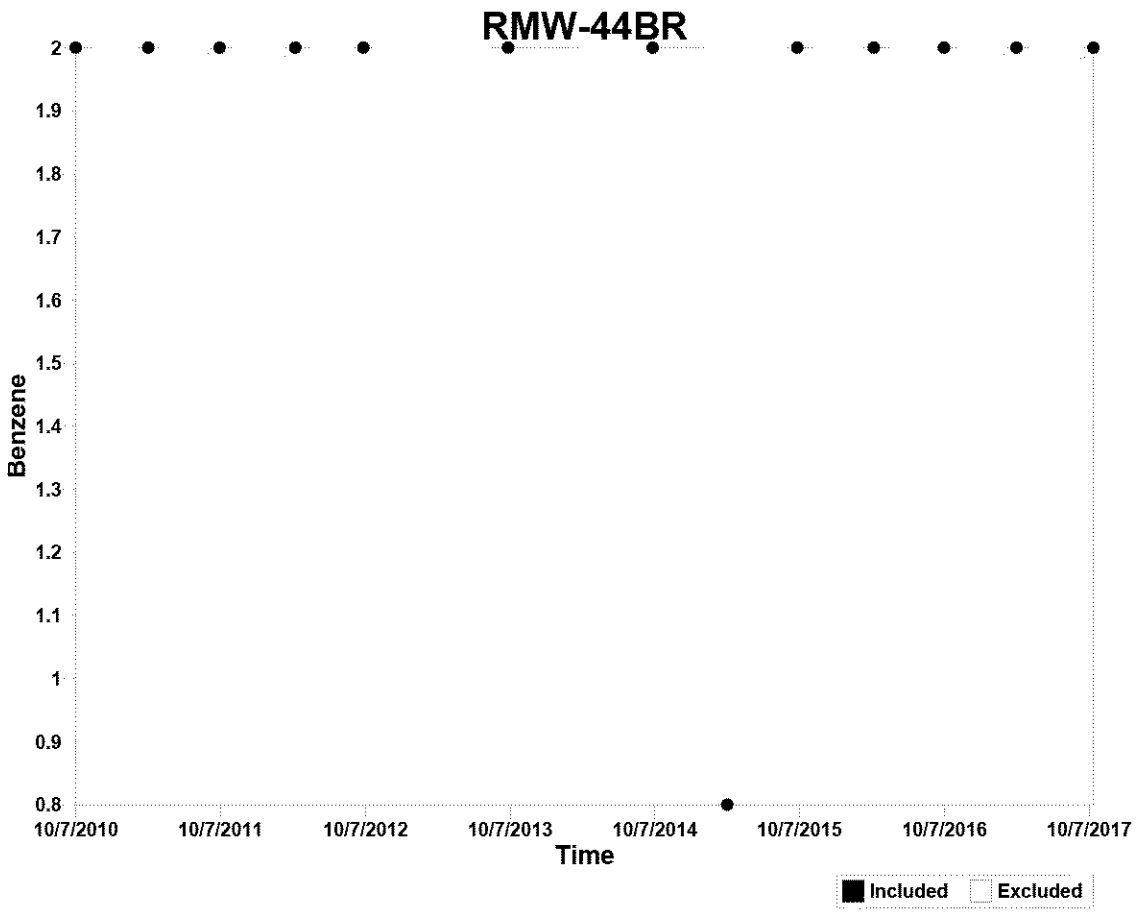
RMW-43B							
Time	Value		Time	Value		Time	Value
9/13/2005	2		4/15/2009	2		4/9/2014	2
11/2/2005	2		4/14/2010	2		4/9/2015	2
7/28/2006	2		4/13/2011	2		4/6/2016	2
10/30/2006	2		4/4/2012	2		4/6/2017	0.6
4/8/2008	2		4/4/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



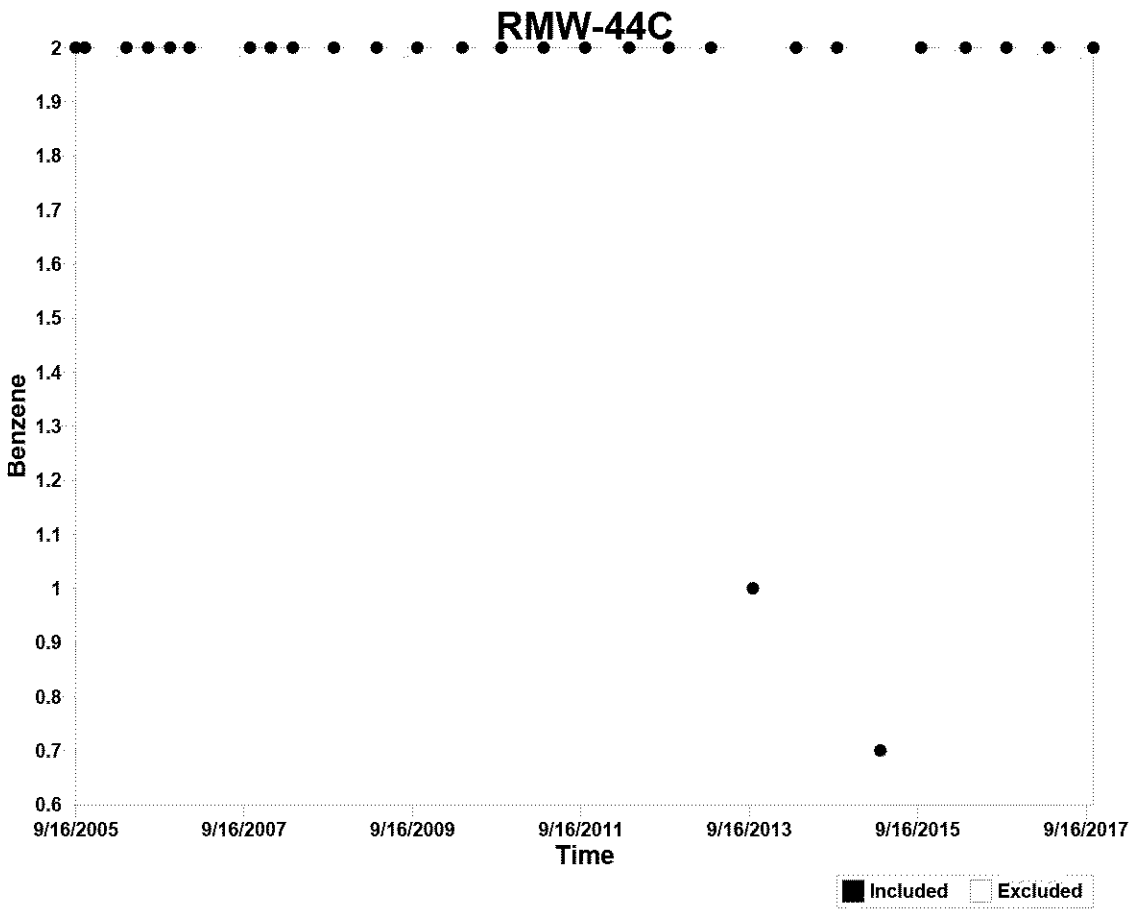
RMW-44AR							
Time	Value		Time	Value		Time	Value
10/7/2010	10.8		4/7/2014	2		10/6/2016	2
4/8/2011	310		10/2/2014	2		4/7/2017	2
10/5/2011	2.6		4/8/2015	1.9		10/18/2017	2
10/2/2012	7.8		10/2/2015	2			
10/2/2013	2		4/12/2016	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



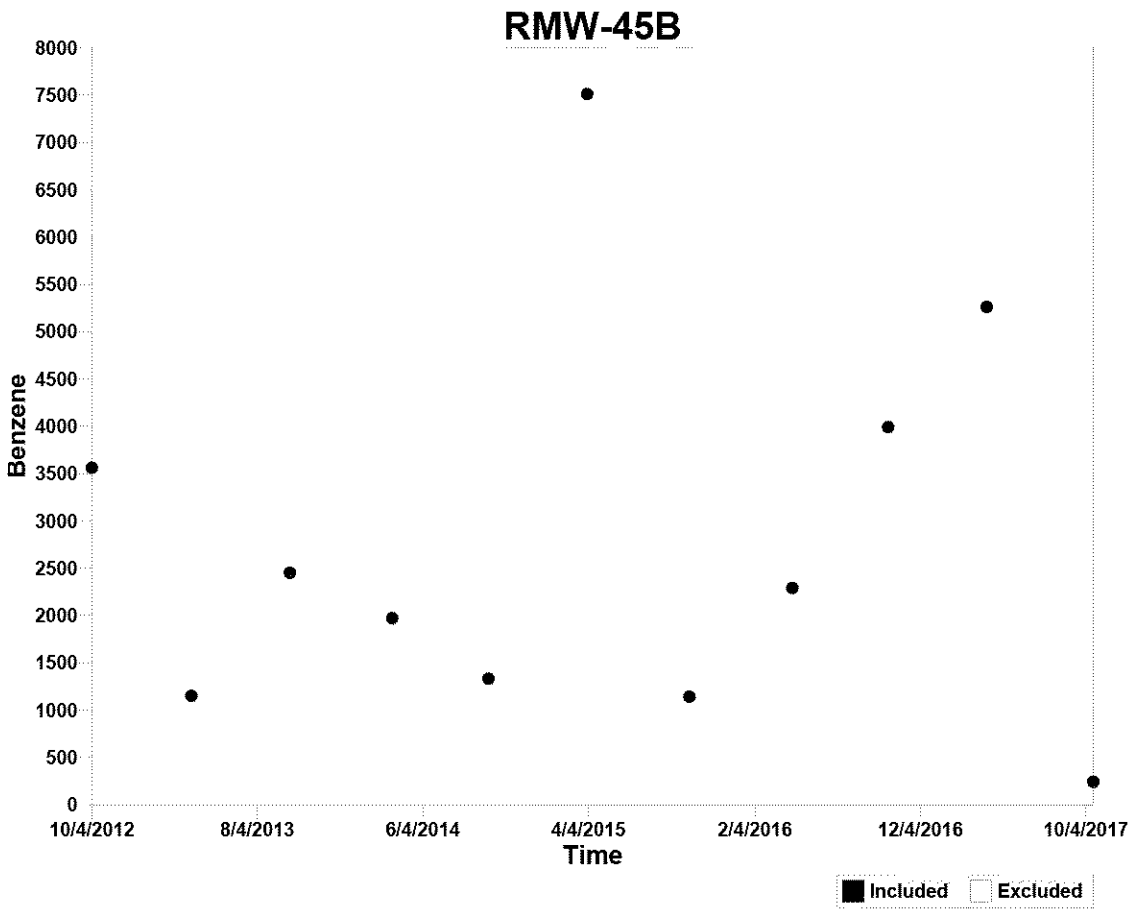
RMW-44BR							
Time	Value		Time	Value		Time	Value
10/7/2010	2		10/2/2013	2		10/6/2016	2
4/8/2011	2		10/2/2014	2		4/7/2017	2
10/5/2011	2		4/8/2015	0.8		10/18/2017	2
4/13/2012	2		10/2/2015	2			
10/2/2012	2		4/12/2016	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



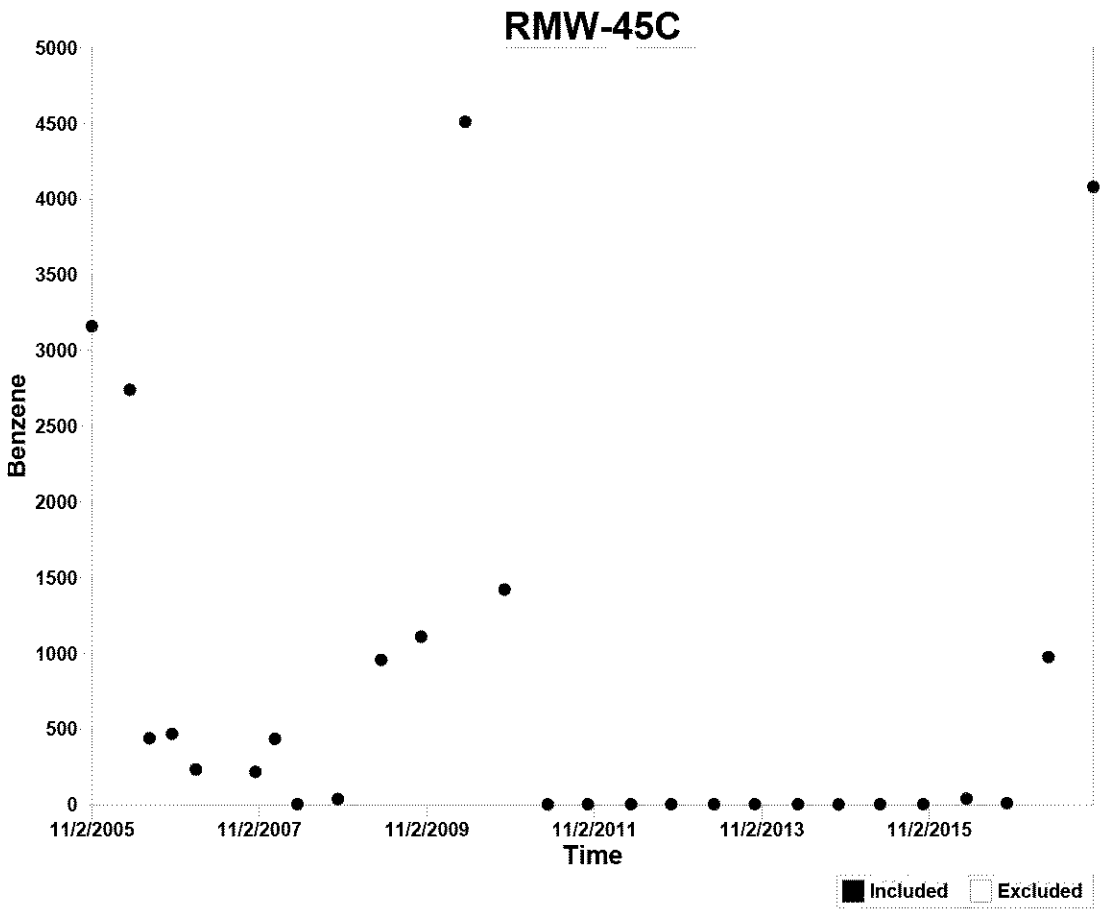
RMW-44C							
Time	Value		Time	Value		Time	Value
9/16/2005	2		4/14/2009	2		4/7/2014	2
10/26/2005	2		10/7/2009	2		10/2/2014	2
4/24/2006	2		4/20/2010	2		4/8/2015	0.7
7/27/2006	2		10/7/2010	2		10/2/2015	2
10/30/2006	2		4/8/2011	2		4/12/2016	2
1/23/2007	2		10/5/2011	2		10/6/2016	2
10/12/2007	2		4/13/2012	2		4/7/2017	2
1/10/2008	2		10/2/2012	2		10/18/2017	2
4/15/2008	2		4/3/2013	2			
10/10/2008	2		10/2/2013	1			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



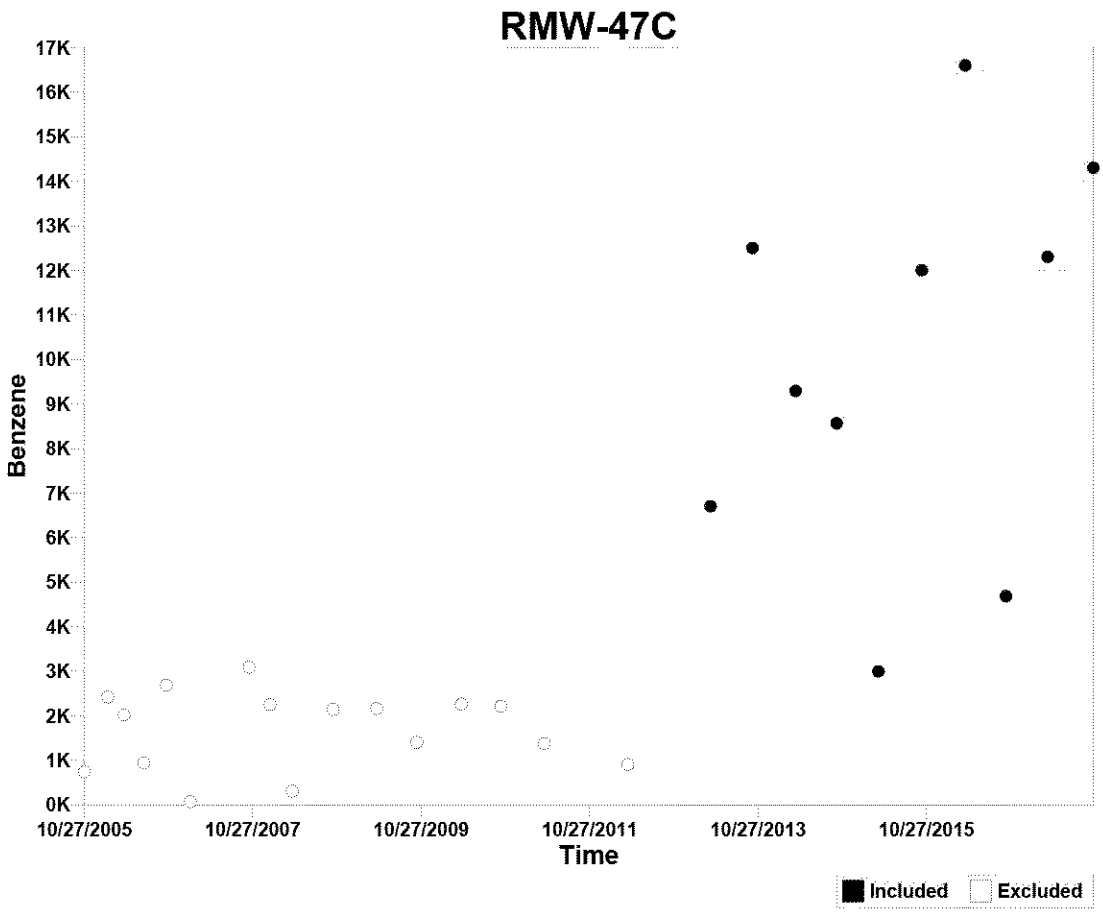
RMW-45B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
10/4/2012	3560		10/3/2014	1330		10/6/2016	3990
4/5/2013	1150		4/2/2015	7510		4/5/2017	5260
10/3/2013	2450		10/7/2015	1140		10/18/2017	240
4/9/2014	1970		4/13/2016	2290			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



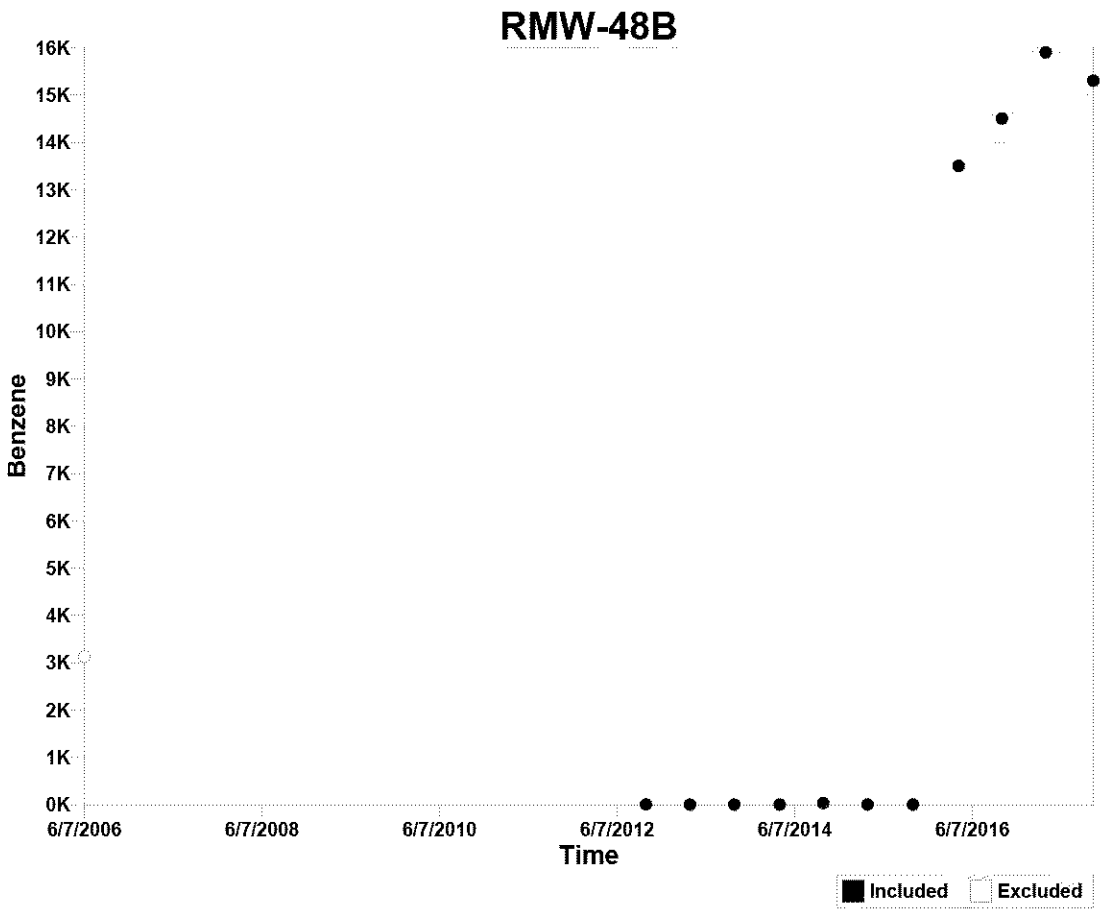
RMW-45C							
Time	Value		Time	Value		Time	Value
11/2/2005	3160		4/17/2009	956		10/3/2013	2
4/17/2006	2740		10/8/2009	1110		4/9/2014	2
7/12/2006	438		4/19/2010	4510		10/3/2014	0.9
10/18/2006	467		10/7/2010	1420		4/2/2015	2
1/30/2007	232		4/14/2011	1.3		10/7/2015	2
10/17/2007	216		10/6/2011	2		4/13/2016	38.5
1/10/2008	434		4/11/2012	2		10/6/2016	9.9
4/17/2008	2		10/3/2012	2		4/5/2017	975
10/10/2008	36.6		4/8/2013	2		10/18/2017	4080

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



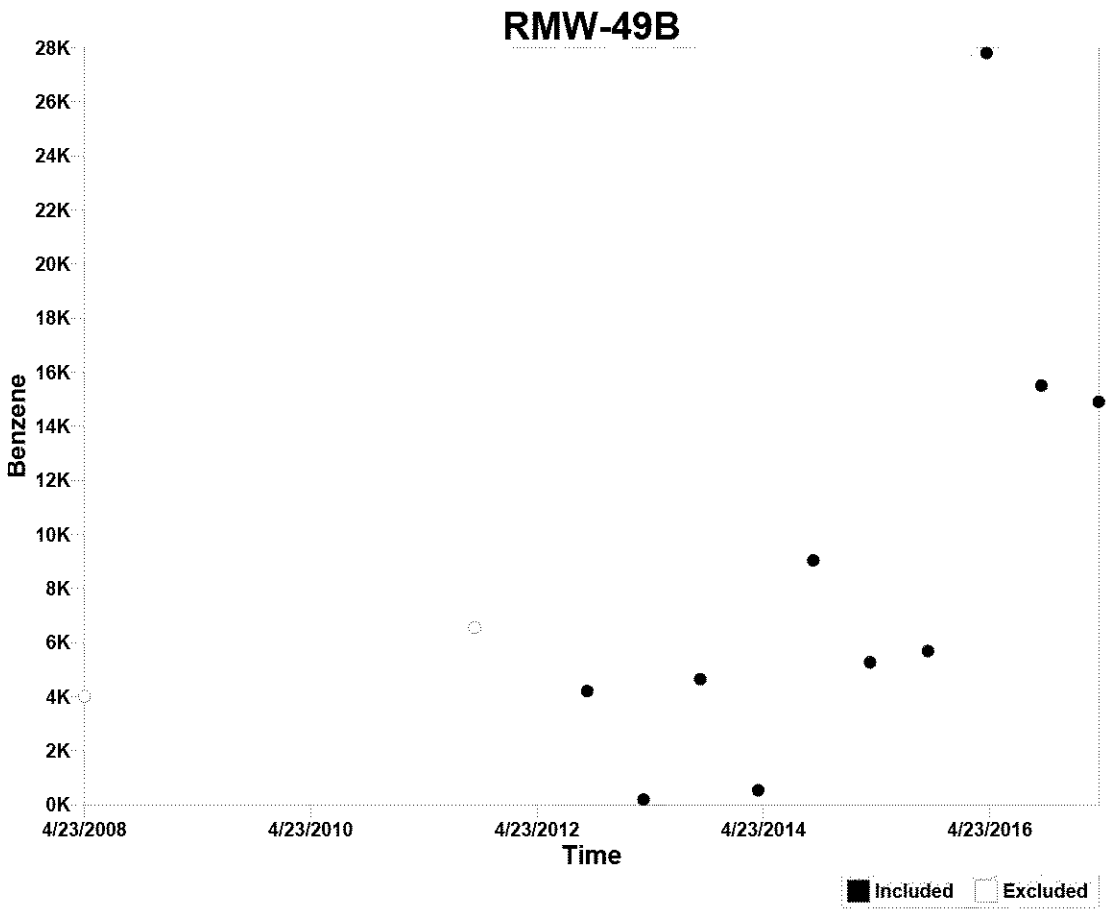
RMW-47C							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
10/27/2005	*739*		10/10/2008	*2140*		4/8/2014	9290
2/6/2006	*2420*		4/17/2009	*2160*		10/3/2014	8560
4/17/2006	*2020*		10/8/2009	*1400*		4/2/2015	2990
7/12/2006	*939*		4/19/2010	*2260*		10/7/2015	12000
10/18/2006	*2690*		10/7/2010	*2210*		4/12/2016	16600
1/30/2007	*71*		4/14/2011	*1370*		10/6/2016	4680
10/12/2007	*3090*		4/10/2012	*902*		4/5/2017	12300
1/10/2008	*2250*		4/4/2013	6700		10/20/2017	14300
4/16/2008	*303*		10/3/2013	12500			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



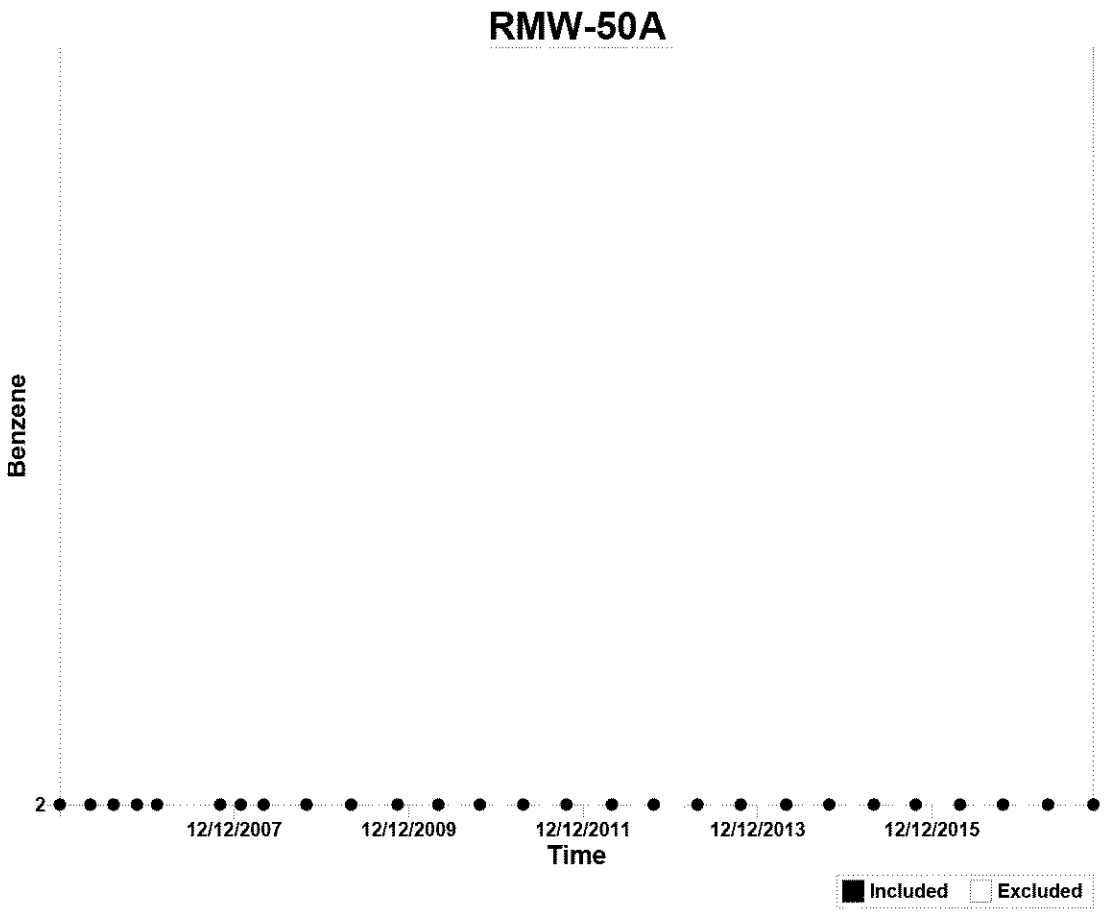
RMW-48B							
Time	Value		Time	Value		Time	Value
6/7/2006	*3130*		4/7/2014	0.6		4/12/2016	13500
10/4/2012	3.4		10/3/2014	31.1		10/7/2016	14500
4/3/2013	0.6		4/3/2015	2		4/5/2017	15900
10/2/2013	1.3		10/7/2015	0.8		10/18/2017	15300

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-49B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
4/23/2008	*4010*		10/2/2013	4640		10/7/2015	5680
10/5/2011	*6550*		4/7/2014	530		4/13/2016	27800
10/2/2012	4200		10/2/2014	9030		10/7/2016	15500
4/2/2013	183		4/3/2015	5260		4/10/2017	14900

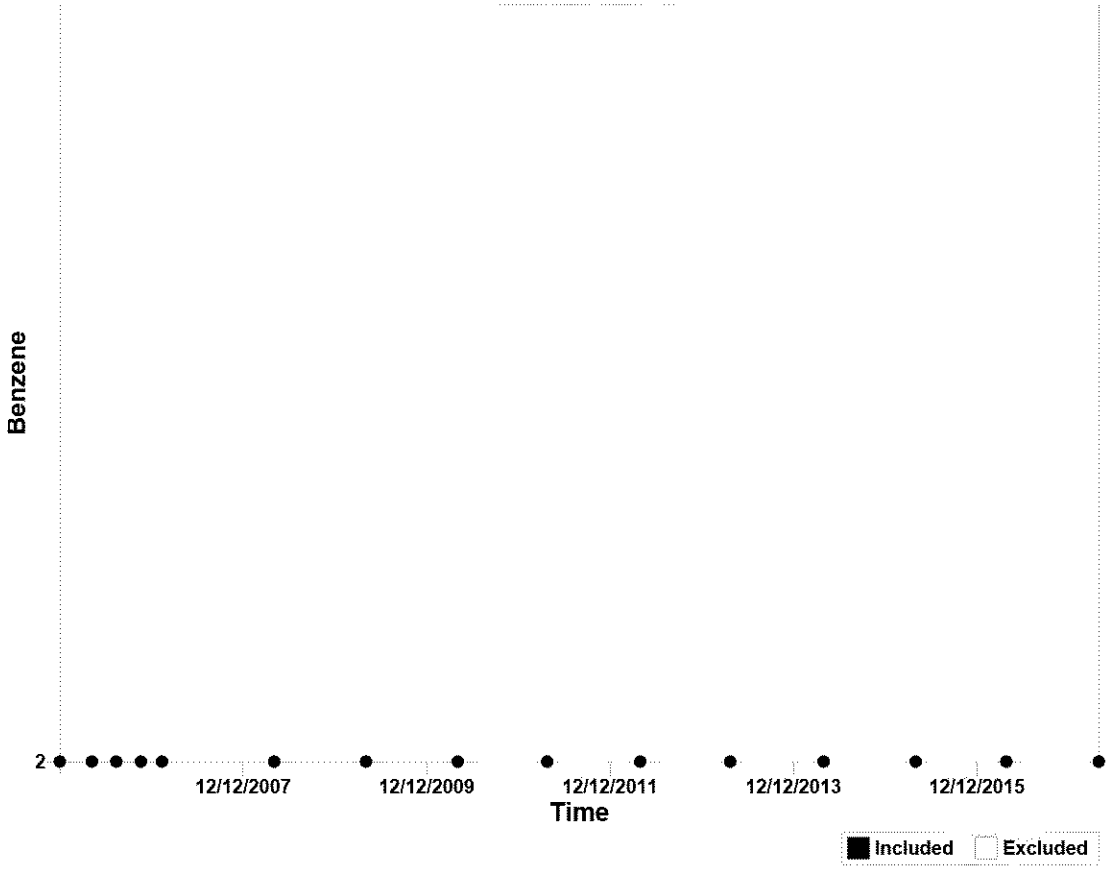
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-50A							
Time	Value		Time	Value		Time	Value
12/12/2005	2		4/15/2009	2		10/2/2013	2
4/19/2006	2		10/27/2009	2		4/11/2014	2
7/25/2006	2		4/15/2010	2		10/8/2014	2
10/31/2006	2		10/6/2010	2		4/13/2015	2
1/23/2007	2		4/6/2011	2		10/5/2015	2
10/15/2007	2		10/4/2011	2		4/8/2016	2
1/9/2008	2		4/11/2012	2		10/5/2016	2
4/14/2008	2		10/3/2012	2		4/11/2017	2
10/10/2008	2		4/4/2013	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

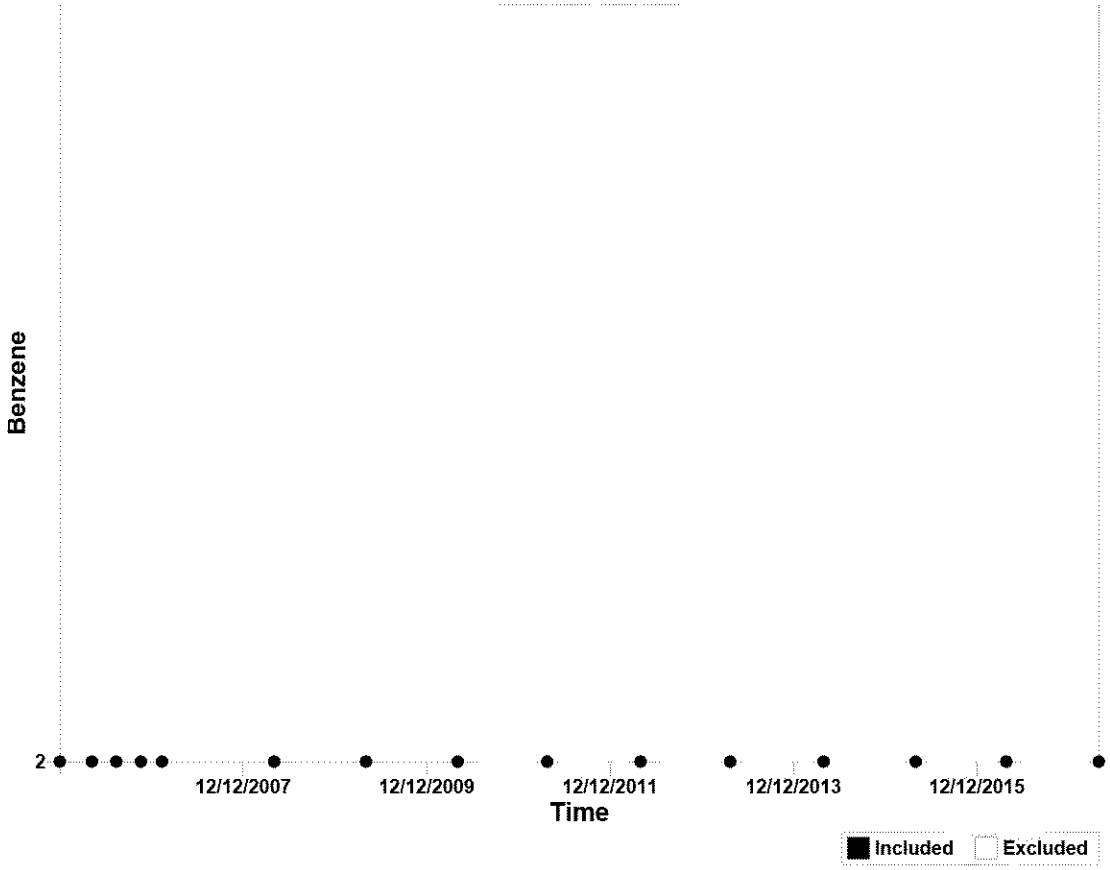
RMW-50B



RMW-50B							
Time	Value		Time	Value		Time	Value
12/12/2005	2		4/14/2008	2		4/4/2013	2
4/19/2006	2		4/15/2009	2		4/11/2014	2
7/25/2006	2		4/15/2010	2		4/13/2015	2
10/31/2006	2		4/6/2011	2		4/8/2016	2
1/23/2007	2		4/11/2012	2		4/11/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

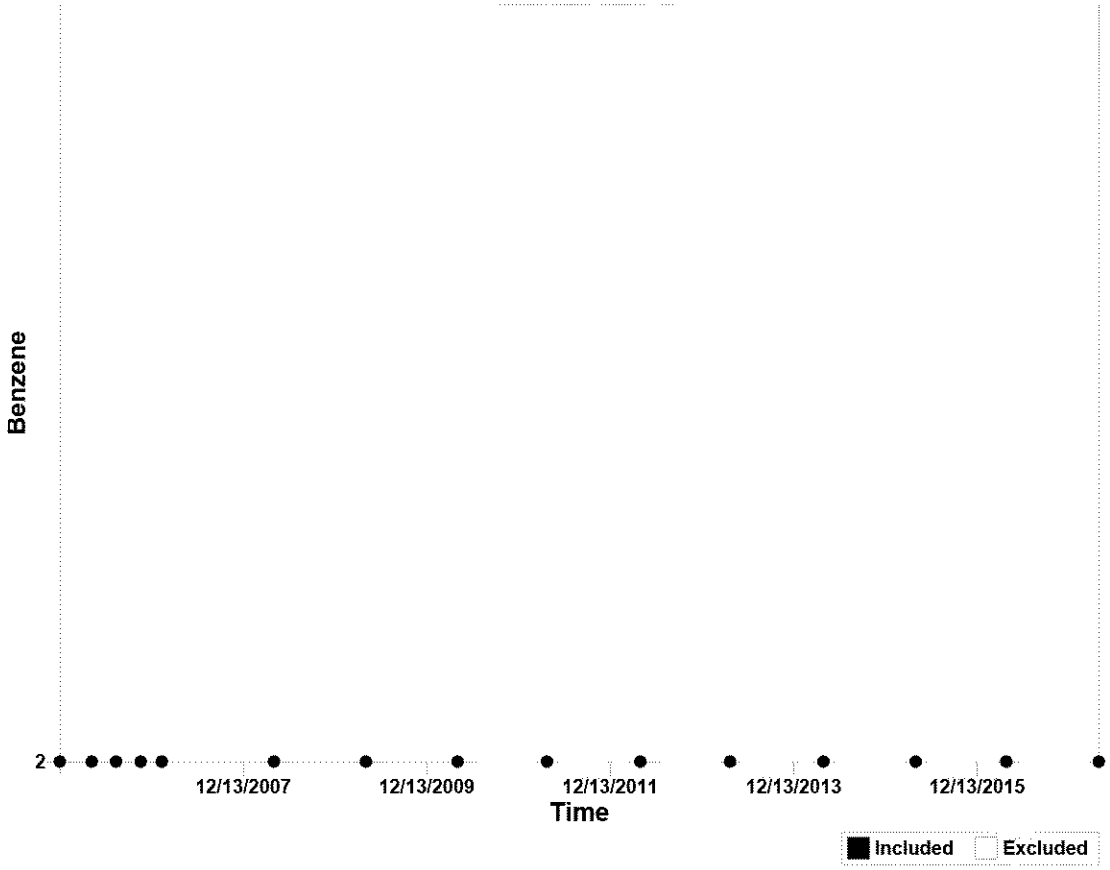
RMW-50C



RMW-50C							
Time	Value		Time	Value		Time	Value
12/12/2005	2		4/14/2008	2		4/4/2013	2
4/19/2006	2		4/15/2009	2		4/11/2014	2
7/25/2006	2		4/15/2010	2		4/13/2015	2
10/31/2006	2		4/6/2011	2		4/8/2016	2
1/23/2007	2		4/12/2012	2		4/11/2017	2

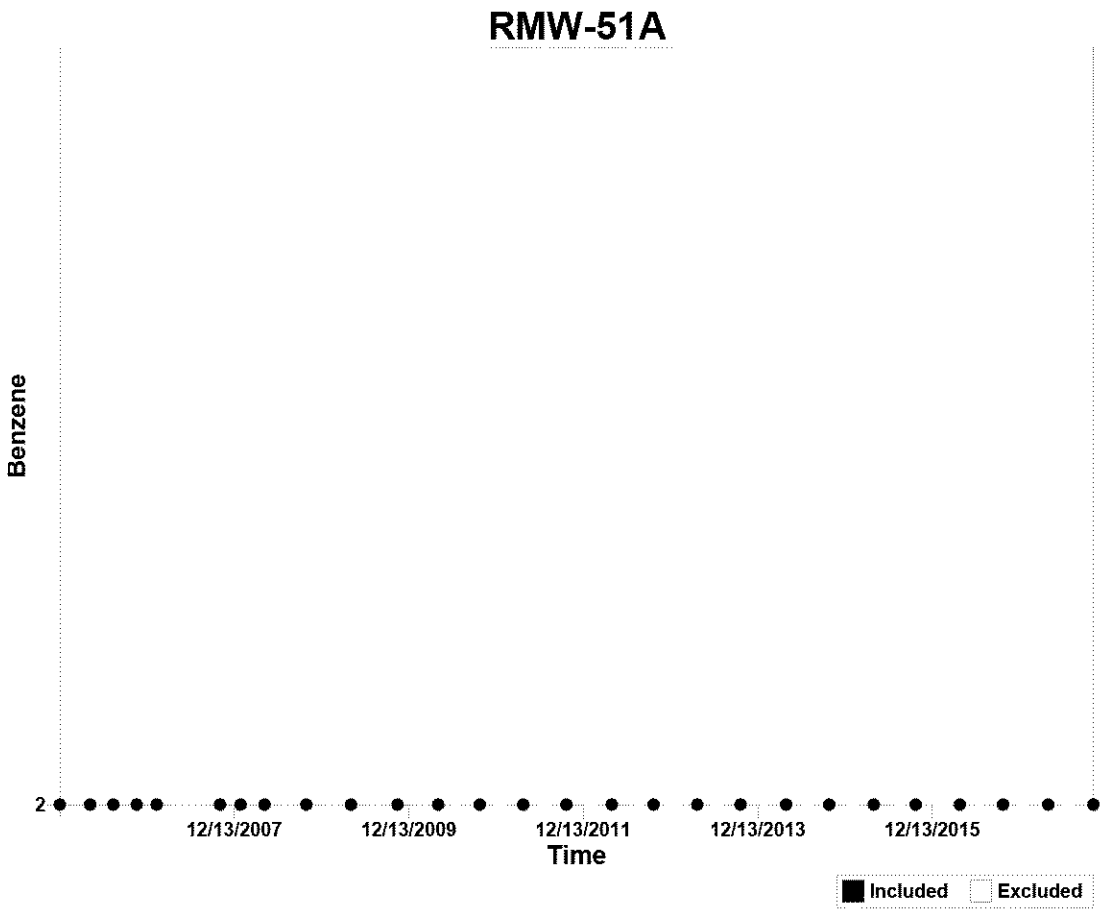
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-50D



RMW-50D							
Time	Value		Time	Value		Time	Value
12/13/2005	2		4/14/2008	2		4/4/2013	2
4/19/2006	2		4/15/2009	2		4/11/2014	2
7/25/2006	2		4/15/2010	2		4/13/2015	2
10/31/2006	2		4/6/2011	2		4/8/2016	2
1/23/2007	2		4/12/2012	2		4/11/2017	2

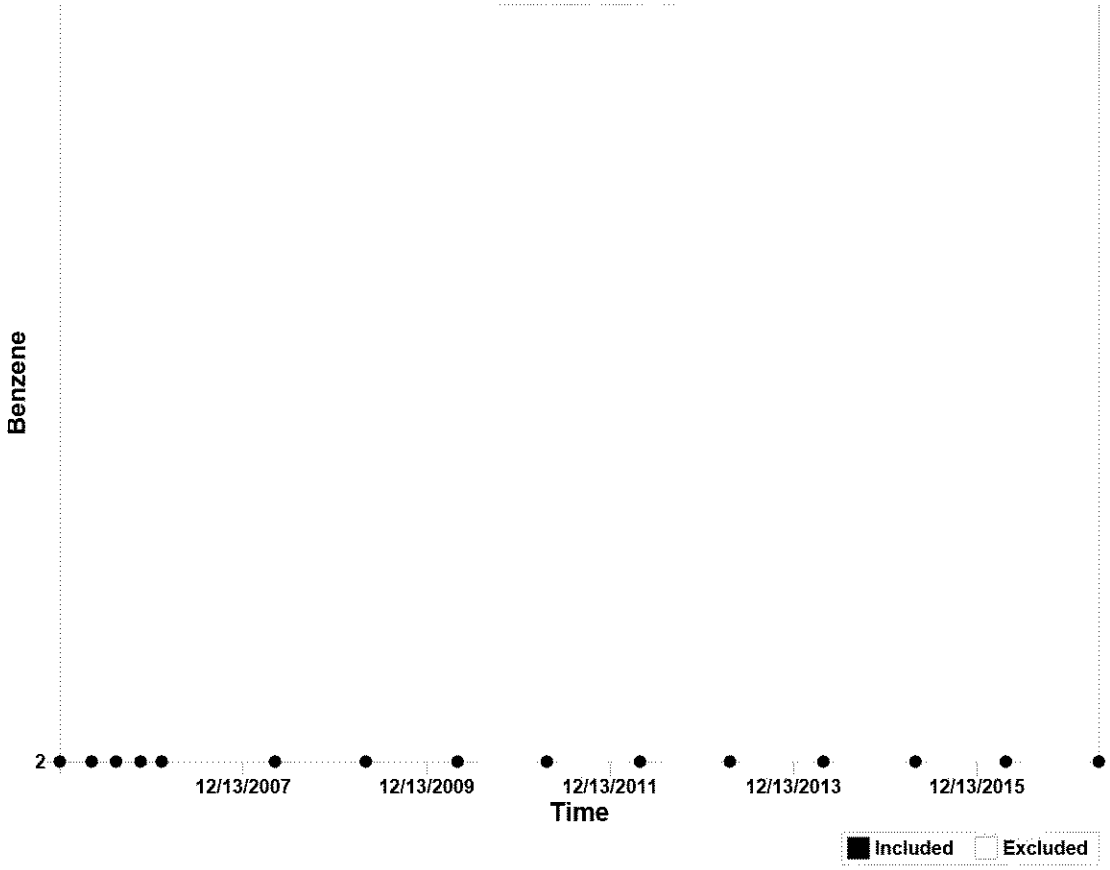
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-51A							
Time	Value		Time	Value		Time	Value
12/13/2005	2		4/15/2009	2		10/2/2013	2
4/19/2006	2		10/27/2009	2		4/11/2014	2
7/25/2006	2		4/15/2010	2		10/8/2014	2
10/31/2006	2		10/6/2010	2		4/13/2015	2
1/23/2007	2		4/6/2011	2		10/5/2015	2
10/15/2007	2		10/4/2011	2		4/7/2016	2
1/9/2008	2		4/11/2012	2		10/5/2016	2
4/18/2008	2		10/3/2012	2		4/12/2017	2
10/10/2008	2		4/4/2013	2		10/18/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

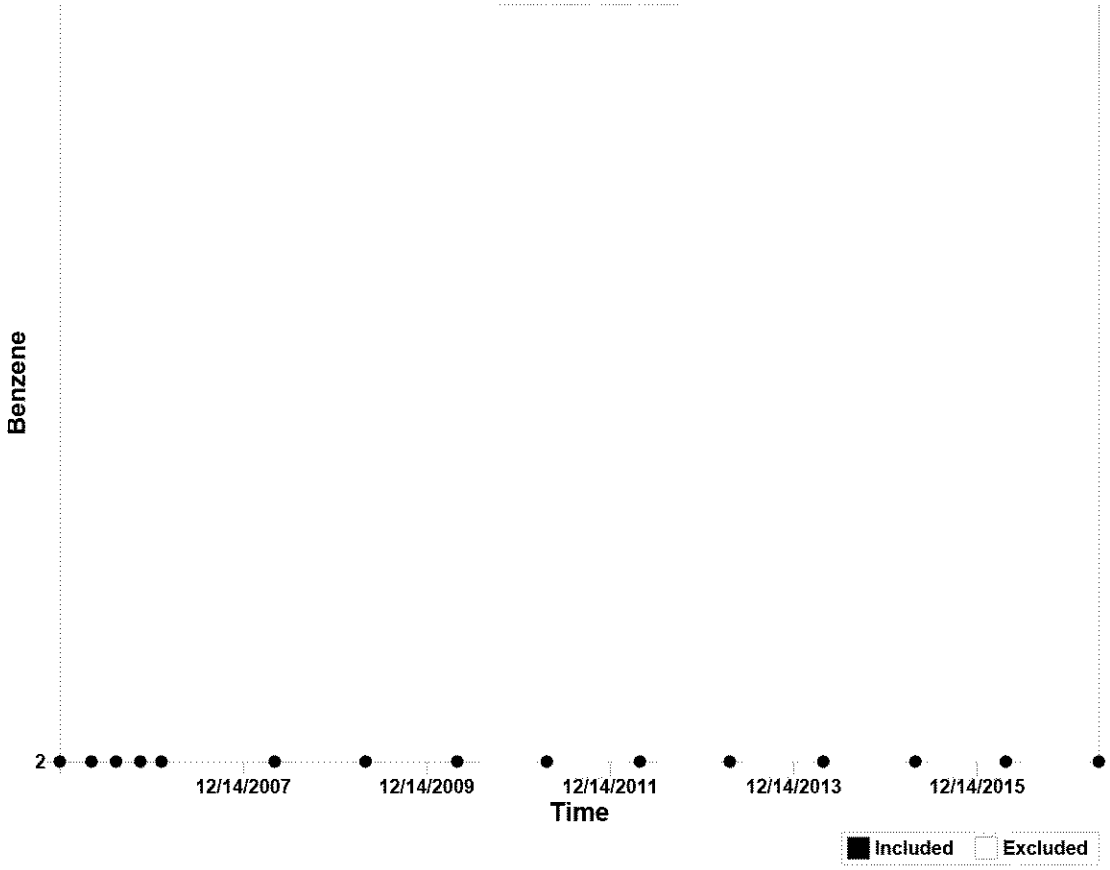
RMW-51B



RMW-51B							
Time	Value		Time	Value		Time	Value
12/13/2005	2		4/18/2008	2		4/4/2013	2
4/19/2006	2		4/15/2009	2		4/11/2014	2
7/25/2006	2		4/15/2010	2		4/13/2015	2
10/31/2006	2		4/6/2011	2		4/7/2016	2
1/23/2007	2		4/11/2012	2		4/12/2017	2

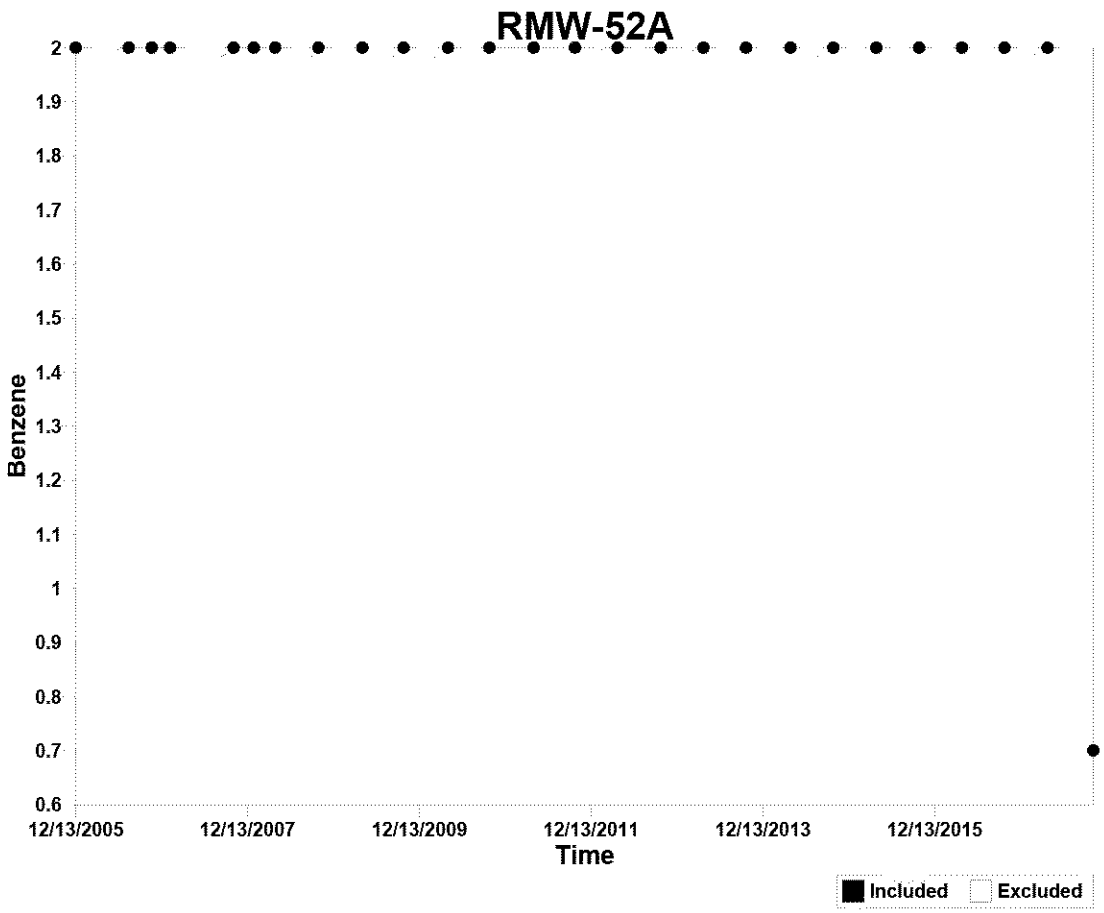
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-51C



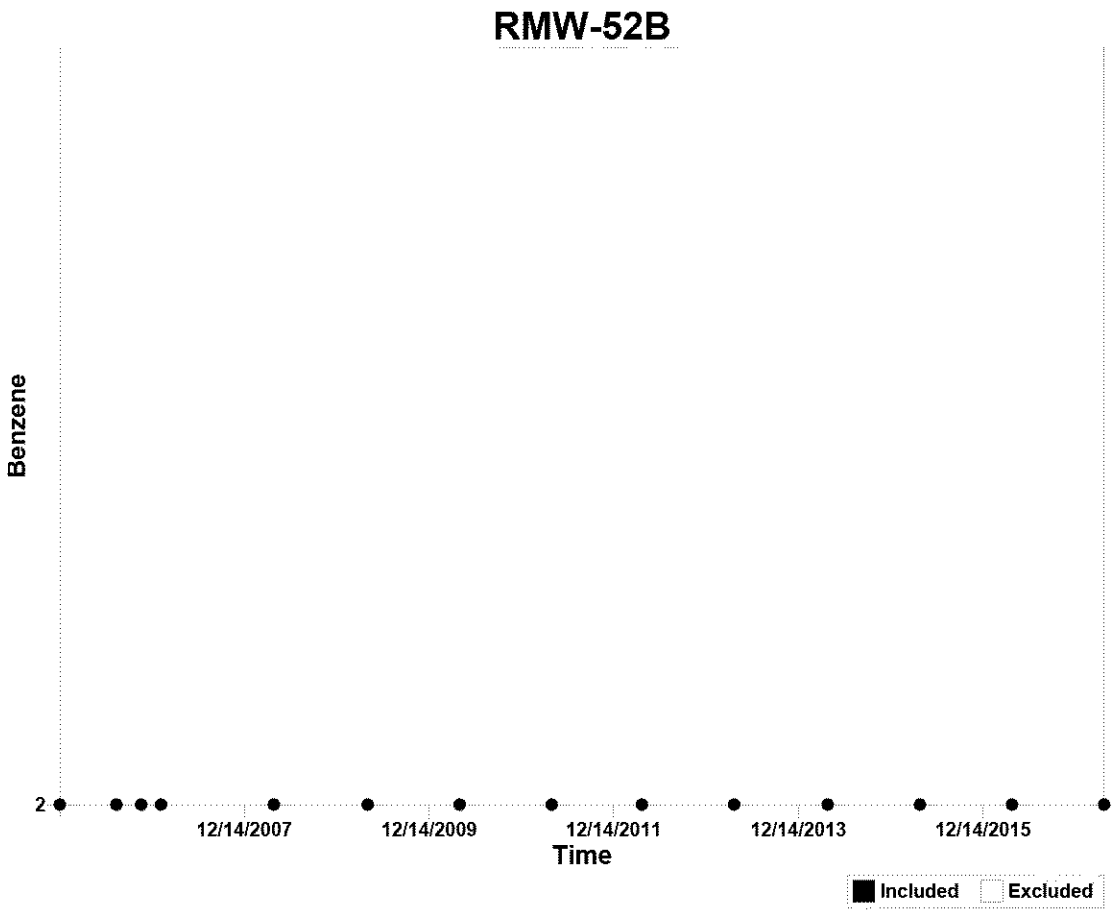
RMW-51C							
Time	Value		Time	Value		Time	Value
12/14/2005	2		4/18/2008	2		4/4/2013	2
4/19/2006	2		4/15/2009	2		4/11/2014	2
7/26/2006	2		4/15/2010	2		4/13/2015	2
10/31/2006	2		4/6/2011	2		4/7/2016	2
1/23/2007	2		4/11/2012	2		4/12/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



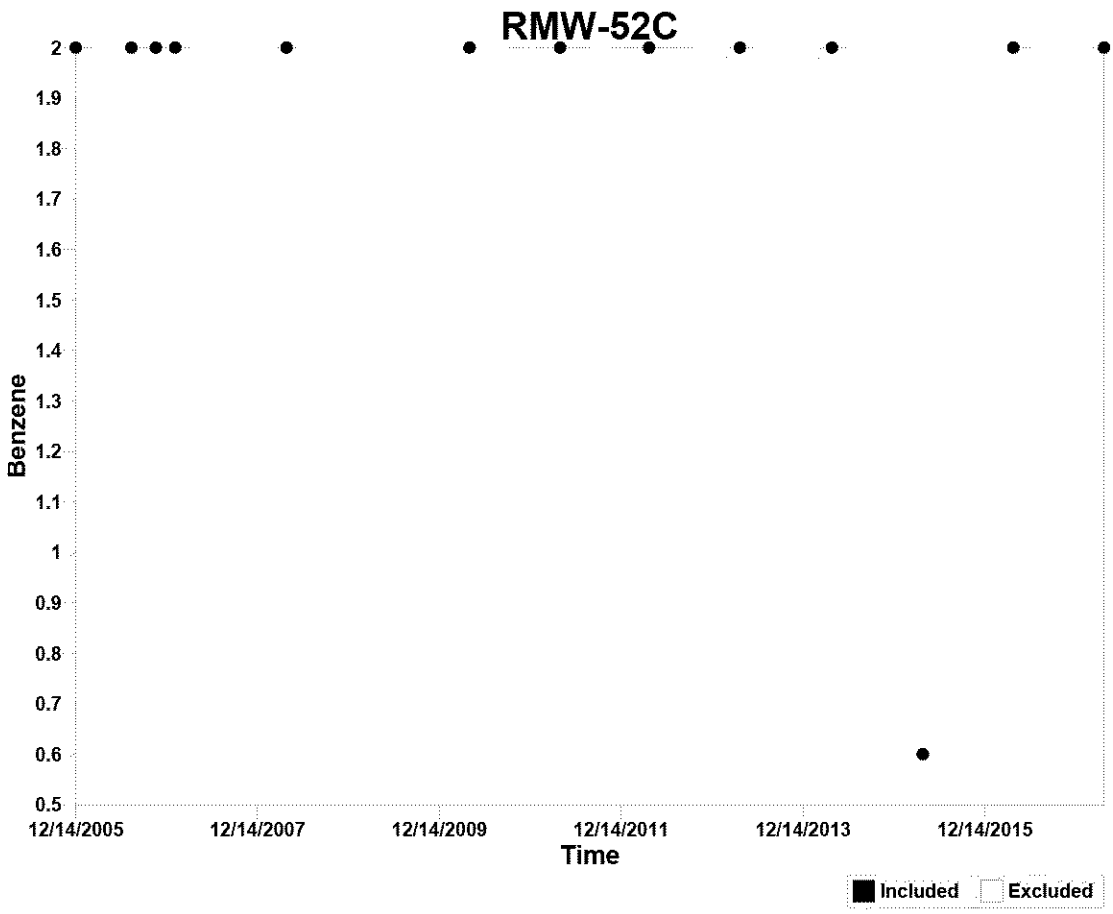
RMW-52A							
Time	Value		Time	Value		Time	Value
12/13/2005	2		10/7/2009	2		4/9/2014	2
7/26/2006	2		4/14/2010	2		10/8/2014	2
11/1/2006	2		10/7/2010	2		4/9/2015	2
1/18/2007	2		4/13/2011	2		10/8/2015	2
10/15/2007	2		10/6/2011	2		4/7/2016	2
1/9/2008	2		4/4/2012	2		10/5/2016	2
4/9/2008	2		10/4/2012	2		4/6/2017	2
10/10/2008	2		4/4/2013	2		10/18/2017	0.7
4/15/2009	2		10/2/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-52B							
Time	Value		Time	Value		Time	Value
12/14/2005	2		4/15/2009	2		4/9/2014	2
7/26/2006	2		4/14/2010	2		4/9/2015	2
11/1/2006	2		4/13/2011	2		4/7/2016	2
1/18/2007	2		4/4/2012	2		4/6/2017	2
4/9/2008	2		4/4/2013	2			

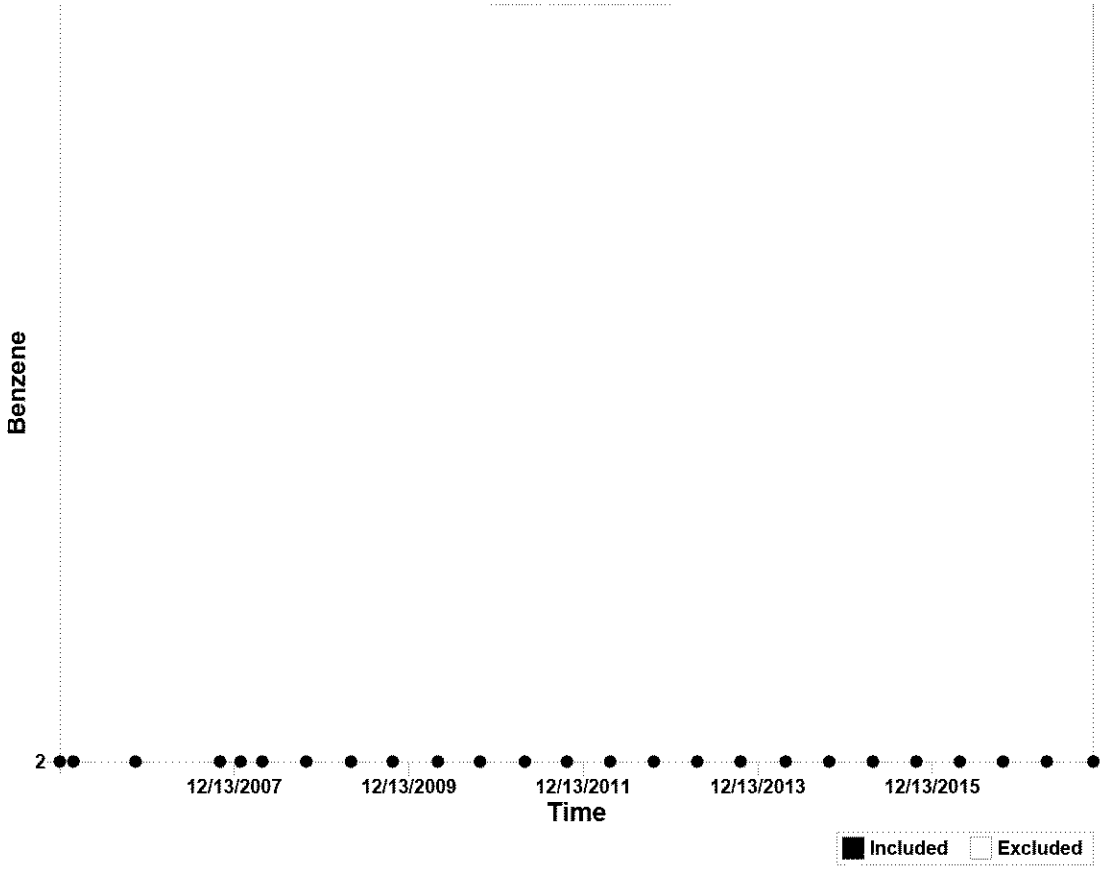
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-52C							
Time	Value		Time	Value		Time	Value
12/14/2005	2		4/14/2010	2		4/9/2015	0.6
7/26/2006	2		4/13/2011	2		4/7/2016	2
11/1/2006	2		4/4/2012	2		4/6/2017	2
1/18/2007	2		4/4/2013	2			
4/9/2008	2		4/9/2014	2			

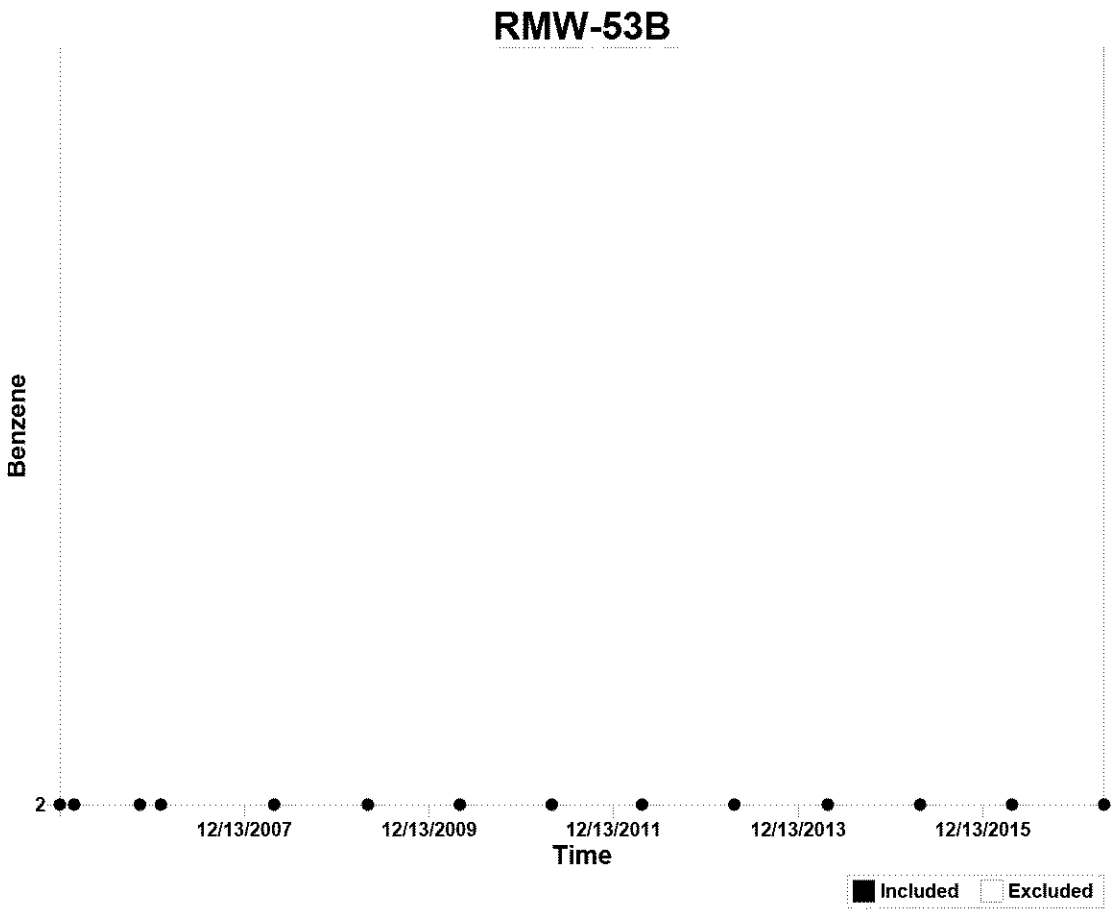
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-53A



RMW-53A							
Time	Value		Time	Value		Time	Value
12/13/2005	2		4/14/2010	2		10/8/2014	2
2/8/2006	2		10/7/2010	2		4/9/2015	2
10/26/2006	2		4/13/2011	2		10/8/2015	2
10/15/2007	2		10/6/2011	2		4/7/2016	2
1/9/2008	2		4/4/2012	2		10/5/2016	2
4/9/2008	2		10/4/2012	2		4/6/2017	2
10/10/2008	2		4/4/2013	2		10/18/2017	2
4/15/2009	2		10/2/2013	2			
10/7/2009	2		4/9/2014	2			

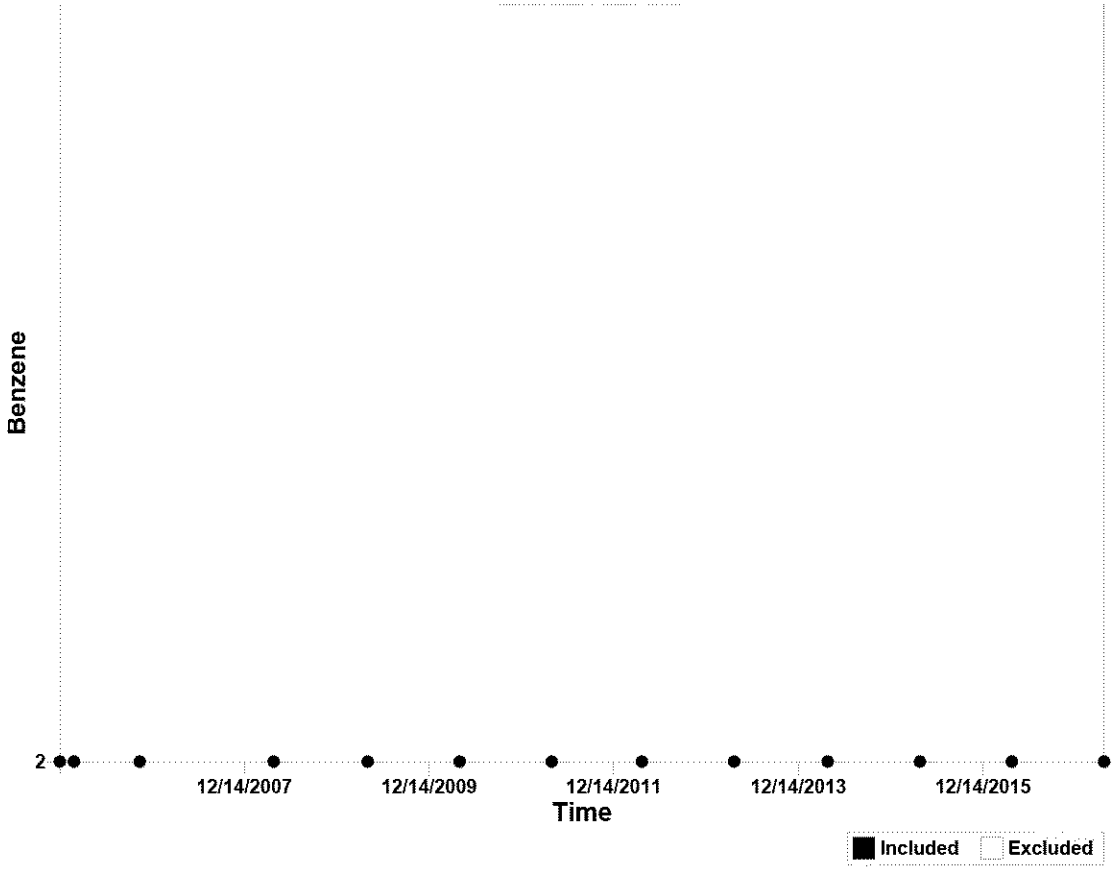
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-53B							
Time	Value		Time	Value		Time	Value
12/13/2005	2		4/15/2009	2		4/9/2014	2
2/8/2006	2		4/14/2010	2		4/9/2015	2
10/26/2006	2		4/13/2011	2		4/7/2016	2
1/17/2007	2		4/4/2012	2		4/6/2017	2
4/9/2008	2		4/4/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

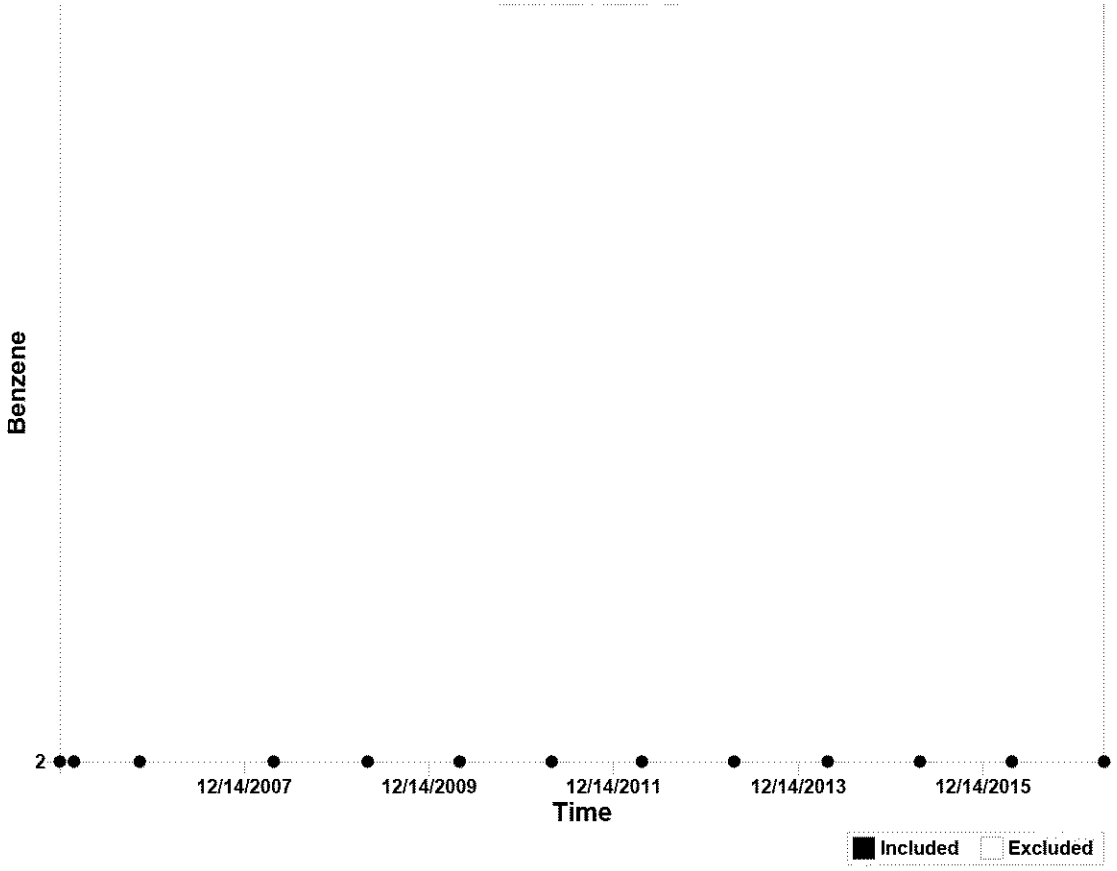
RMW-54A



RMW-54A							
Time	Value		Time	Value		Time	Value
12/14/2005	2		4/14/2010	2		4/9/2015	2
2/8/2006	2		4/13/2011	2		4/6/2016	2
10/26/2006	2		4/4/2012	2		4/6/2017	2
4/8/2008	2		4/4/2013	2			
4/15/2009	2		4/9/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

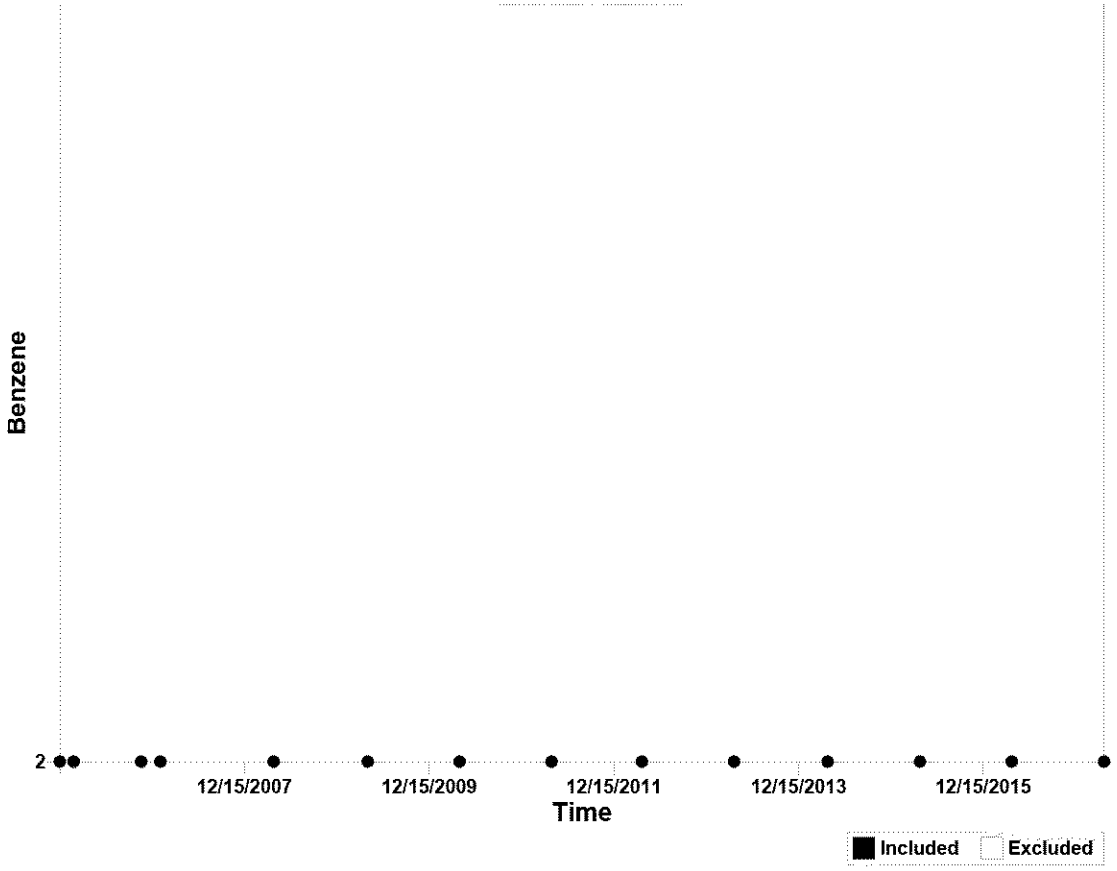
RMW-54B



RMW-54B							
Time	Value		Time	Value		Time	Value
12/14/2005	2		4/14/2010	2		4/9/2015	2
2/8/2006	2		4/13/2011	2		4/6/2016	2
10/26/2006	2		4/4/2012	2		4/6/2017	2
4/8/2008	2		4/4/2013	2			
4/15/2009	2		4/9/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

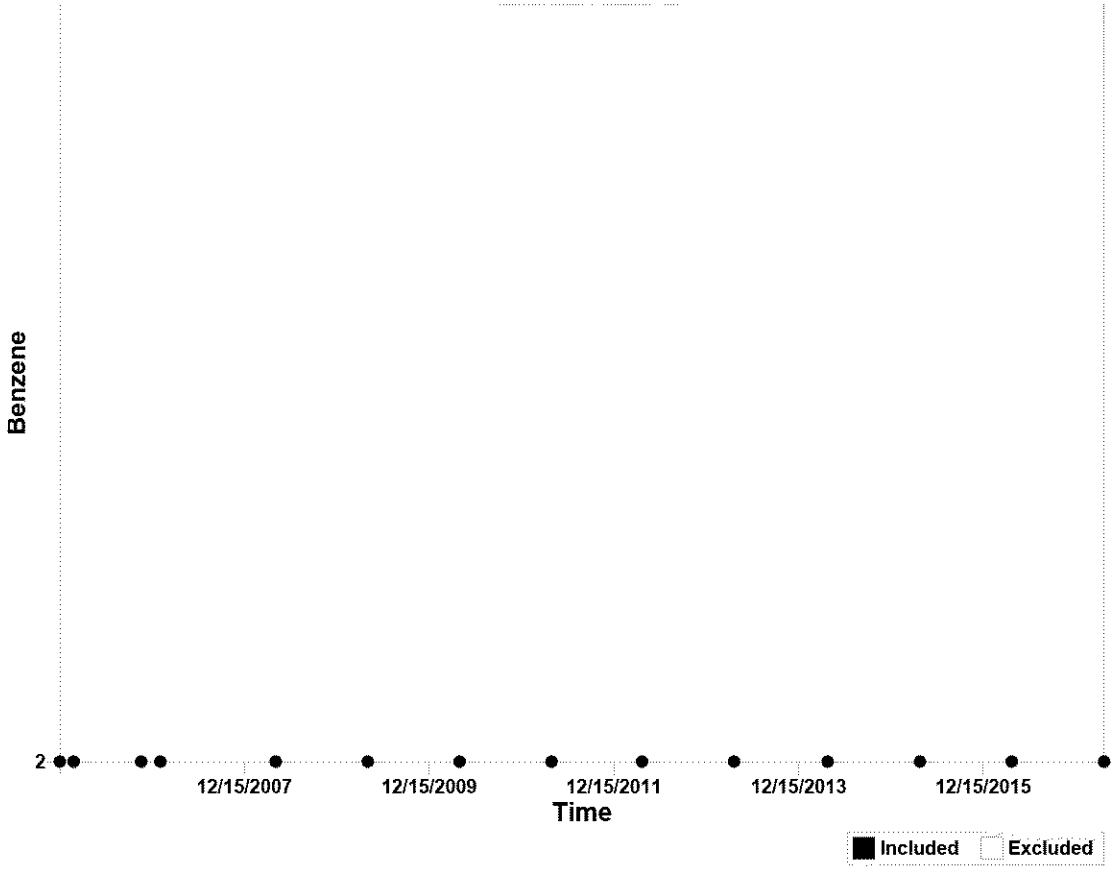
RMW-55A



RMW-55A							
Time	Value		Time	Value		Time	Value
12/15/2005	2		4/16/2009	2		4/9/2014	2
2/8/2006	2		4/14/2010	2		4/9/2015	2
11/2/2006	2		4/13/2011	2		4/6/2016	2
1/17/2007	2		4/4/2012	2		4/6/2017	2
4/9/2008	2		4/4/2013	2			

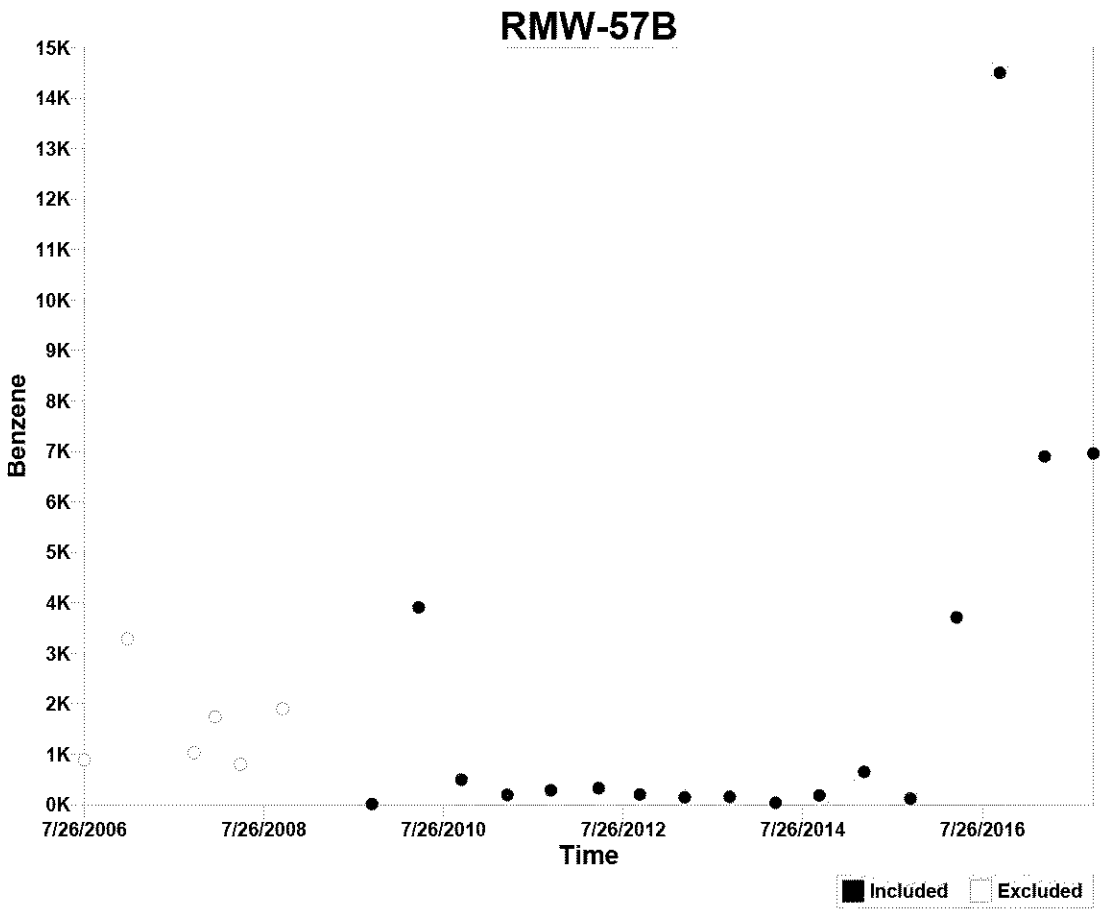
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-55B



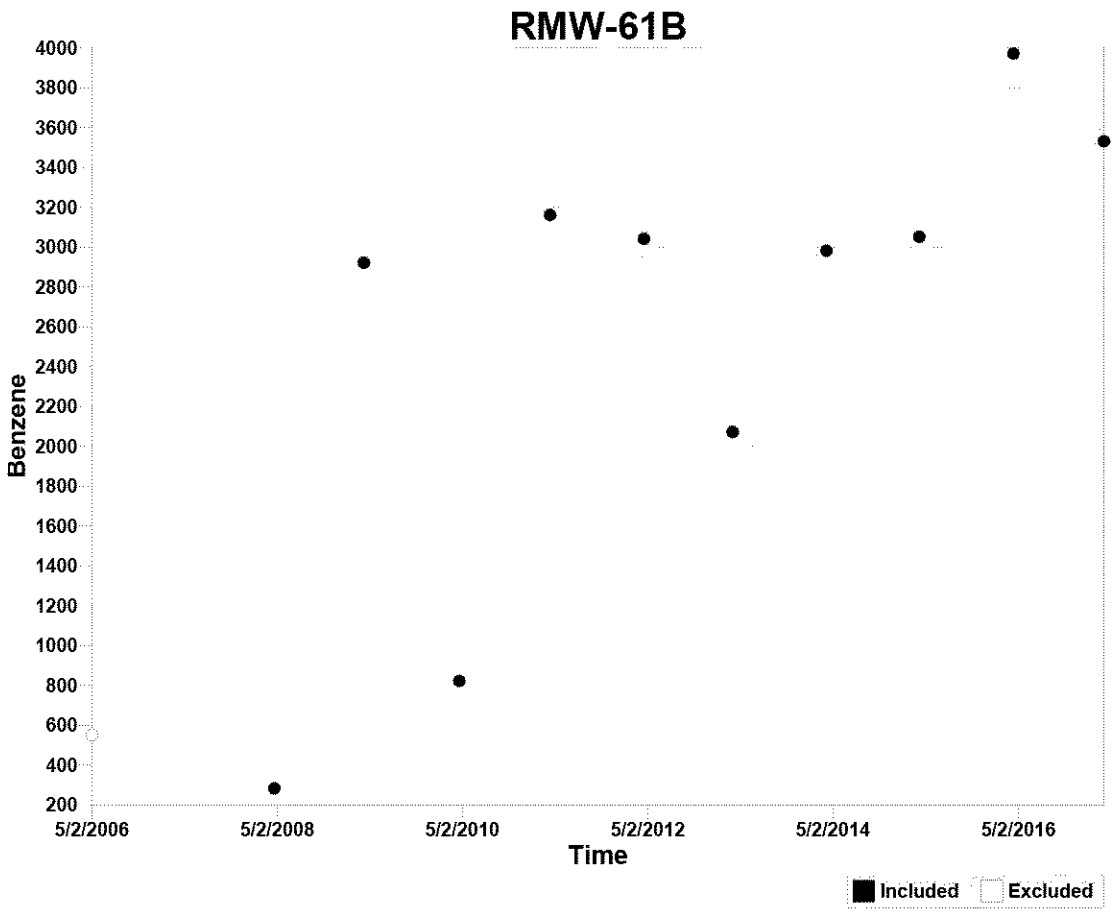
RMW-55B							
Time	Value		Time	Value		Time	Value
12/15/2005	2		4/16/2009	2		4/9/2014	2
2/8/2006	2		4/14/2010	2		4/9/2015	2
11/2/2006	2		4/13/2011	2		4/6/2016	2
1/17/2007	2		4/5/2012	2		4/6/2017	2
4/17/2008	2		4/4/2013	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



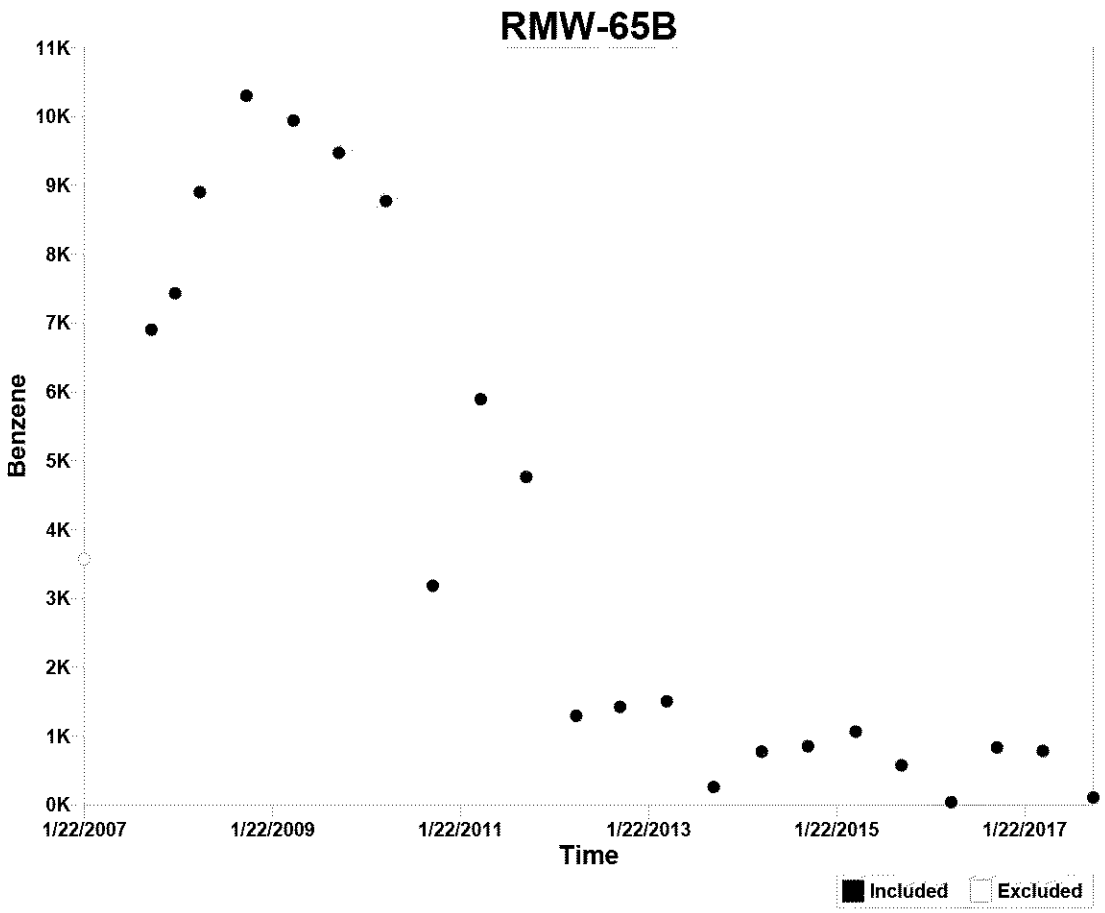
RMW-57B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
7/26/2006	*884*		10/7/2010	494		10/2/2014	180
1/17/2007	*3290*		4/12/2011	191		4/2/2015	648
10/15/2007	*1030*		10/6/2011	282		10/7/2015	118
1/9/2008	*1740*		4/17/2012	324		4/12/2016	3710
4/21/2008	*799*		10/2/2012	198		10/5/2016	14500
10/10/2008	*1900*		4/2/2013	145		4/5/2017	6900
10/8/2009	11.2		10/2/2013	153		10/20/2017	6960
4/16/2010	3910		4/7/2014	35.7			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



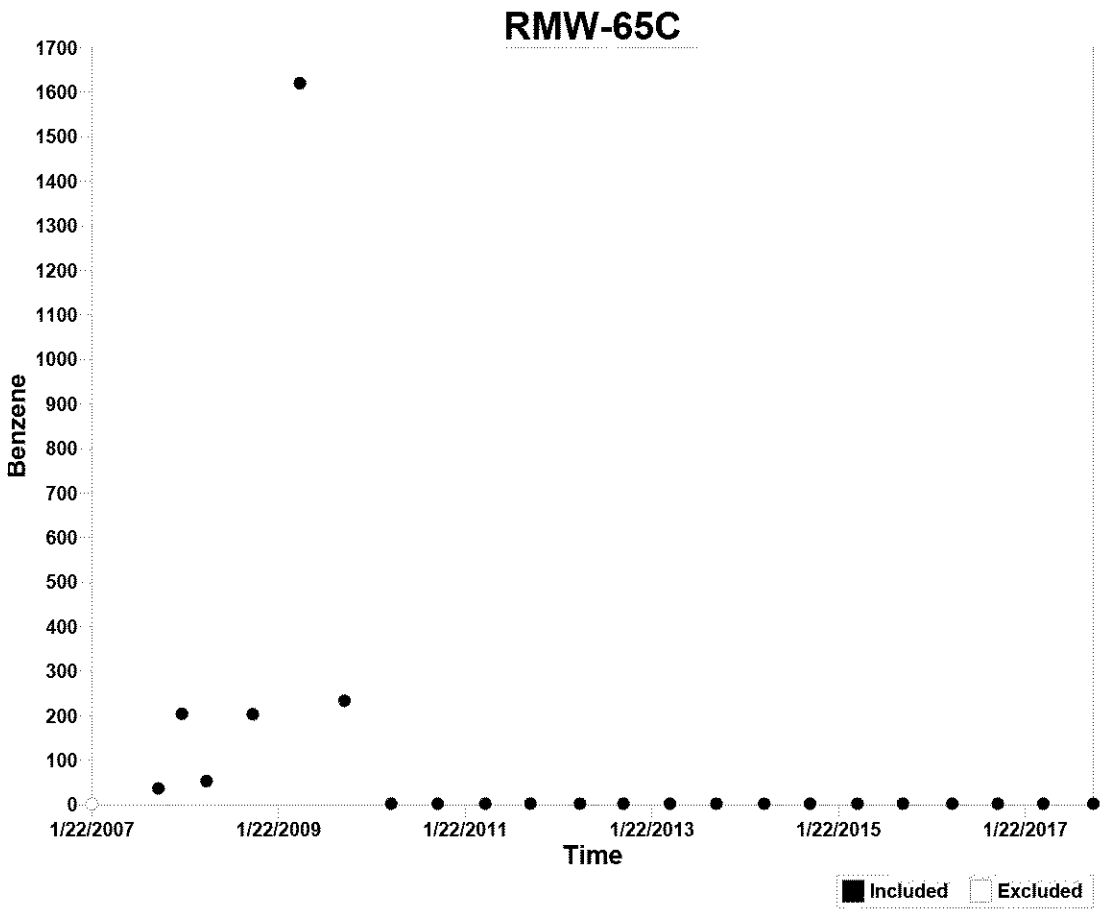
RMW-61B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
5/2/2006	*551*		4/13/2011	3160		4/8/2015	3050
4/21/2008	281		4/17/2012	3040		4/13/2016	3970
4/9/2009	2920		4/2/2013	2070		4/5/2017	3530
4/20/2010	821		4/7/2014	2980			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



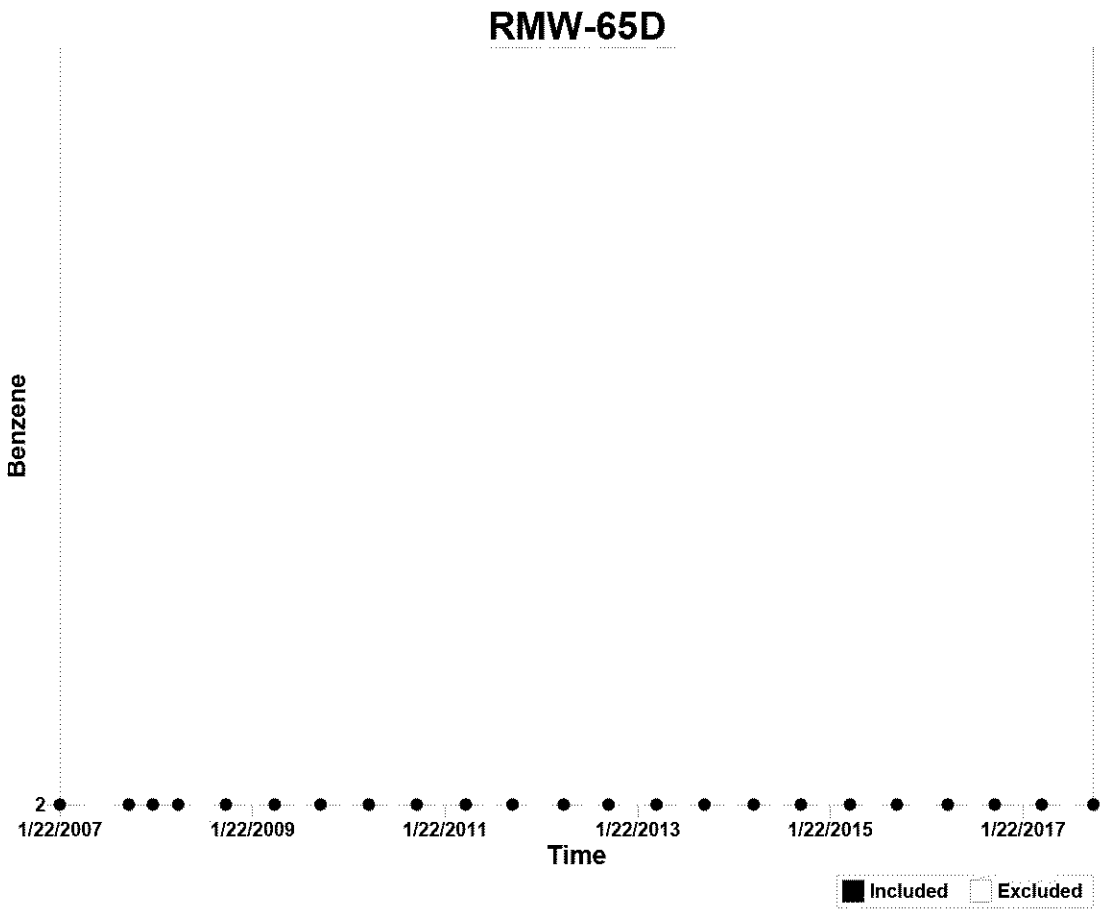
RMW-65B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
1/22/2007	*3570*		10/7/2010	3180		10/3/2014	848
10/10/2007	6900		4/11/2011	5890		4/7/2015	1060
1/10/2008	7430		10/5/2011	4760		10/2/2015	570
4/15/2008	8900		4/16/2012	1290		4/12/2016	35
10/13/2008	10300		10/3/2012	1420		10/7/2016	828
4/14/2009	9940		4/3/2013	1500		4/3/2017	779
10/7/2009	9470		10/2/2013	256		10/16/2017	102
4/8/2010	8770		4/7/2014	768			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



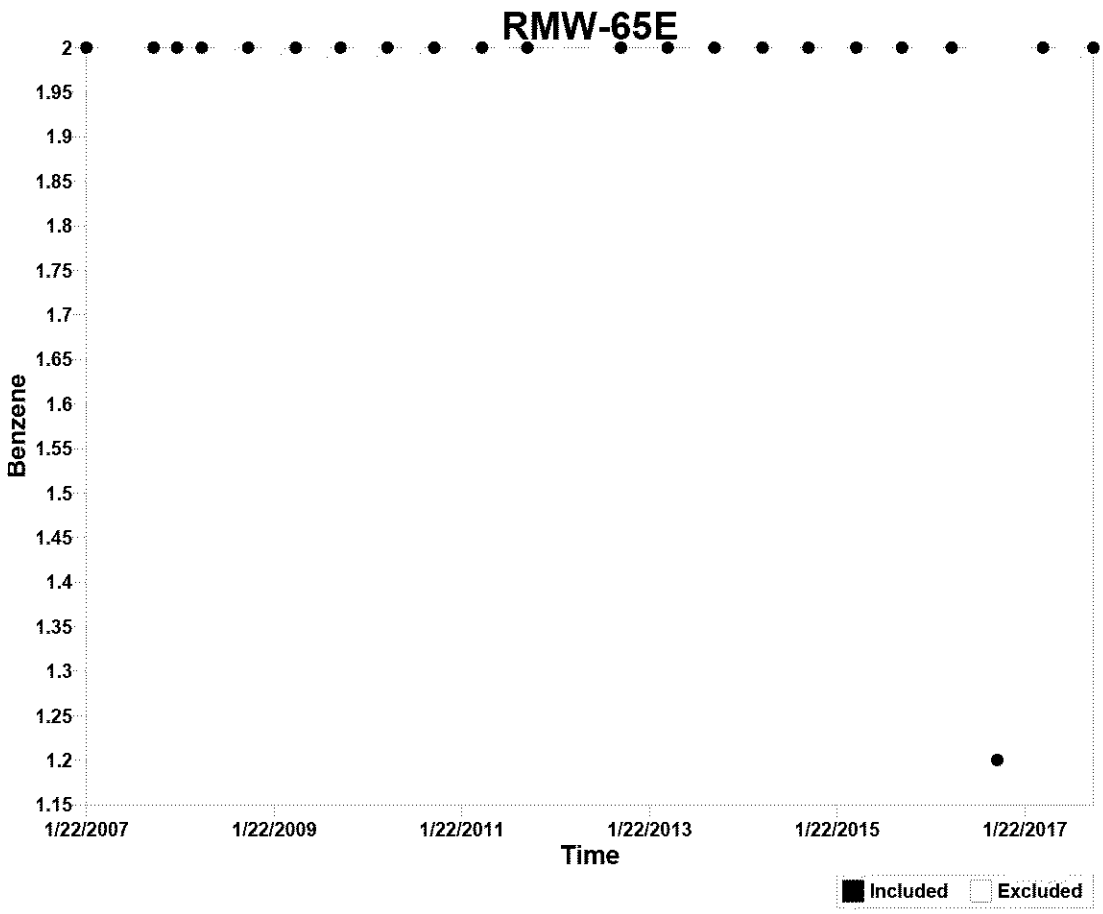
RMW-65C							
Time	Value		Time	Value		Time	Value
1/22/2007	2		10/7/2010	2		10/3/2014	2
10/10/2007	36.2		4/11/2011	2		4/7/2015	2
1/10/2008	204		10/5/2011	2		10/2/2015	2
4/15/2008	52.7		4/16/2012	2		4/12/2016	2
10/13/2008	203		10/3/2012	2		10/7/2016	2
4/16/2009	1620		4/3/2013	2		4/3/2017	2
10/7/2009	233		10/2/2013	2		10/16/2017	2
4/8/2010	2		4/7/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



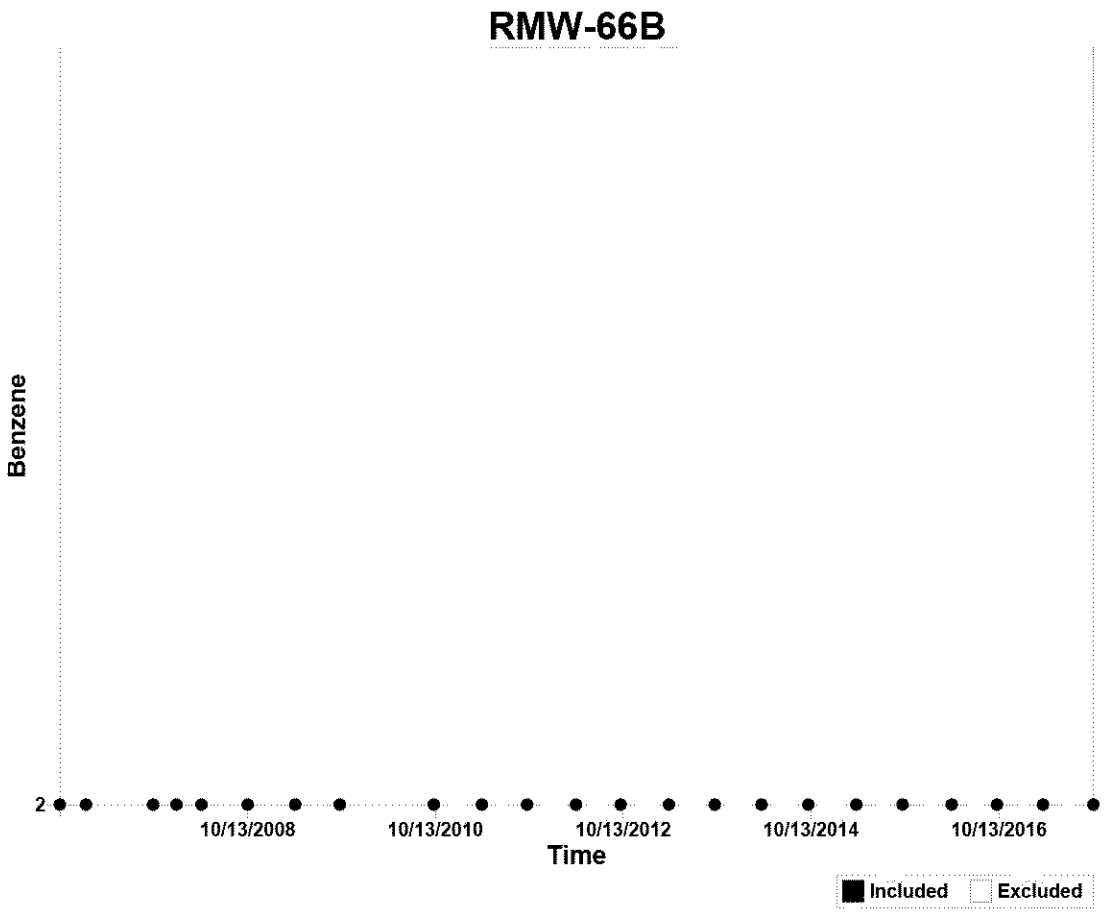
RMW-65D							
Time	Value		Time	Value		Time	Value
1/22/2007	2		10/7/2010	2		10/3/2014	2
10/11/2007	2		4/11/2011	2		4/7/2015	2
1/10/2008	2		10/5/2011	2		10/2/2015	2
4/15/2008	2		4/16/2012	2		4/12/2016	2
10/13/2008	2		10/3/2012	2		10/7/2016	2
4/16/2009	2		4/3/2013	2		4/3/2017	2
10/7/2009	2		10/2/2013	2		10/16/2017	2
4/8/2010	2		4/7/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



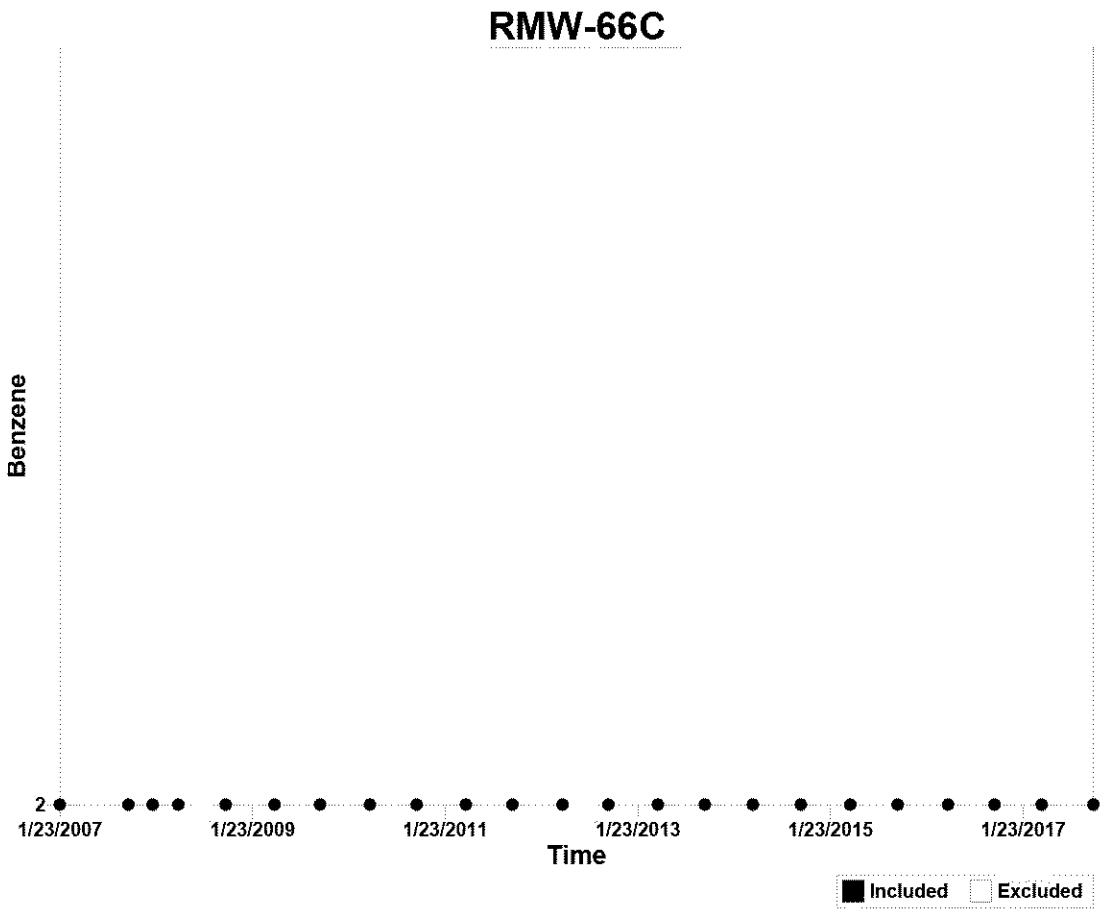
RMW-65E							
Time	Value		Time	Value		Time	Value
1/22/2007	2		10/7/2010	2		4/7/2015	2
10/11/2007	2		4/11/2011	2		10/2/2015	2
1/10/2008	2		10/5/2011	2		4/12/2016	2
4/15/2008	2		10/3/2012	2		10/7/2016	1.2
10/13/2008	2		4/3/2013	2		4/3/2017	2
4/16/2009	2		10/2/2013	2		10/16/2017	2
10/7/2009	2		4/7/2014	2			
4/8/2010	2		10/3/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



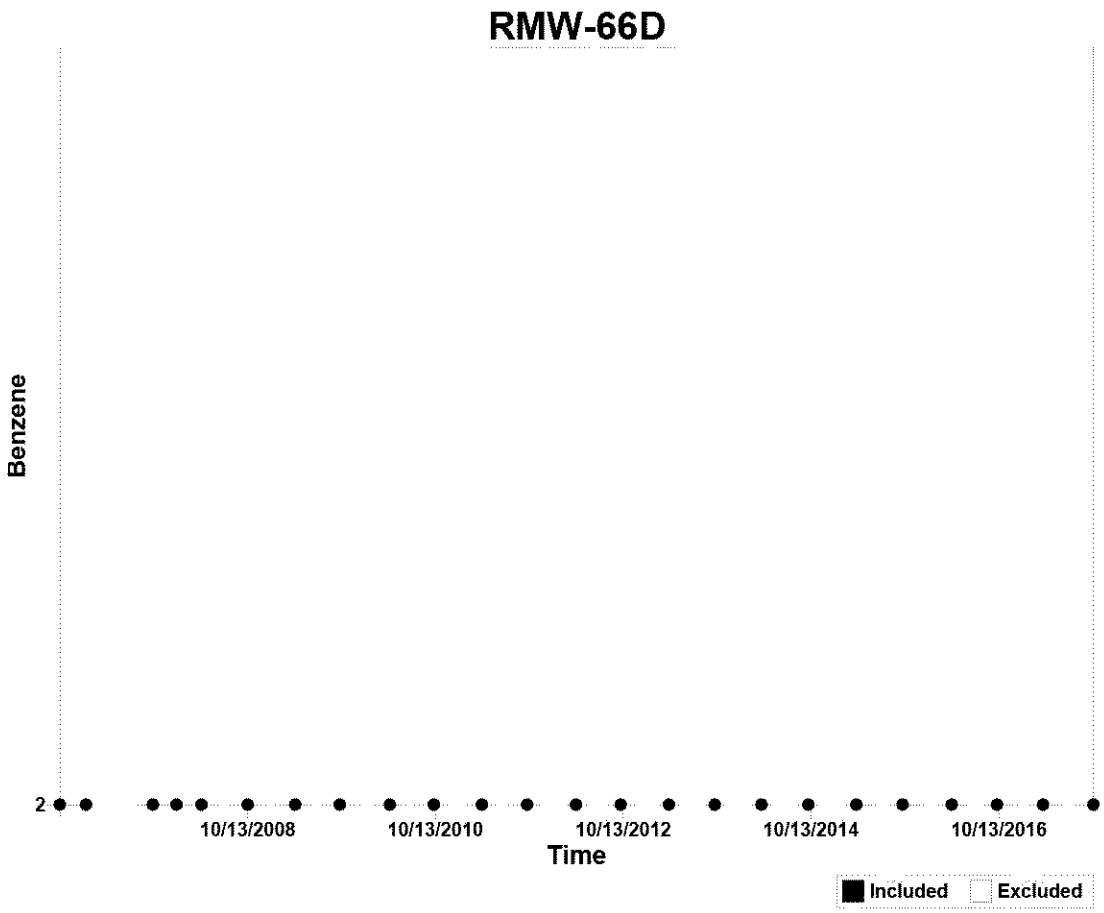
RMW-66B							
Time	Value		Time	Value		Time	Value
10/13/2006	2		10/7/2010	2		10/3/2014	2
1/23/2007	2		4/12/2011	2		4/8/2015	2
10/11/2007	2		10/5/2011	2		10/5/2015	2
1/10/2008	2		4/12/2012	2		4/13/2016	2
4/16/2008	2		10/3/2012	2		10/6/2016	2
10/13/2008	2		4/9/2013	2		4/3/2017	2
4/16/2009	2		10/4/2013	2		10/16/2017	2
10/6/2009	2		4/4/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-66C							
Time	Value		Time	Value		Time	Value
1/23/2007	2		10/7/2010	2		10/3/2014	2
10/10/2007	2		4/12/2011	2		4/8/2015	2
1/10/2008	2		10/5/2011	2		10/5/2015	2
4/16/2008	2		4/12/2012	2		4/13/2016	2
10/13/2008	2		10/3/2012	2		10/6/2016	2
4/16/2009	2		4/9/2013	2		4/3/2017	2
10/6/2009	2		10/4/2013	2		10/16/2017	2
4/13/2010	2		4/4/2014	2			

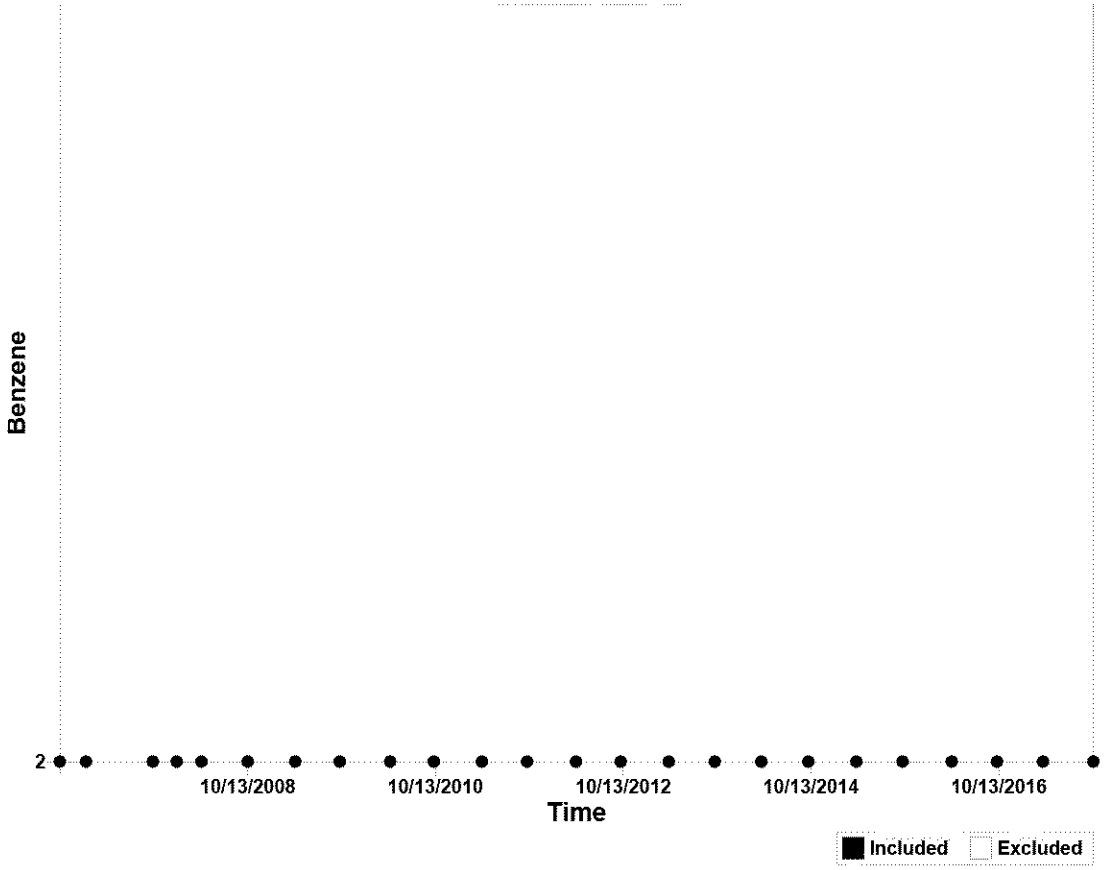
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-66D							
Time	Value		Time	Value		Time	Value
10/13/2006	2		4/19/2010	2		4/4/2014	2
1/23/2007	2		10/7/2010	2		10/3/2014	2
10/10/2007	2		4/12/2011	2		4/8/2015	2
1/10/2008	2		10/5/2011	2		10/5/2015	2
4/16/2008	2		4/12/2012	2		4/13/2016	2
10/13/2008	2		10/3/2012	2		10/6/2016	2
4/16/2009	2		4/9/2013	2		4/3/2017	2
10/6/2009	2		10/4/2013	2		10/16/2017	2

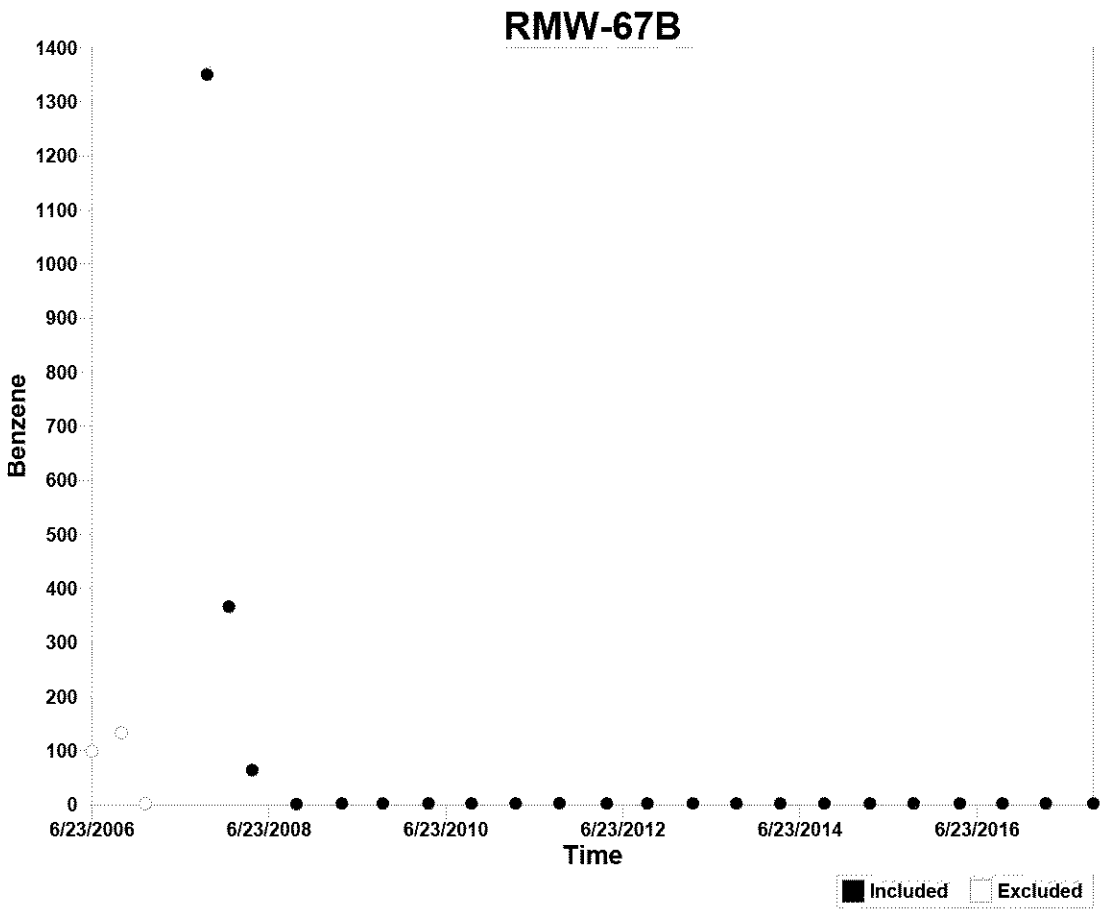
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-66E



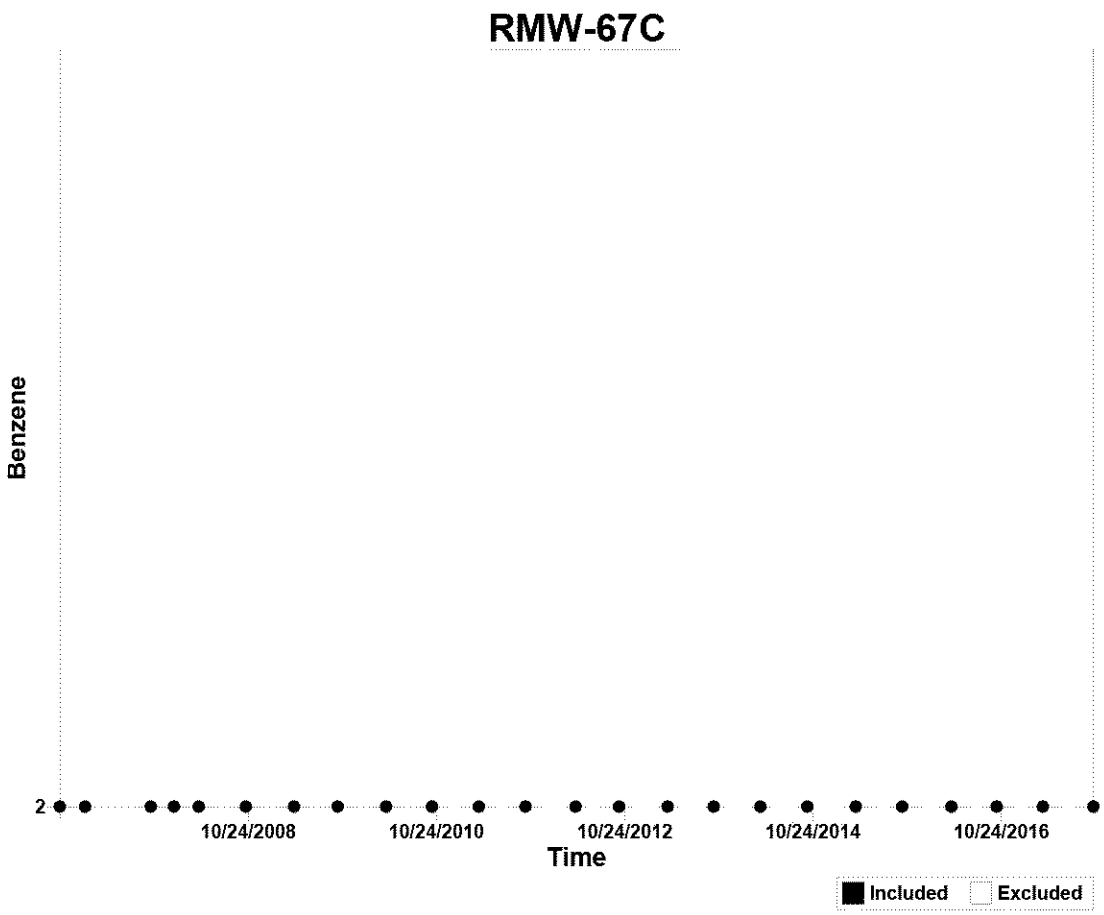
RMW-66E							
Time	Value		Time	Value		Time	Value
10/13/2006	2		4/20/2010	2		4/3/2014	2
1/23/2007	2		10/7/2010	2		10/3/2014	2
10/10/2007	2		4/12/2011	2		4/8/2015	2
1/11/2008	2		10/5/2011	2		10/5/2015	2
4/16/2008	2		4/12/2012	2		4/13/2016	2
10/13/2008	2		10/3/2012	2		10/6/2016	2
4/16/2009	2		4/8/2013	2		4/3/2017	2
10/6/2009	2		10/4/2013	2		10/16/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



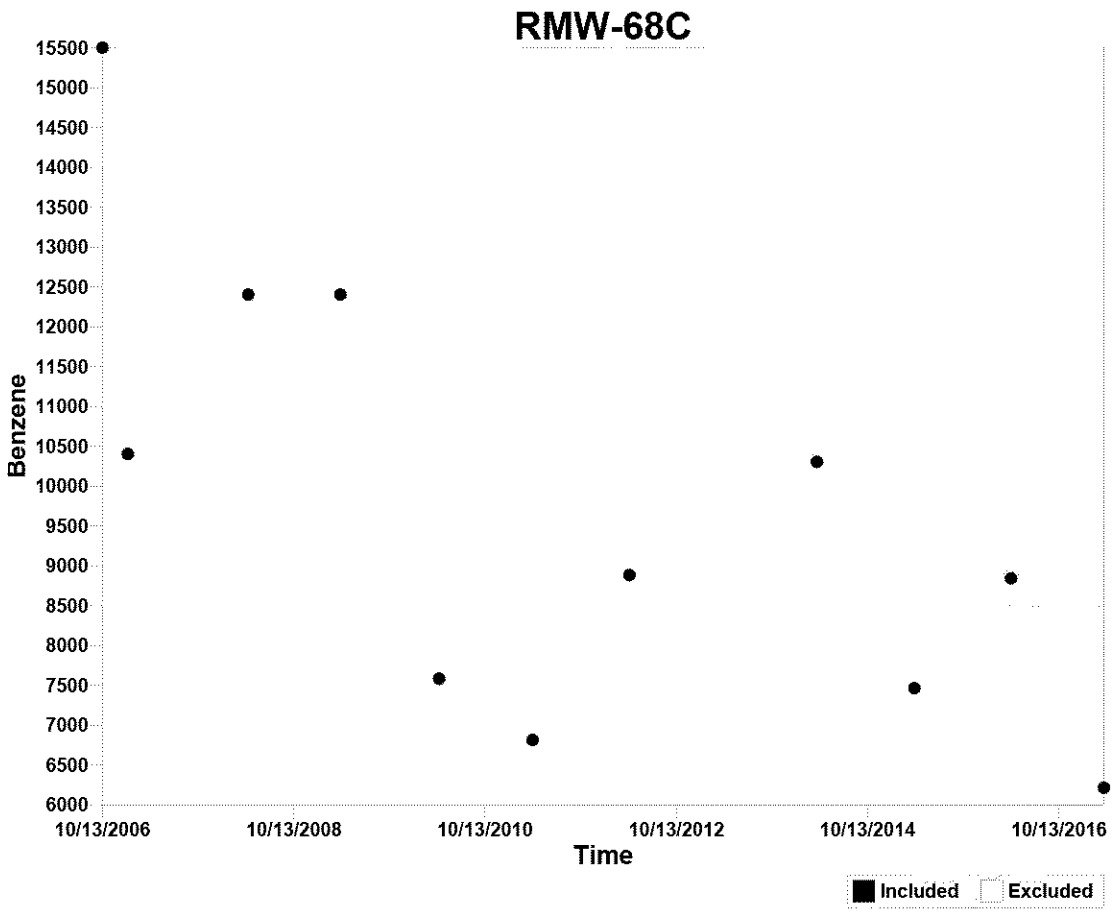
RMW-67B							
Time	**Value**		**Time**	**Value**		**Time**	**Value**
6/23/2006	*99.2*		4/13/2010	2		10/2/2014	2
10/23/2006	*133*		10/7/2010	2		4/8/2015	2
1/30/2007	*2*		4/7/2011	2		10/5/2015	2
10/12/2007	1350		10/5/2011	2.5		4/13/2016	2
1/10/2008	366		4/17/2012	2		10/6/2016	2
4/15/2008	63.8		10/2/2012	2		4/3/2017	2
10/15/2008	0.8		4/8/2013	2		10/16/2017	2
4/20/2009	2		10/4/2013	2			
10/6/2009	2		4/3/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



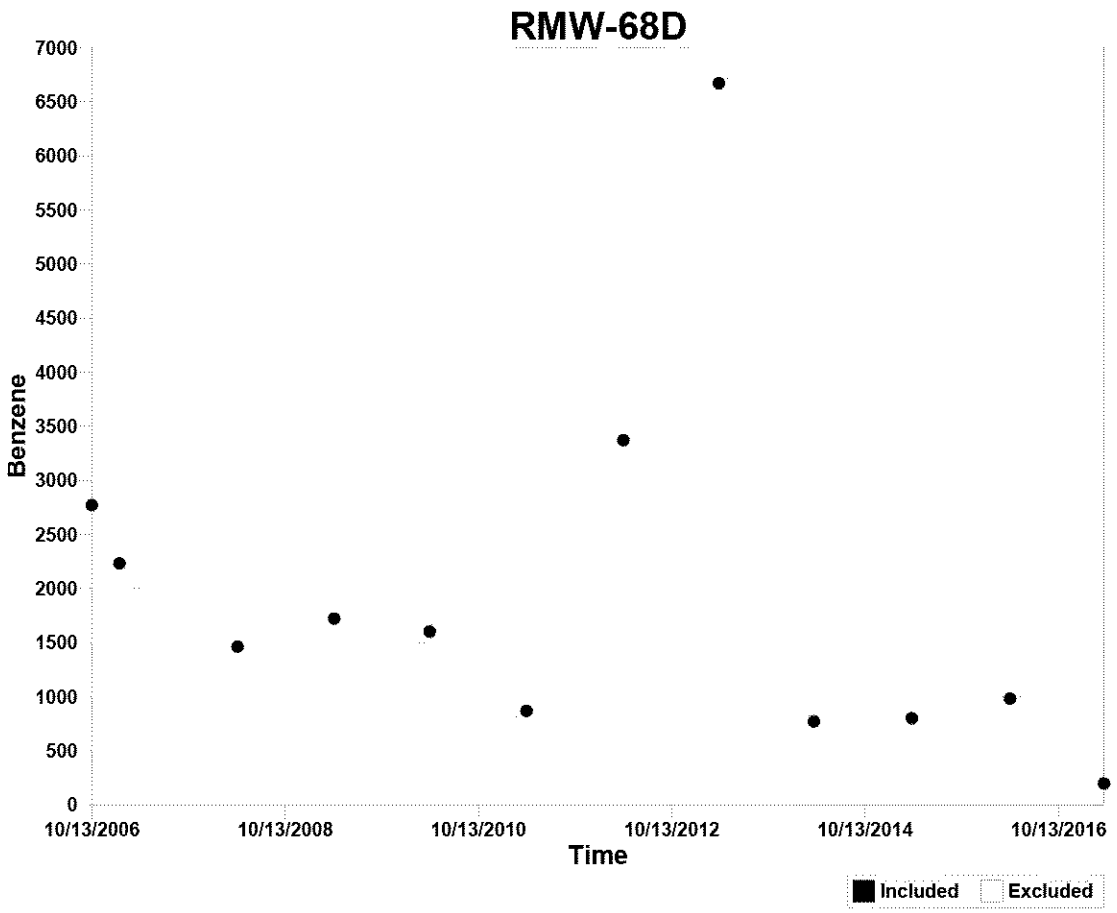
RMW-67C							
Time	Value		Time	Value		Time	Value
10/24/2006	2		4/12/2010	2		4/3/2014	2
1/30/2007	2		10/7/2010	2		10/2/2014	2
10/12/2007	2		4/7/2011	2		4/8/2015	2
1/10/2008	2		10/5/2011	2		10/5/2015	2
4/15/2008	2		4/16/2012	2		4/13/2016	2
10/15/2008	2		10/2/2012	2		10/6/2016	2
4/20/2009	2		4/8/2013	2		4/3/2017	2
10/6/2009	2		10/4/2013	2		10/16/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



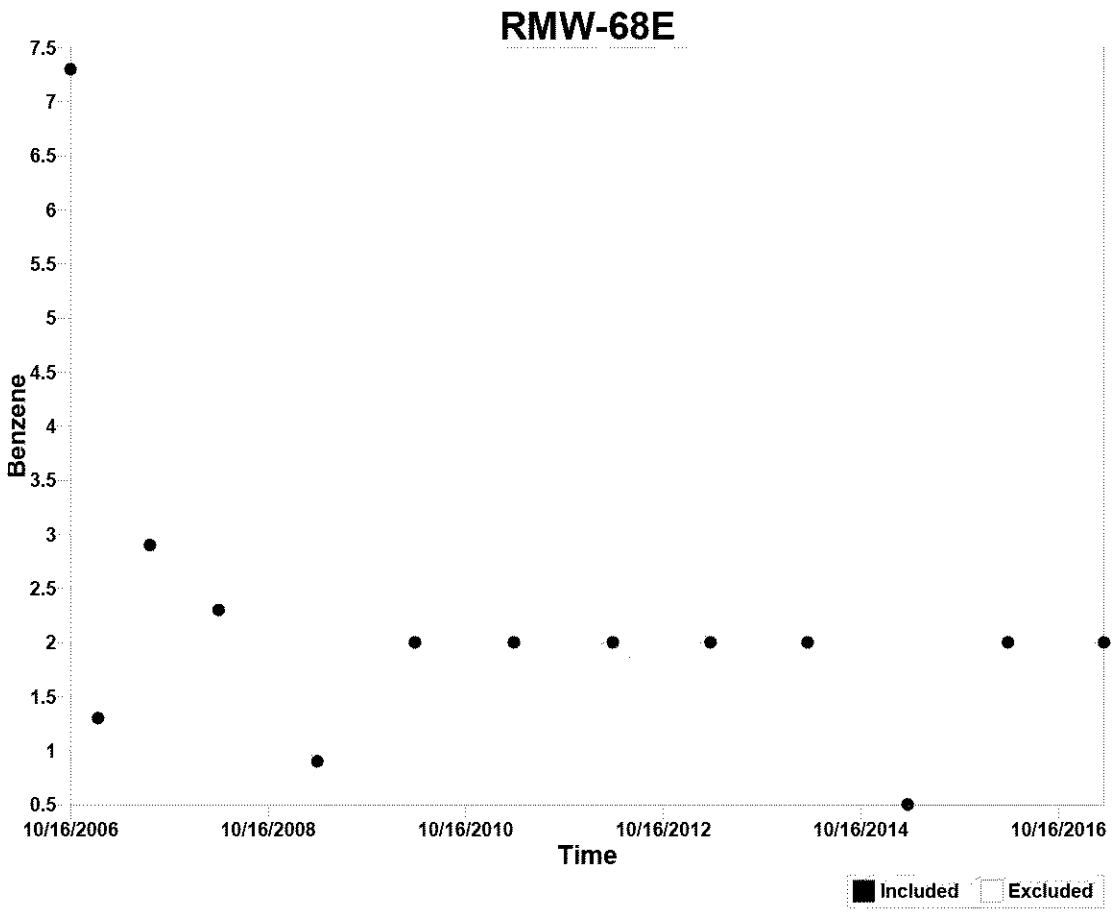
RMW-68C							
Time	Value		Time	Value		Time	Value
10/13/2006	15500		4/21/2010	7580		4/10/2015	7460
1/18/2007	10400		4/13/2011	6810		4/13/2016	8840
4/22/2008	12400		4/17/2012	8880		4/3/2017	6210
4/9/2009	12400		4/3/2014	10300			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



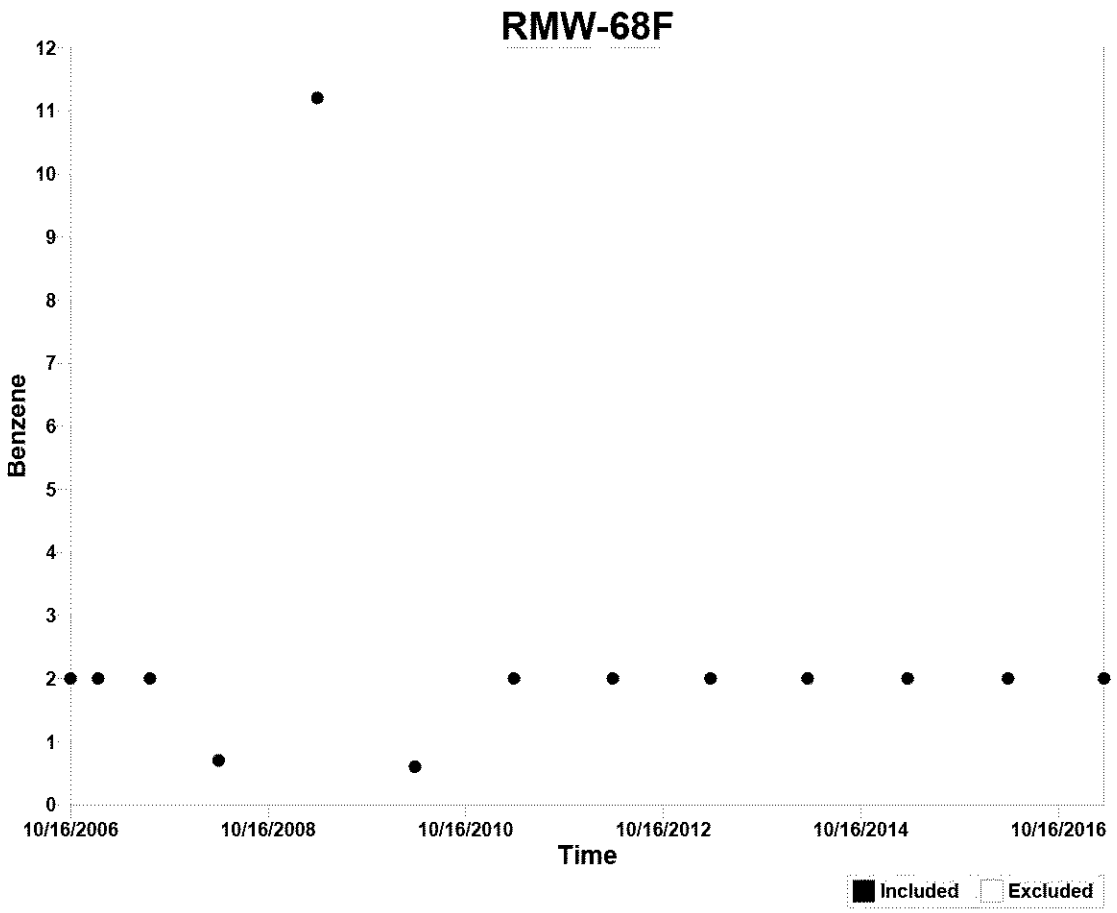
RMW-68D							
Time	Value		Time	Value		Time	Value
10/13/2006	2770		4/12/2010	1600		4/3/2014	768
1/26/2007	2230		4/13/2011	866		4/8/2015	798
4/16/2008	1460		4/13/2012	3370		4/13/2016	979
4/16/2009	1720		4/9/2013	6670		4/3/2017	195

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



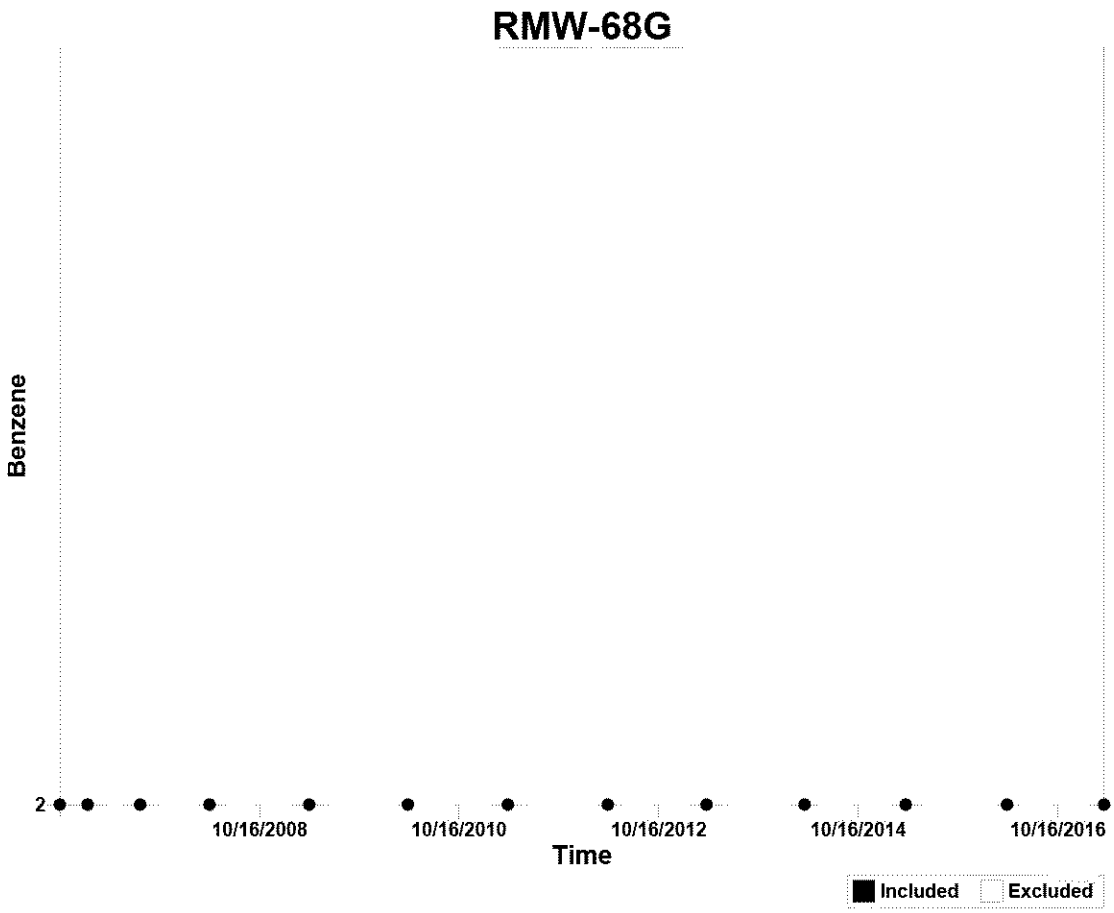
RMW-68E								
Time	Value		Time	Value		Time	Value
10/16/2006	7.3		4/12/2010	2		4/8/2015	0.5
1/26/2007	1.3		4/13/2011	2		4/13/2016	2
8/6/2007	2.9		4/13/2012	2		4/3/2017	2
4/16/2008	2.3		4/9/2013	2			
4/16/2009	0.9		4/3/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



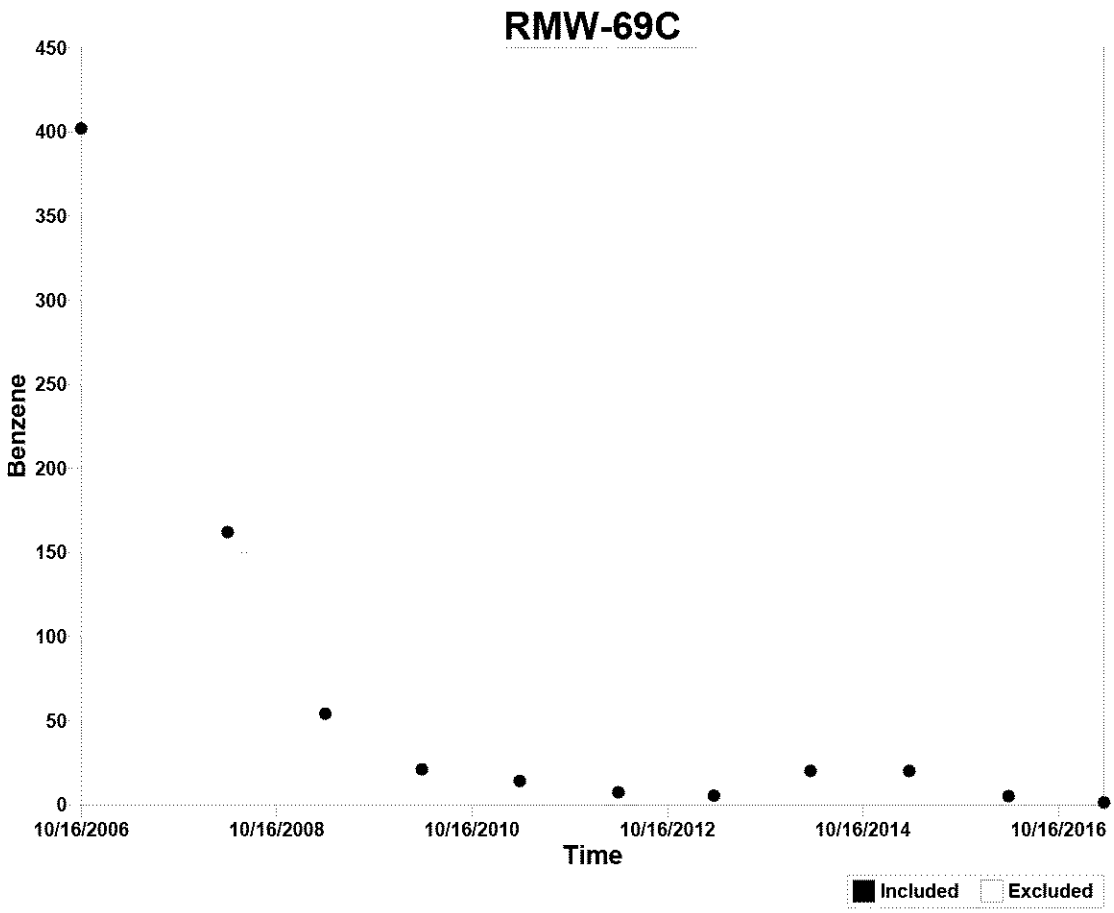
RMW-68F								
Time	Value		Time	Value		Time	Value
10/16/2006	2		4/12/2010	0.6		4/8/2015	2
1/26/2007	2		4/13/2011	2		4/13/2016	2
8/6/2007	2		4/13/2012	2		4/3/2017	2
4/16/2008	0.7		4/9/2013	2			
4/16/2009	11.2		4/3/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



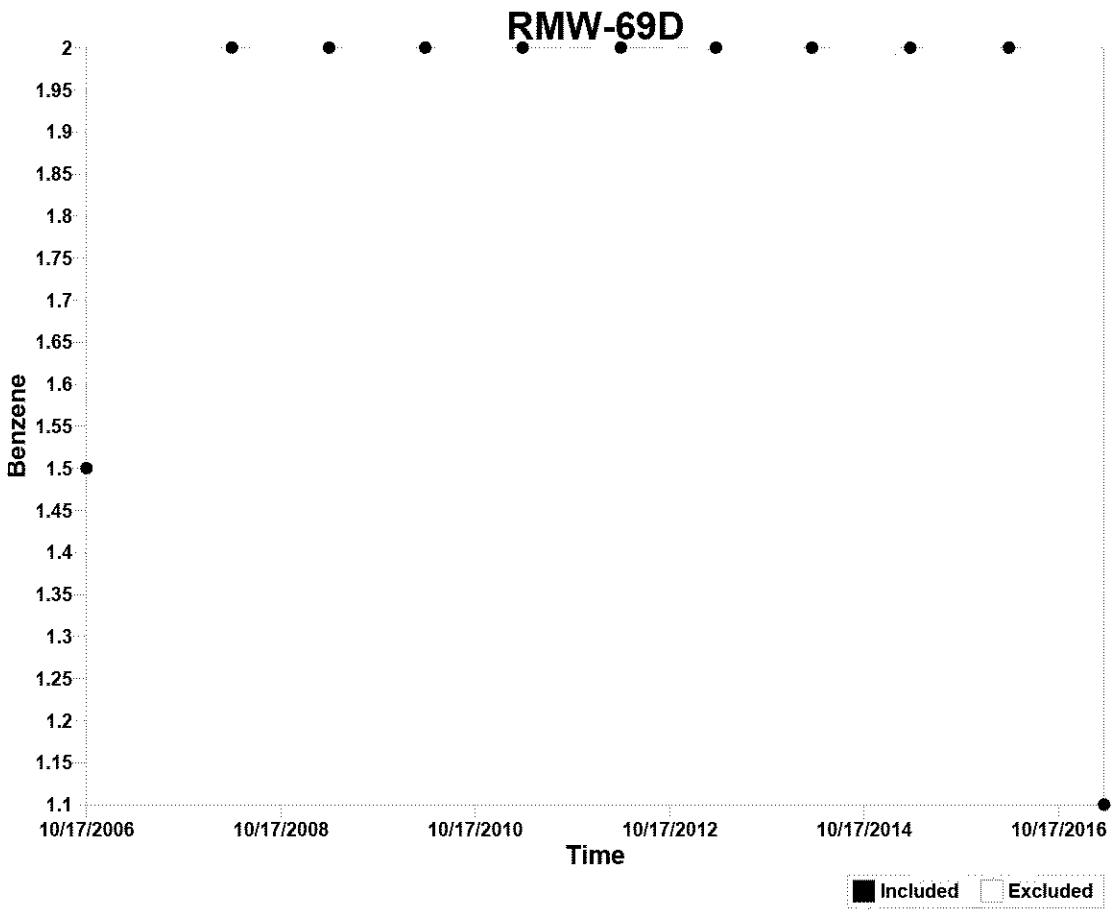
RMW-68G							
Time	Value		Time	Value		Time	Value
10/16/2006	2		4/12/2010	2		4/8/2015	2
1/26/2007	2		4/13/2011	2		4/13/2016	2
8/6/2007	2		4/13/2012	2		4/3/2017	2
4/16/2008	2		4/9/2013	2			
4/16/2009	2		4/3/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



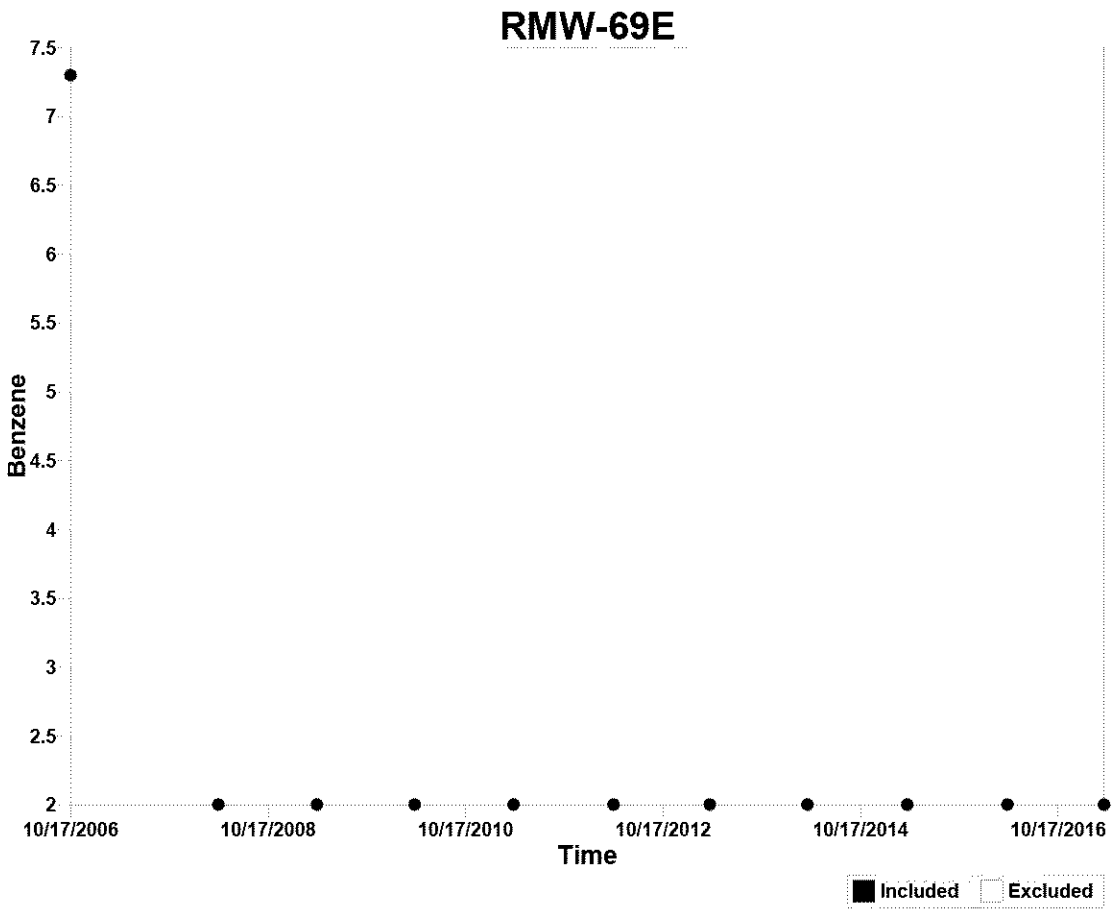
RMW-69C							
Time	Value		Time	Value		Time	Value
10/16/2006	402		4/13/2011	14		4/8/2015	20
4/16/2008	162		4/16/2012	7.3		4/13/2016	5
4/16/2009	54		4/8/2013	5.3		4/5/2017	1.3
4/12/2010	21		4/4/2014	20			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



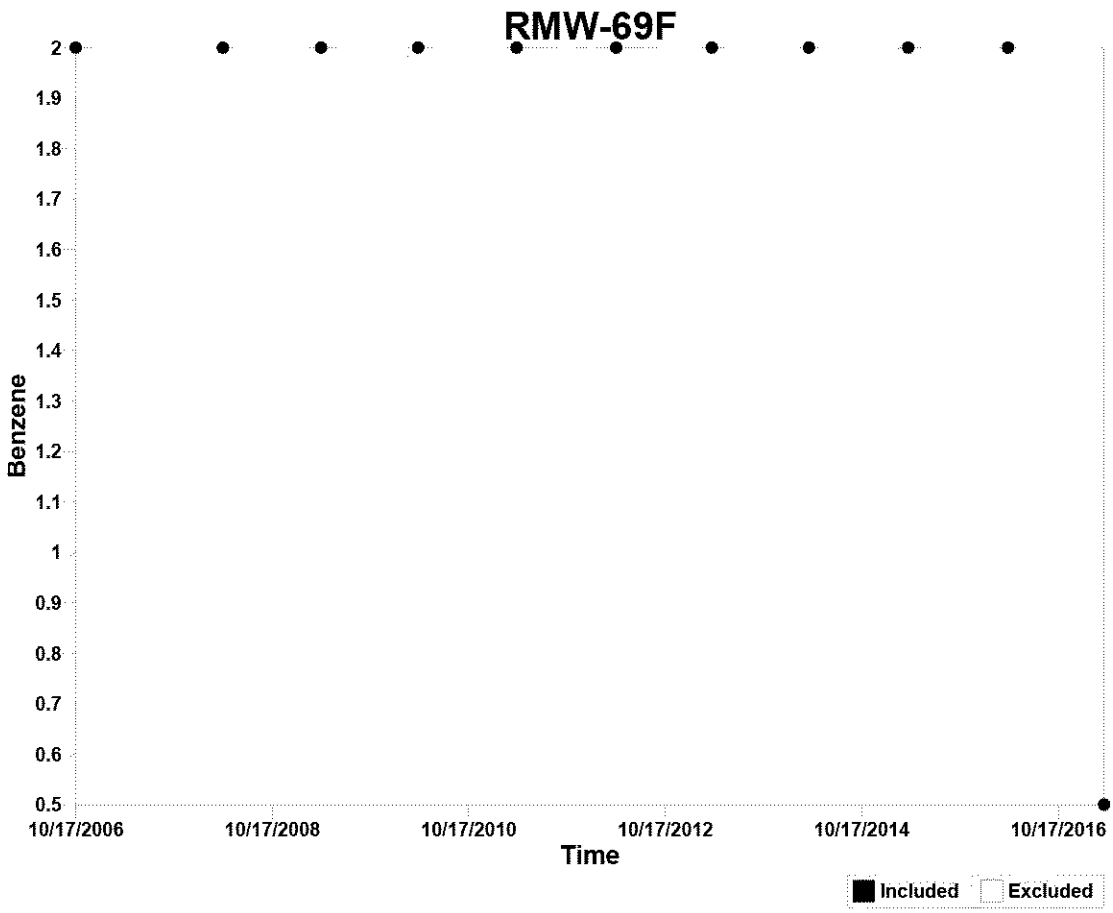
RMW-69D							
Time	Value		Time	Value		Time	Value
10/17/2006	1.5		4/13/2011	2		4/8/2015	2
4/16/2008	2		4/16/2012	2		4/13/2016	2
4/16/2009	2		4/8/2013	2		4/5/2017	1.1
4/12/2010	2		4/4/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



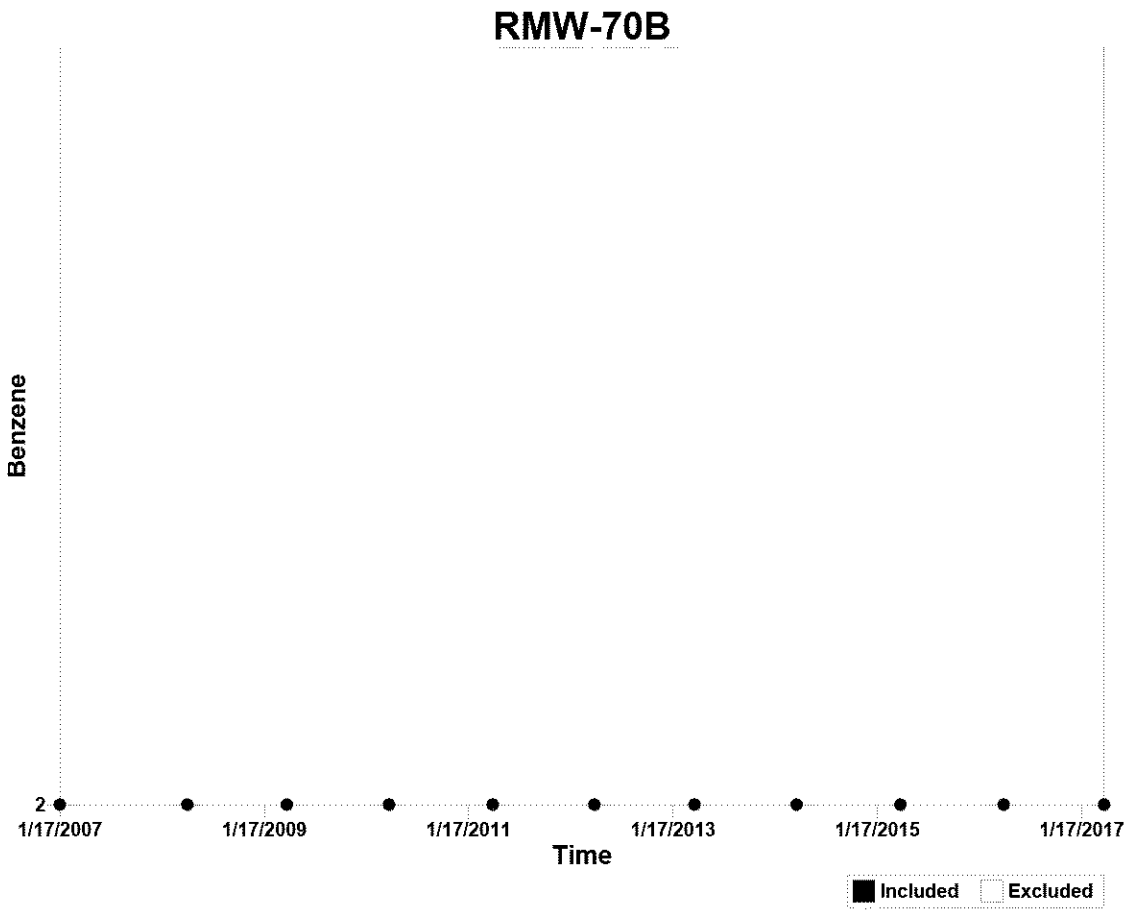
RMW-69E							
Time	Value		Time	Value		Time	Value
10/17/2006	7.3		4/13/2011	2		4/8/2015	2
4/16/2008	2		4/17/2012	2		4/13/2016	2
4/16/2009	2		4/8/2013	2		4/5/2017	2
4/12/2010	2		4/4/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



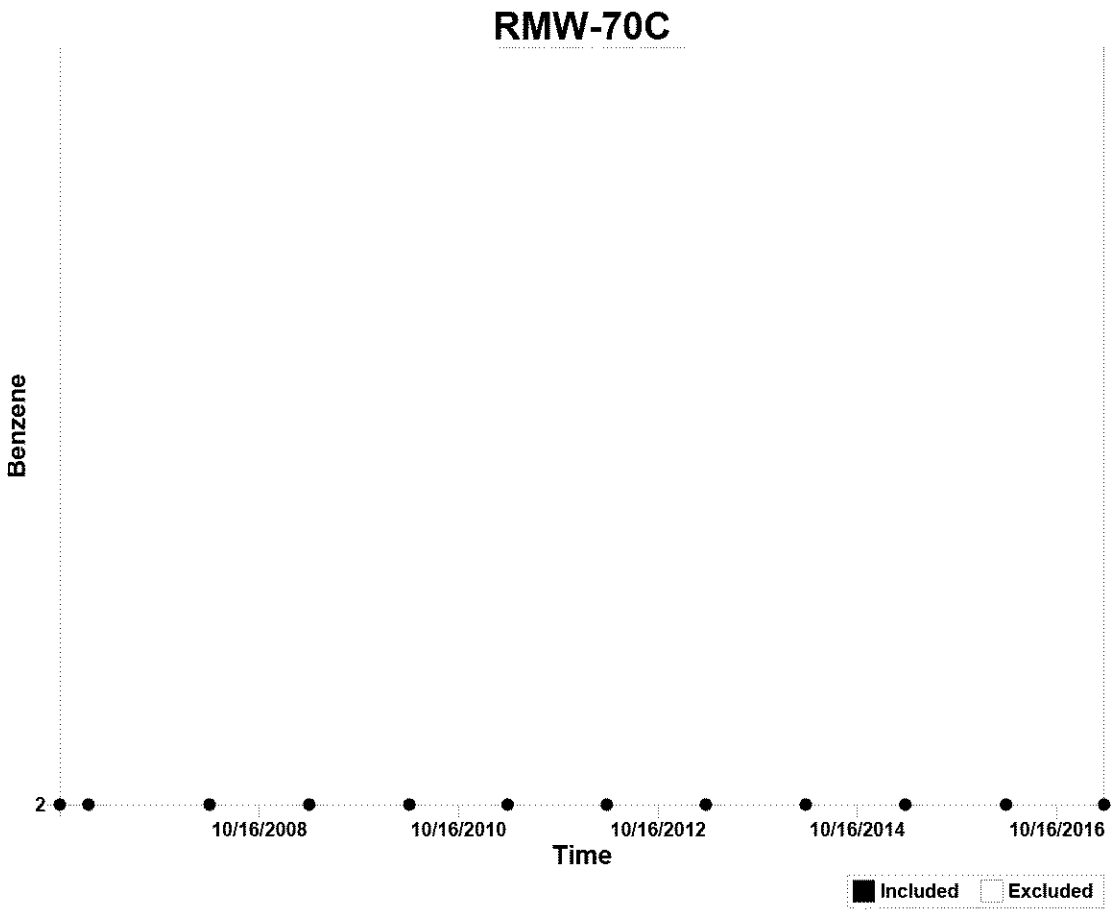
RMW-69F							
Time	Value		Time	Value		Time	Value
10/17/2006	2		4/13/2011	2		4/8/2015	2
4/16/2008	2		4/17/2012	2		4/13/2016	2
4/16/2009	2		4/8/2013	2		4/5/2017	0.5
4/12/2010	2		4/4/2014	2			

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-70B							
Time	Value		Time	Value		Time	Value
1/17/2007	2		4/14/2011	2		4/10/2015	2
4/17/2008	2		4/11/2012	2		4/13/2016	2
4/8/2009	2		4/4/2013	2		4/7/2017	2
4/8/2010	2		4/4/2014	2			

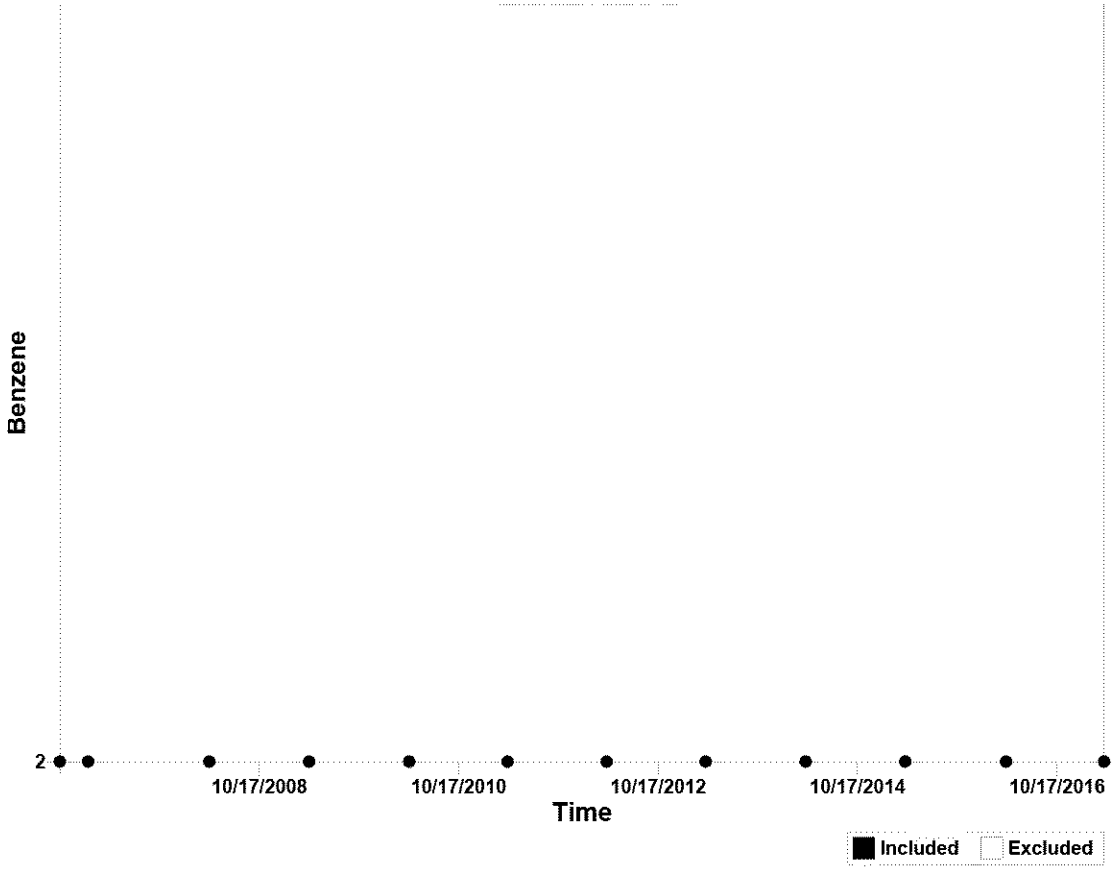
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-70C							
Time	Value		Time	Value		Time	Value
10/16/2006	2		4/19/2010	2		4/10/2014	2
1/29/2007	2		4/14/2011	2		4/10/2015	2
4/17/2008	2		4/11/2012	2		4/13/2016	2
4/17/2009	2		4/9/2013	2		4/7/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

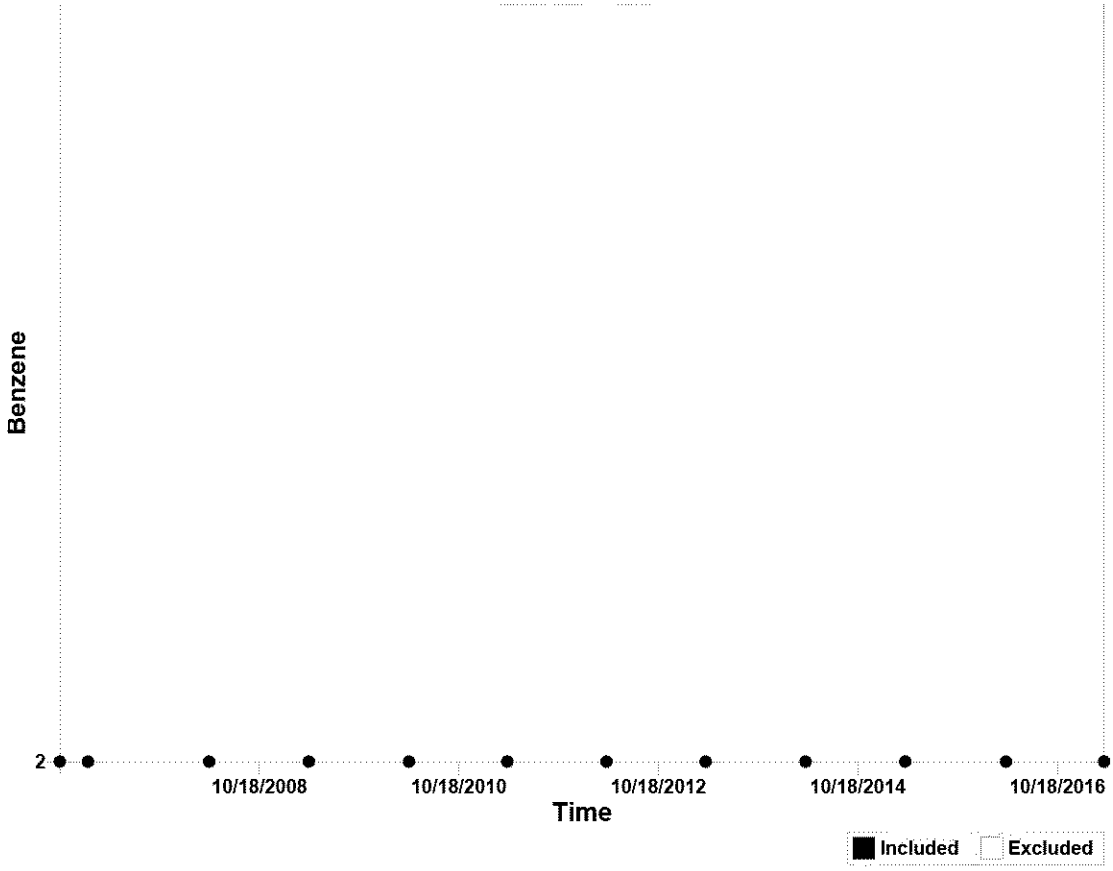
RMW-70D



RMW-70D							
Time	Value		Time	Value		Time	Value
10/17/2006	2		4/19/2010	2		4/10/2014	2
1/29/2007	2		4/14/2011	2		4/10/2015	2
4/17/2008	2		4/11/2012	2		4/13/2016	2
4/17/2009	2		4/9/2013	2		4/7/2017	2

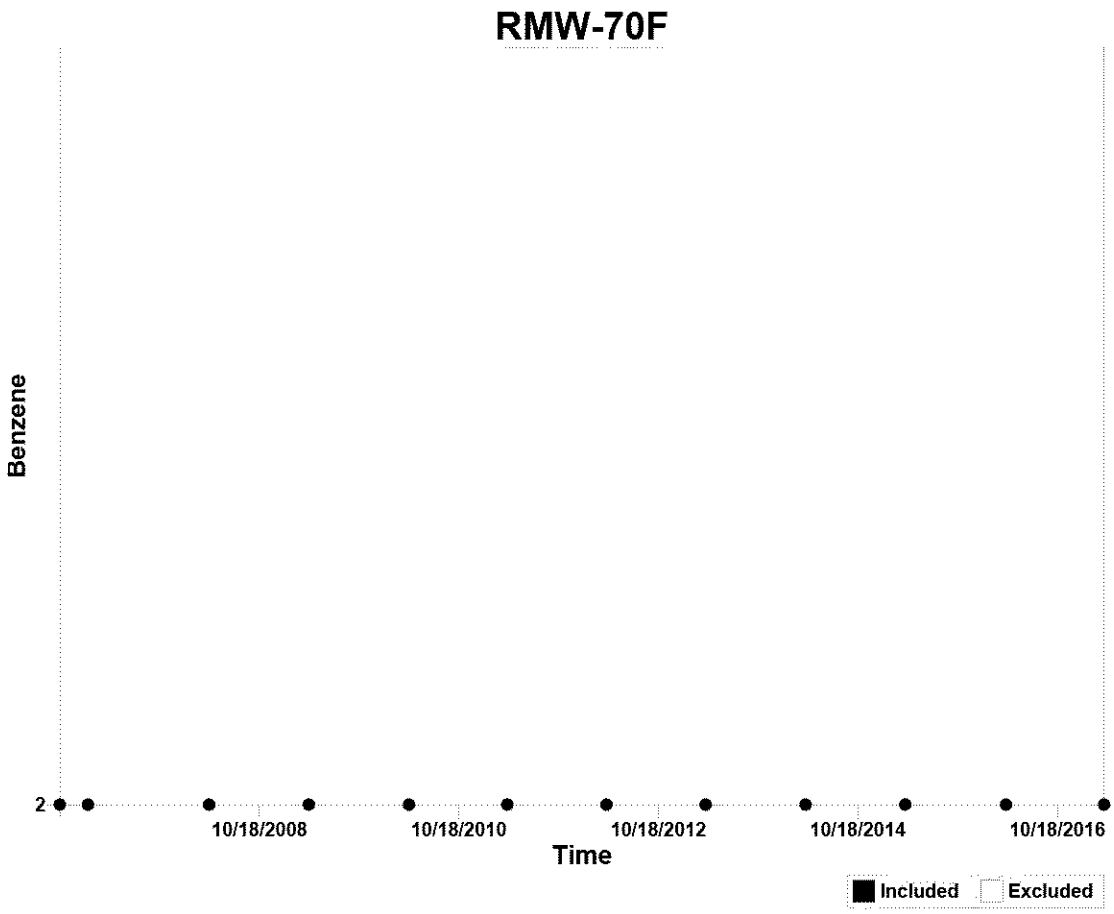
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-70E



RMW-70E							
Time	Value		Time	Value		Time	Value
10/18/2006	2		4/19/2010	2		4/10/2014	2
1/29/2007	2		4/14/2011	2		4/10/2015	2
4/17/2008	2		4/11/2012	2		4/13/2016	2
4/17/2009	2		4/9/2013	2		4/7/2017	2

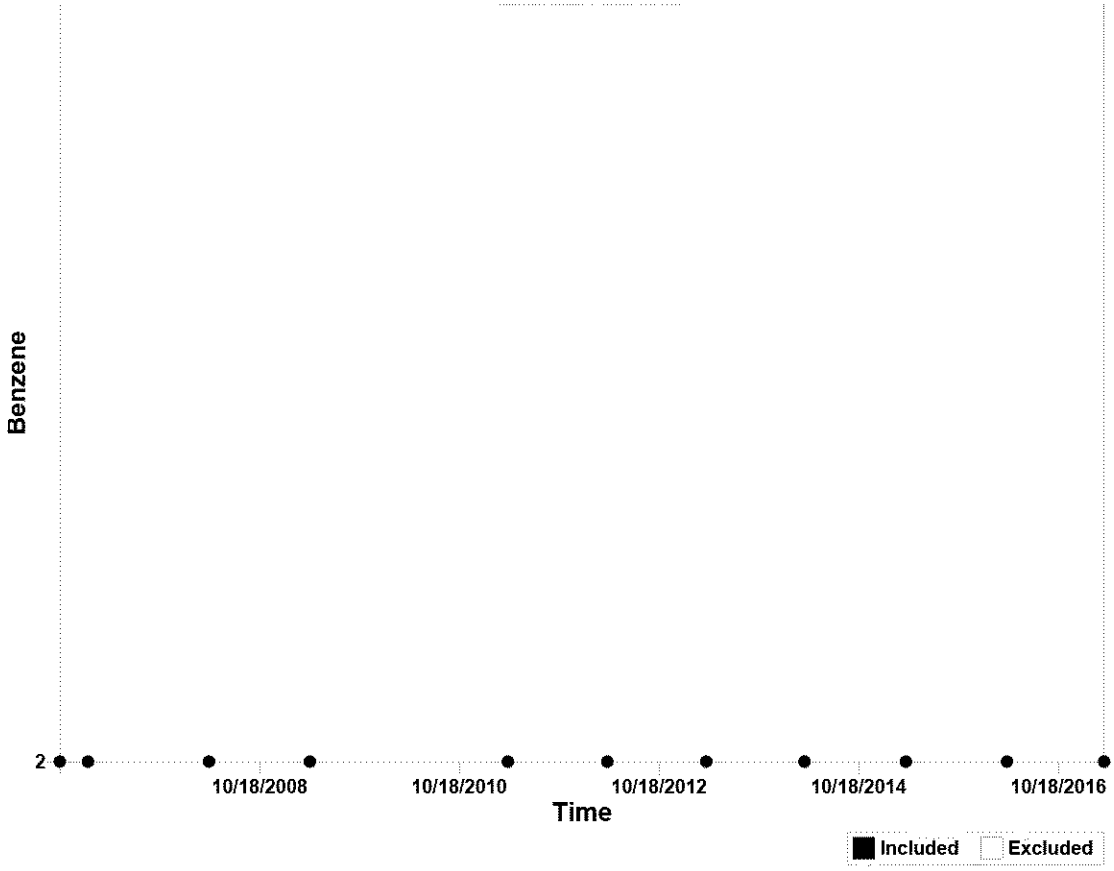
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-70F							
Time	Value		Time	Value		Time	Value
10/18/2006	2		4/19/2010	2		4/10/2014	2
1/29/2007	2		4/14/2011	2		4/10/2015	2
4/17/2008	2		4/11/2012	2		4/13/2016	2
4/17/2009	2		4/9/2013	2		4/7/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

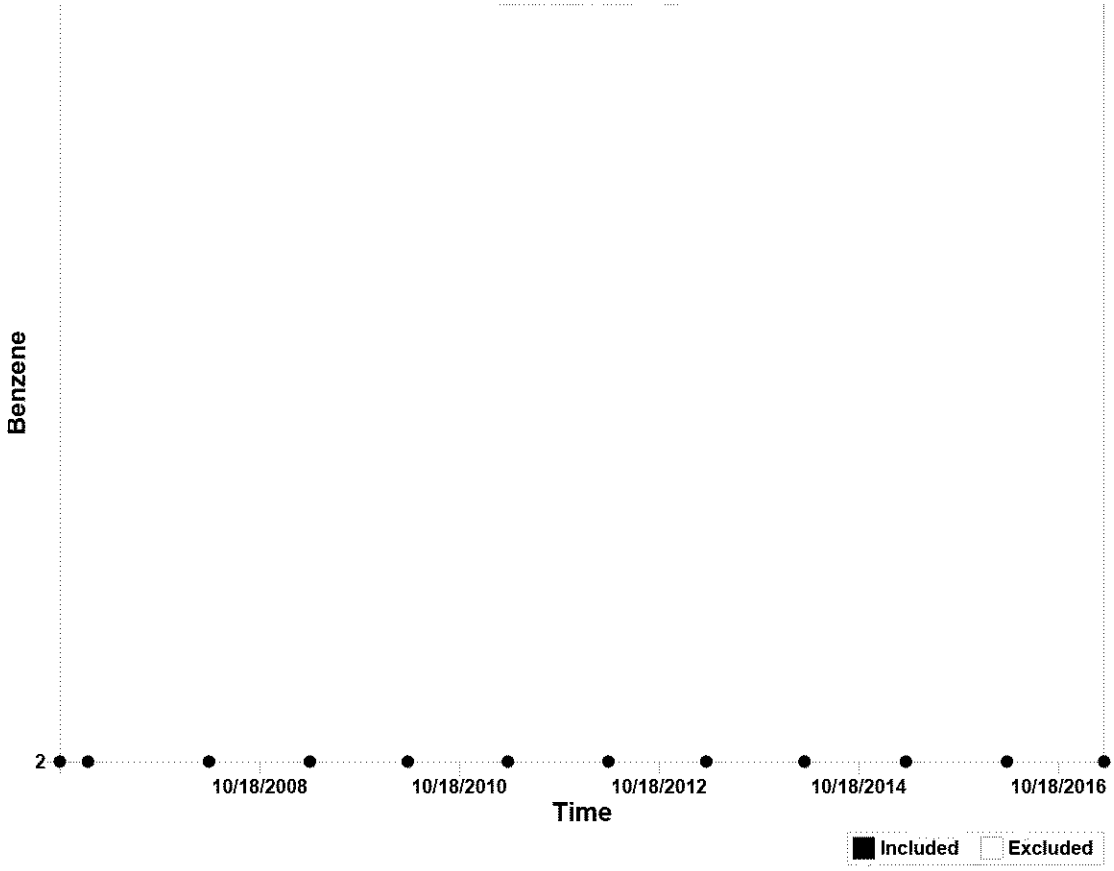
RMW-71A



RMW-71A							
Time	Value		Time	Value		Time	Value
10/18/2006	2		4/14/2011	2		4/9/2015	2
1/29/2007	2		4/12/2012	2		4/13/2016	2
4/16/2008	2		4/9/2013	2		4/3/2017	2
4/20/2009	2		4/3/2014	2			

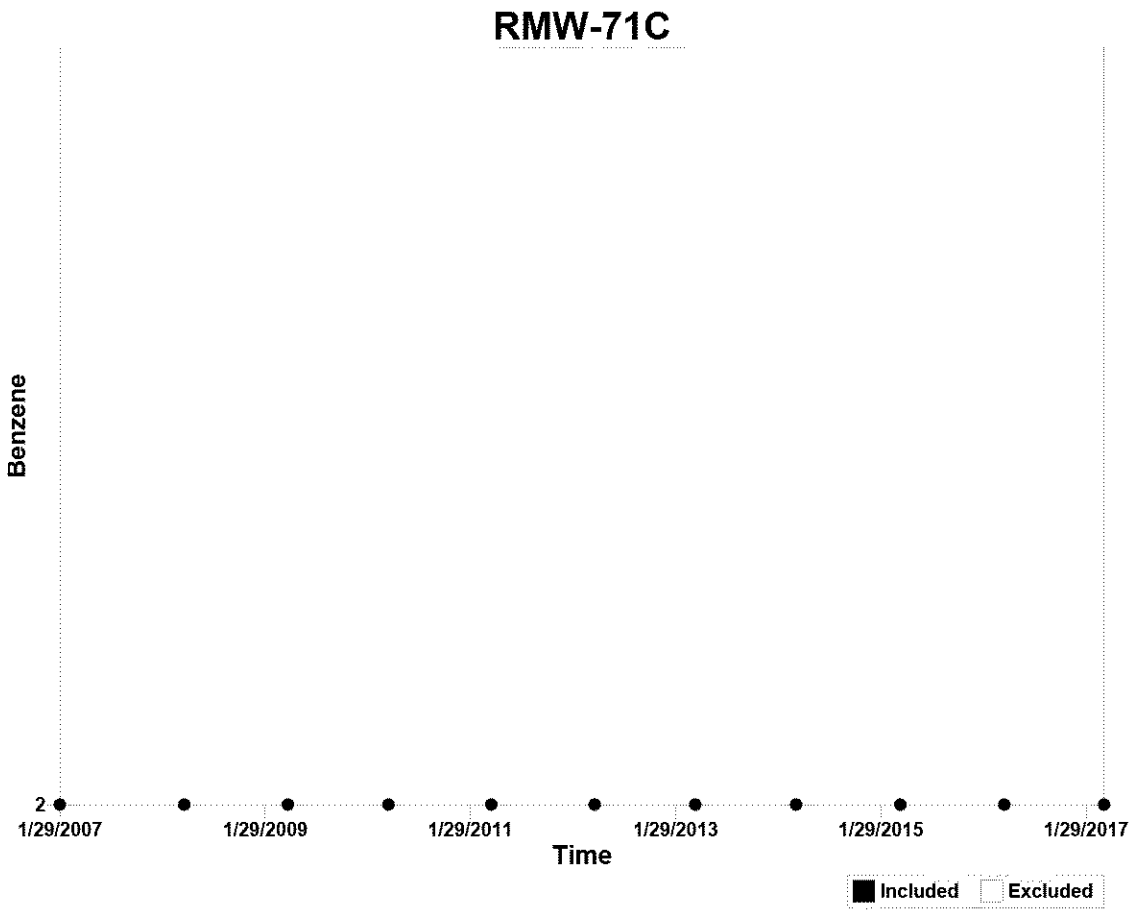
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

RMW-71B



RMW-71B							
Time	Value		Time	Value		Time	Value
10/18/2006	2		4/13/2010	2		4/3/2014	2
1/29/2007	2		4/14/2011	2		4/9/2015	2
4/16/2008	2		4/16/2012	2		4/13/2016	2
4/20/2009	2		4/9/2013	2		4/3/2017	2

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



RMW-71C							
Time	Value		Time	Value		Time	Value
1/29/2007	2		4/14/2011	2		4/9/2015	2
4/16/2008	2		4/16/2012	2		4/13/2016	2
4/20/2009	2		4/9/2013	2		4/3/2017	2
4/13/2010	2		4/3/2014	2			

Iterative Thinning

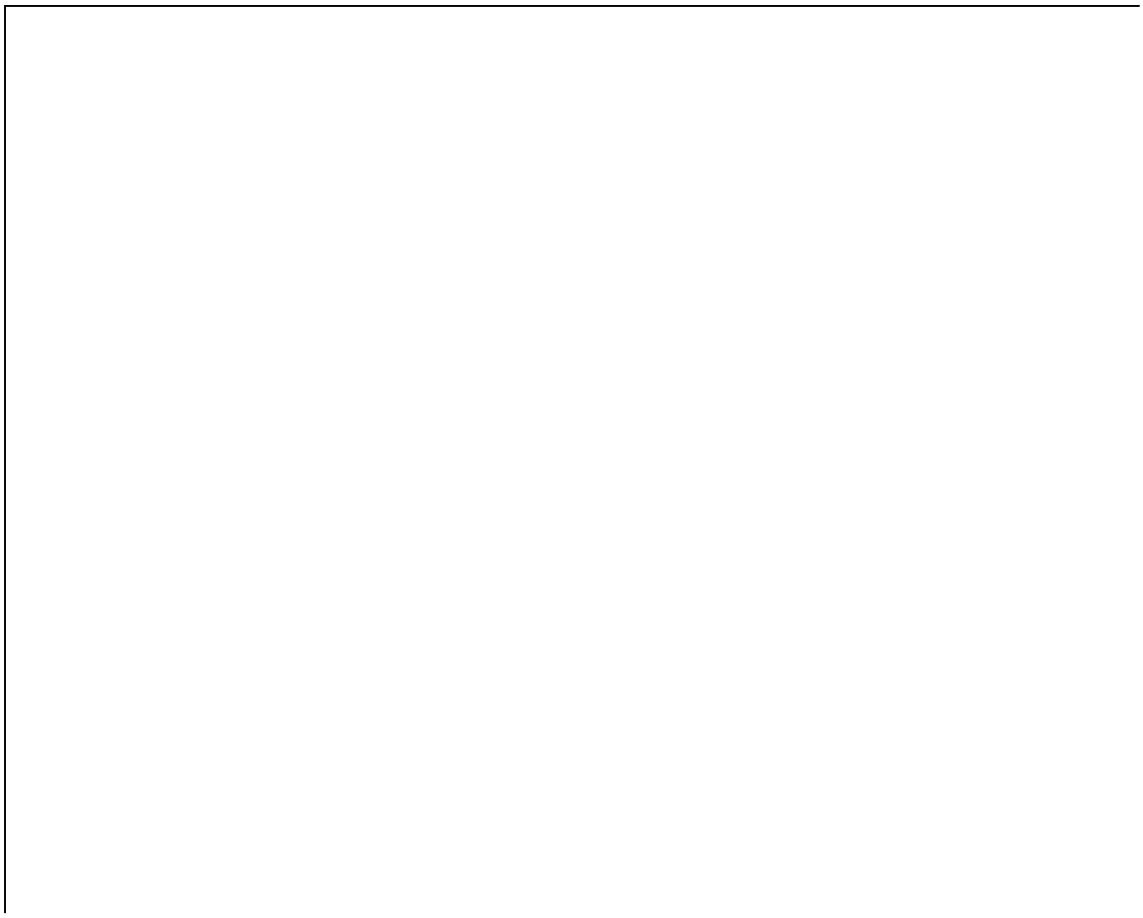
The iterative thinning approach is used to identify the frequency of sampling required to reproduce the temporal patterns of the full data set. The iterative thinning approach is based on an algorithm published by Cameron (2004). A percentage of the data points are removed from the data set and Lowess is used to fit a smooth curve to the reduced data set. The ability of the reduced data set to reproduce the temporal trends in the full data set is evaluated by calculating the percentage of the data points on the smooth fit for the reduced data set that fall within a specified confidence interval of the model fit established using the full data set. Increasing numbers of data points are removed from the data set and each of the reduced data sets is evaluated for their ability to reproduce the trend observed in the full data set.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location GB-01	
Original median interval between samples	355 days
Reduced sampling interval	177 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

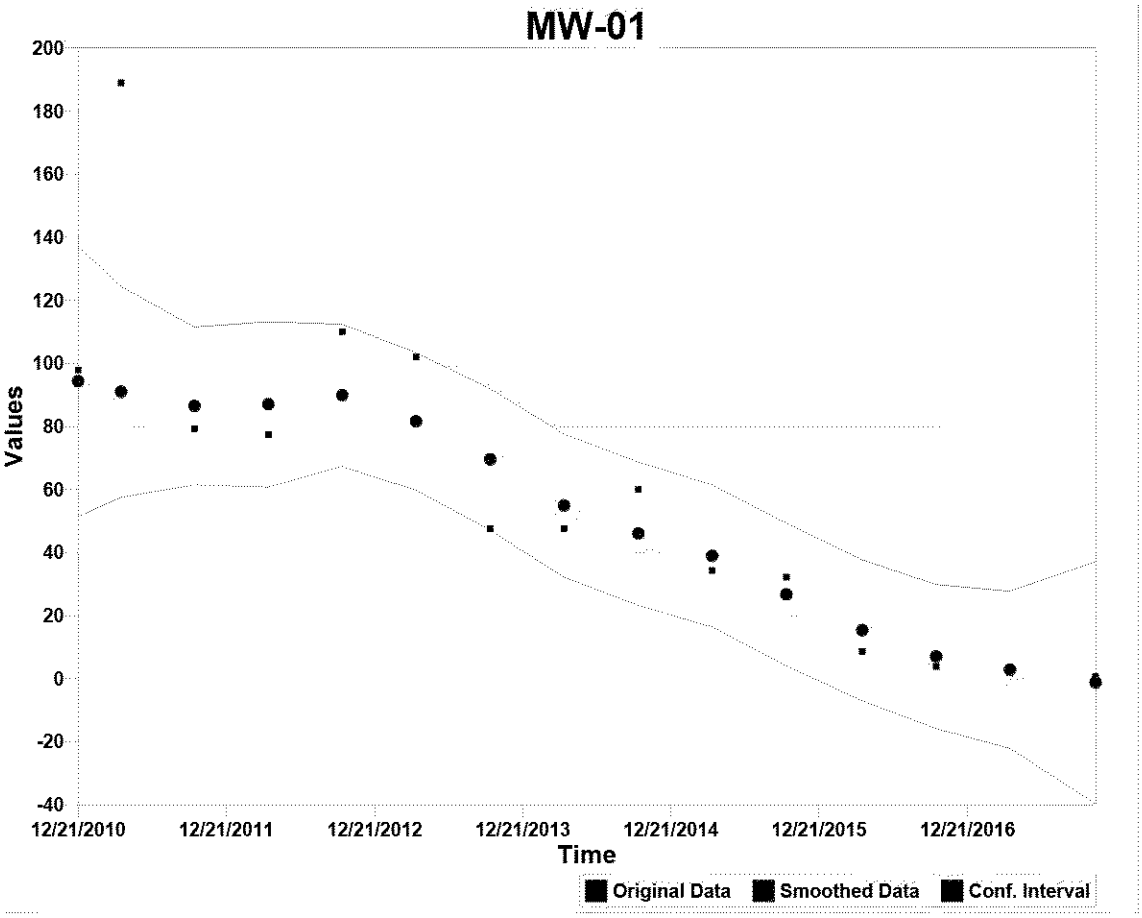
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location GB-06	
Original median interval between samples	354 days
Reduced sampling interval	177 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

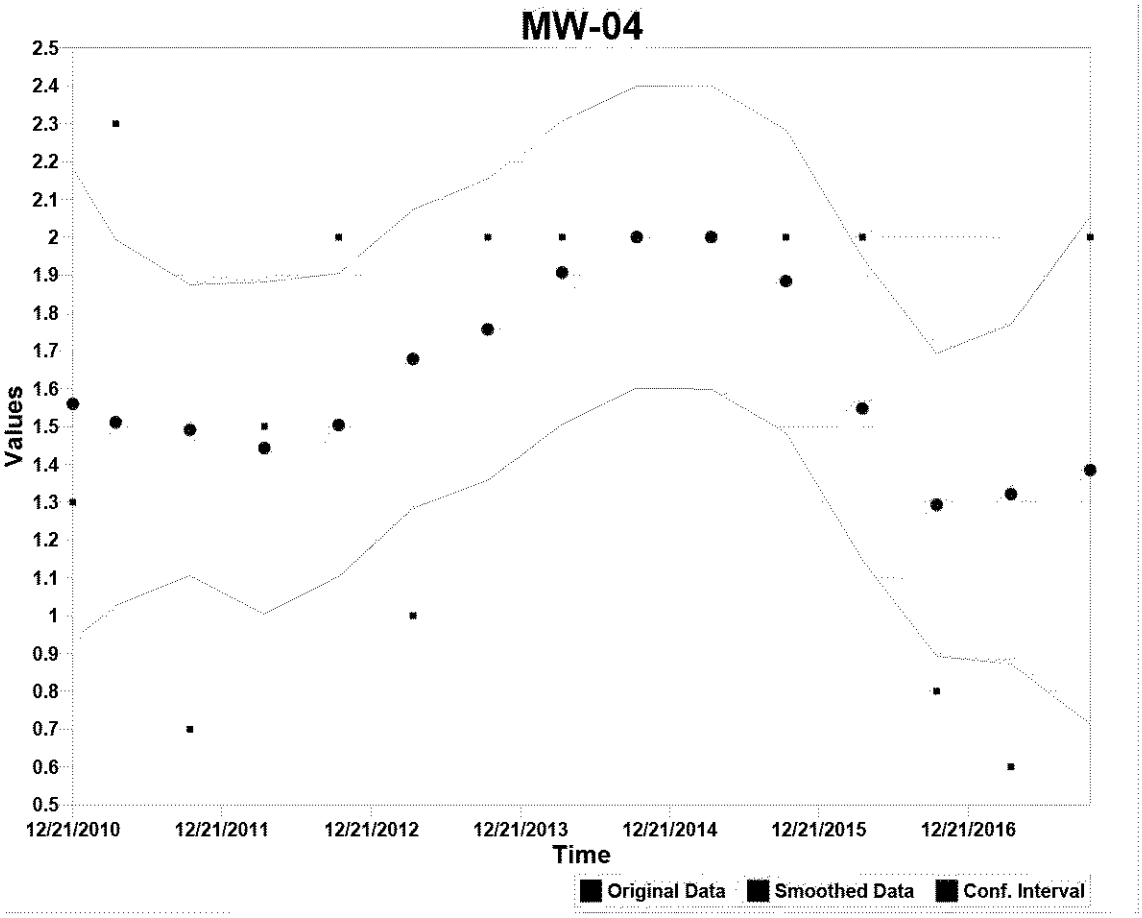
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location MW-01	
Original median interval between samples	182 days
Reduced sampling interval	330 days[a]
Percent reduction in sampling frequency	45%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

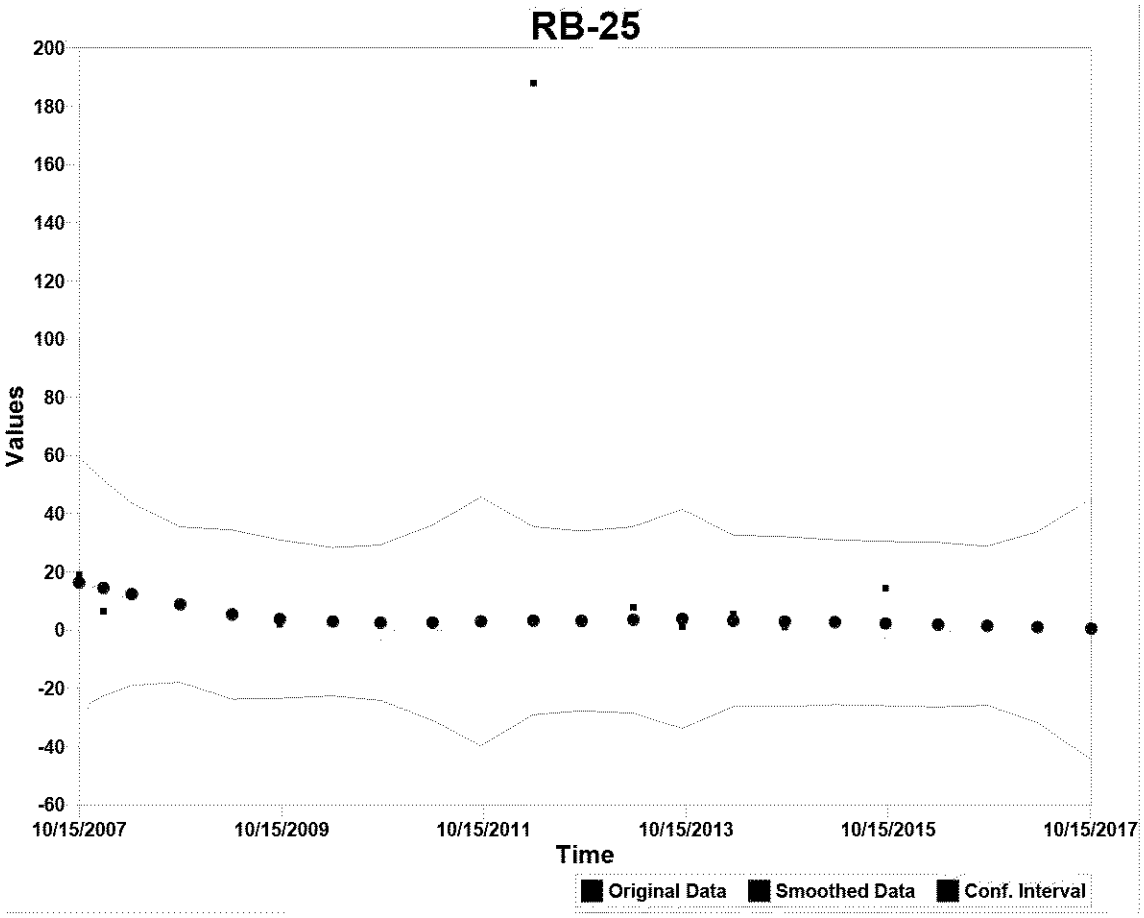
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location MW-04	
Original median interval between samples	182 days
Reduced sampling interval	280 days
Percent reduction in sampling frequency	35%
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

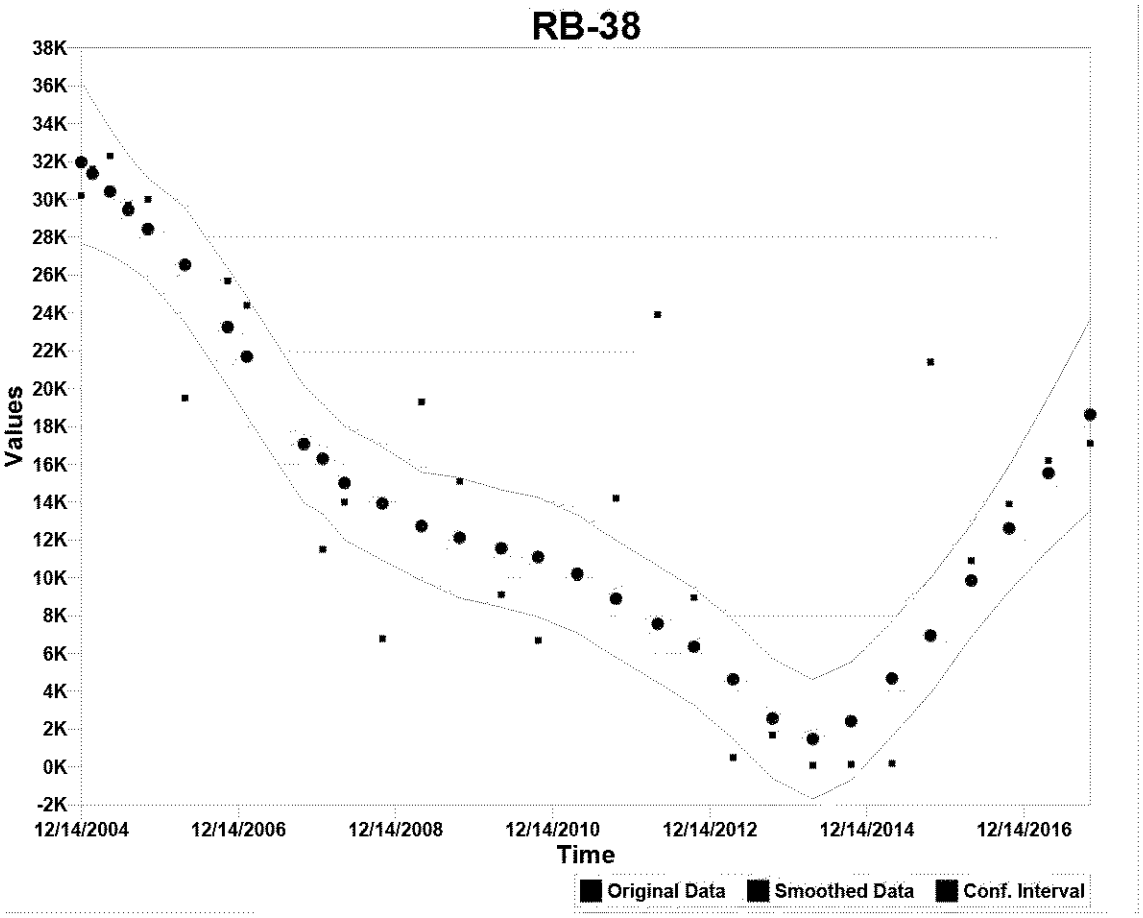
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-25	
Original median interval between samples	182 days
Reduced sampling interval	330 days[a]
Percent reduction in sampling frequency	45%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

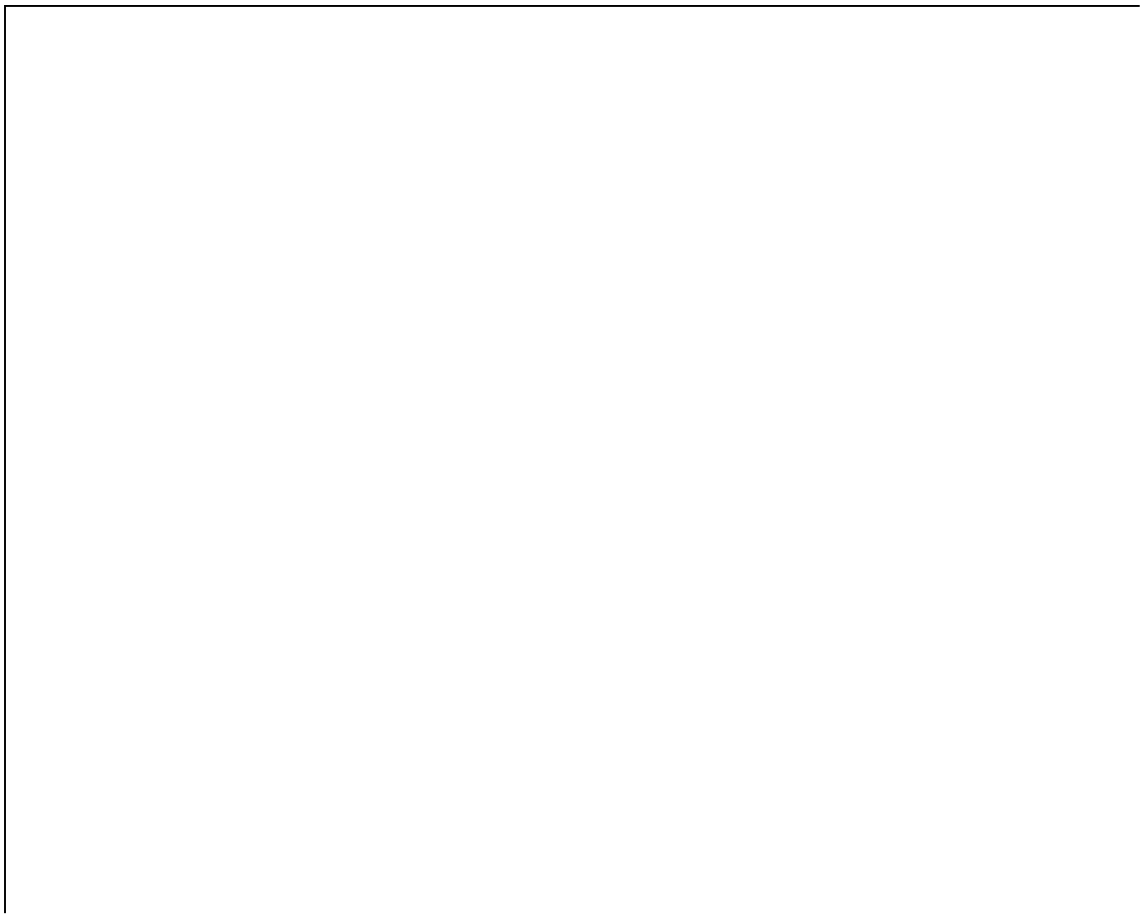
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-38	
Original median interval between samples	179 days
Reduced sampling interval	397 days
Percent reduction in sampling frequency	55%
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

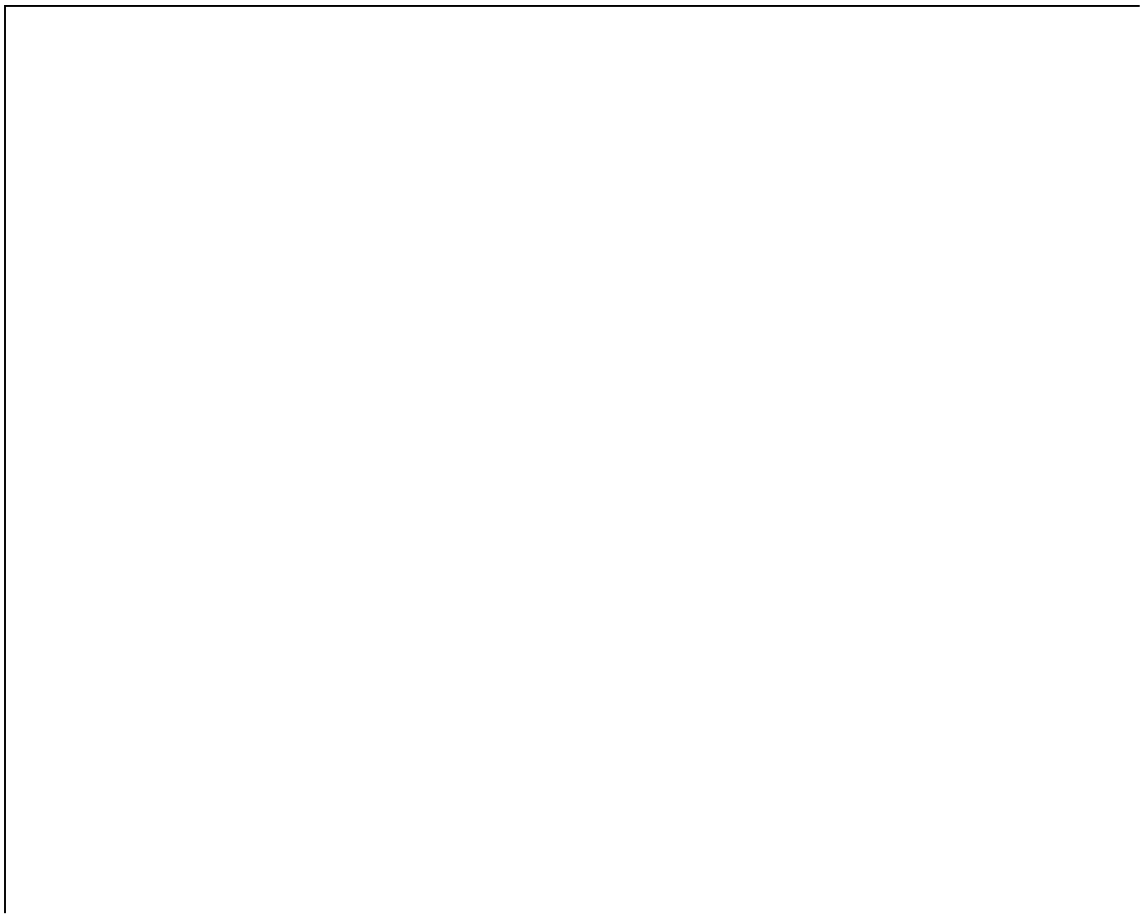
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-40	
Original median interval between samples	177 days
Reduced sampling interval	88 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-41	
Original median interval between samples	178 days
Reduced sampling interval	89 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

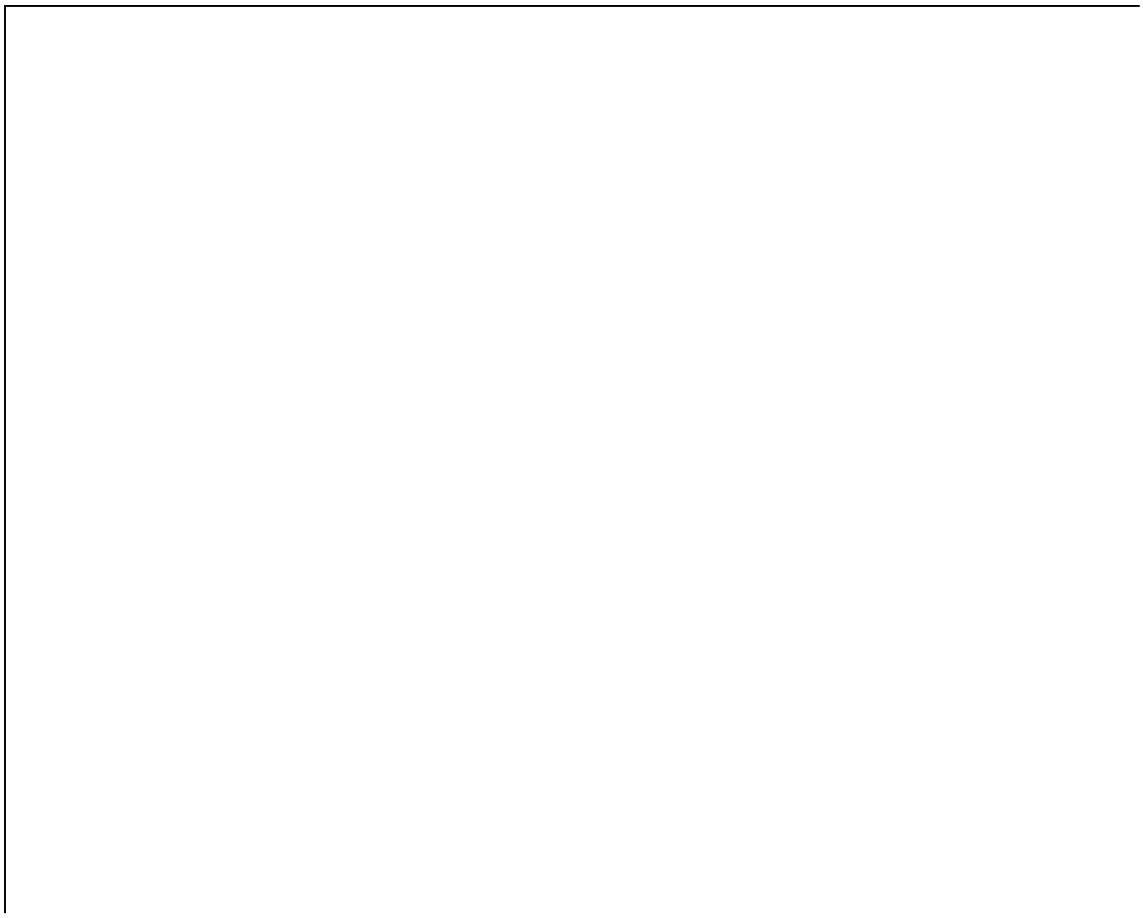
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RB-42	
Original median interval between samples	180 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

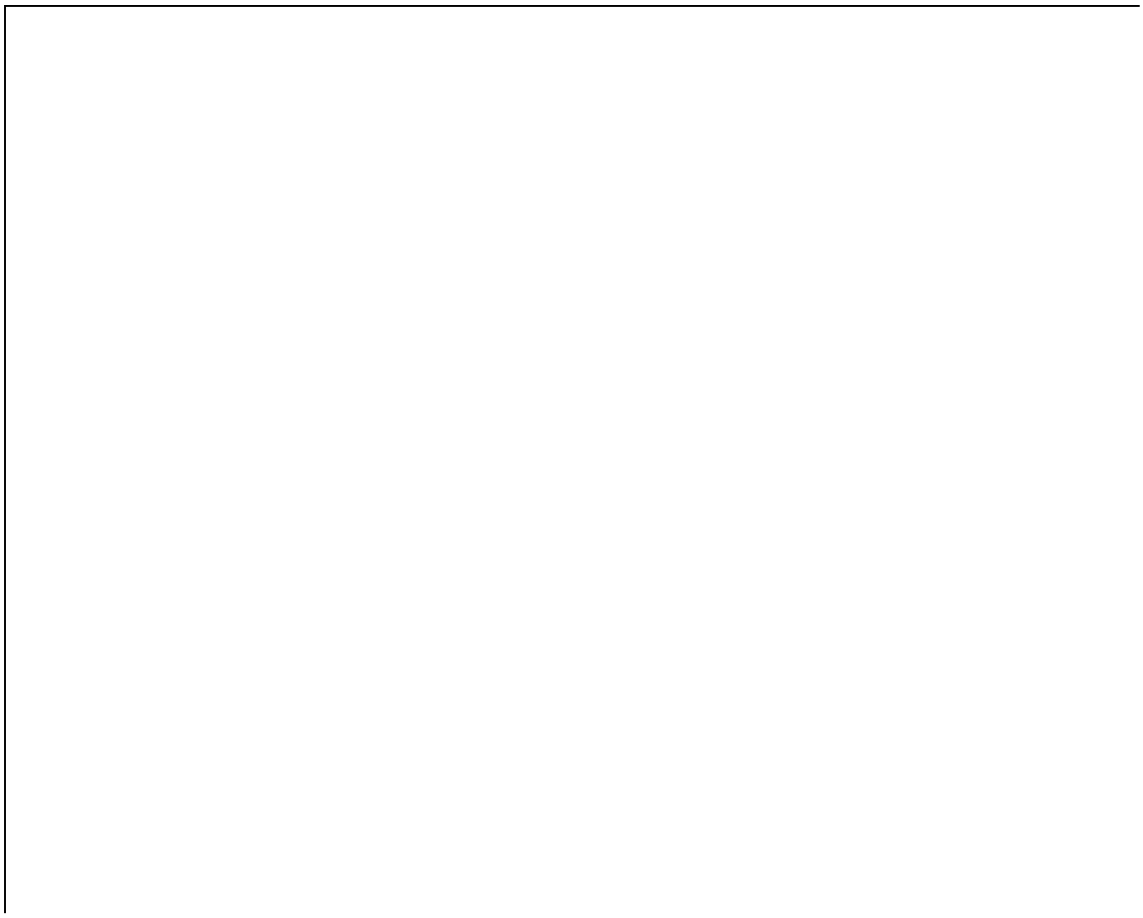
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-43	
Original median interval between samples	354 days
Reduced sampling interval	177 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

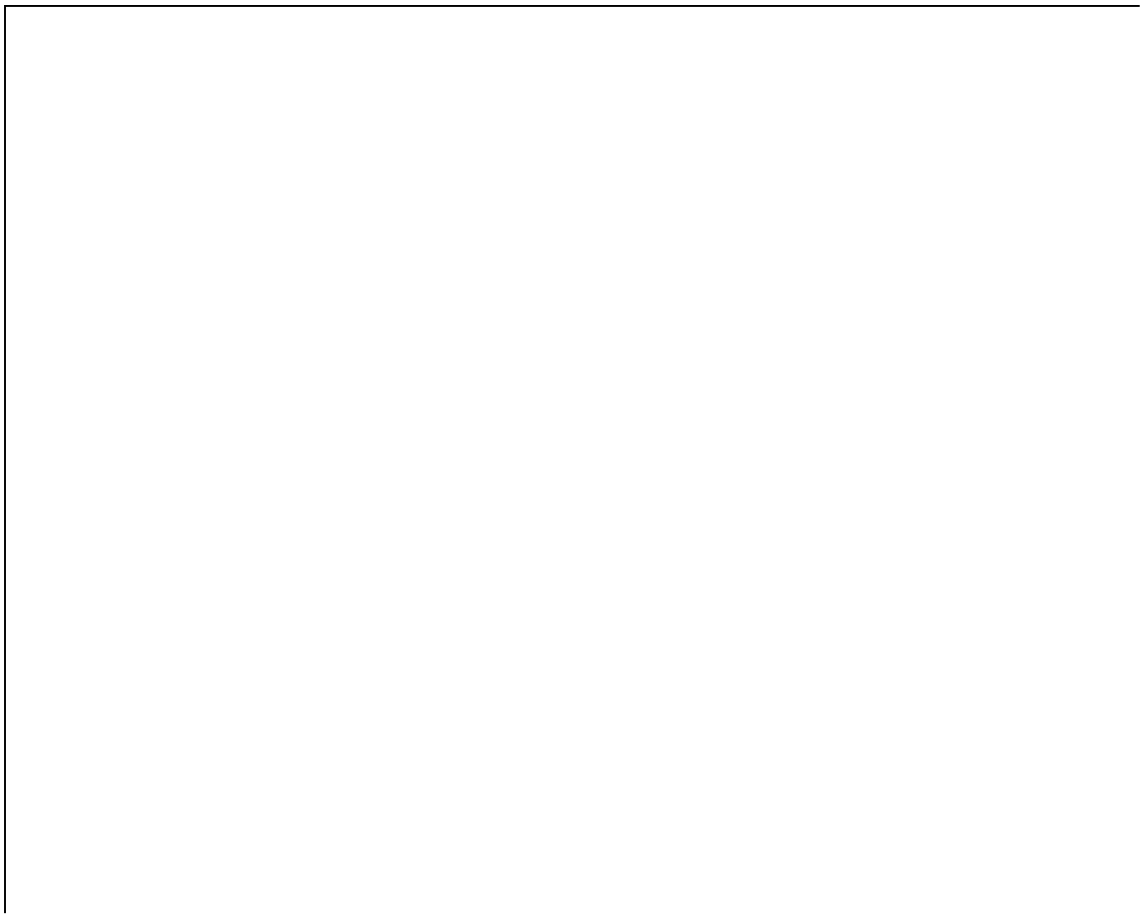
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-44	
Original median interval between samples	354 days
Reduced sampling interval	177 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

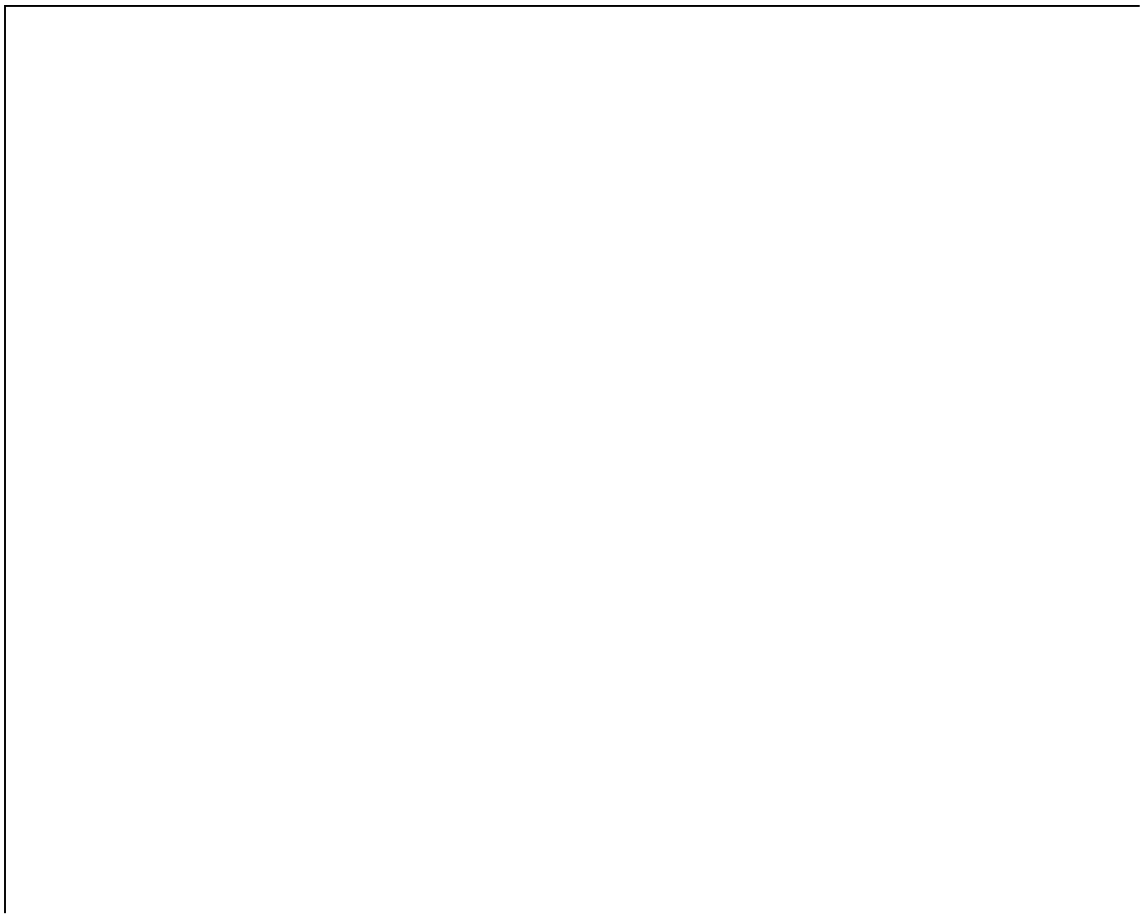
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-45	
Original median interval between samples	352 days
Reduced sampling interval	176 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

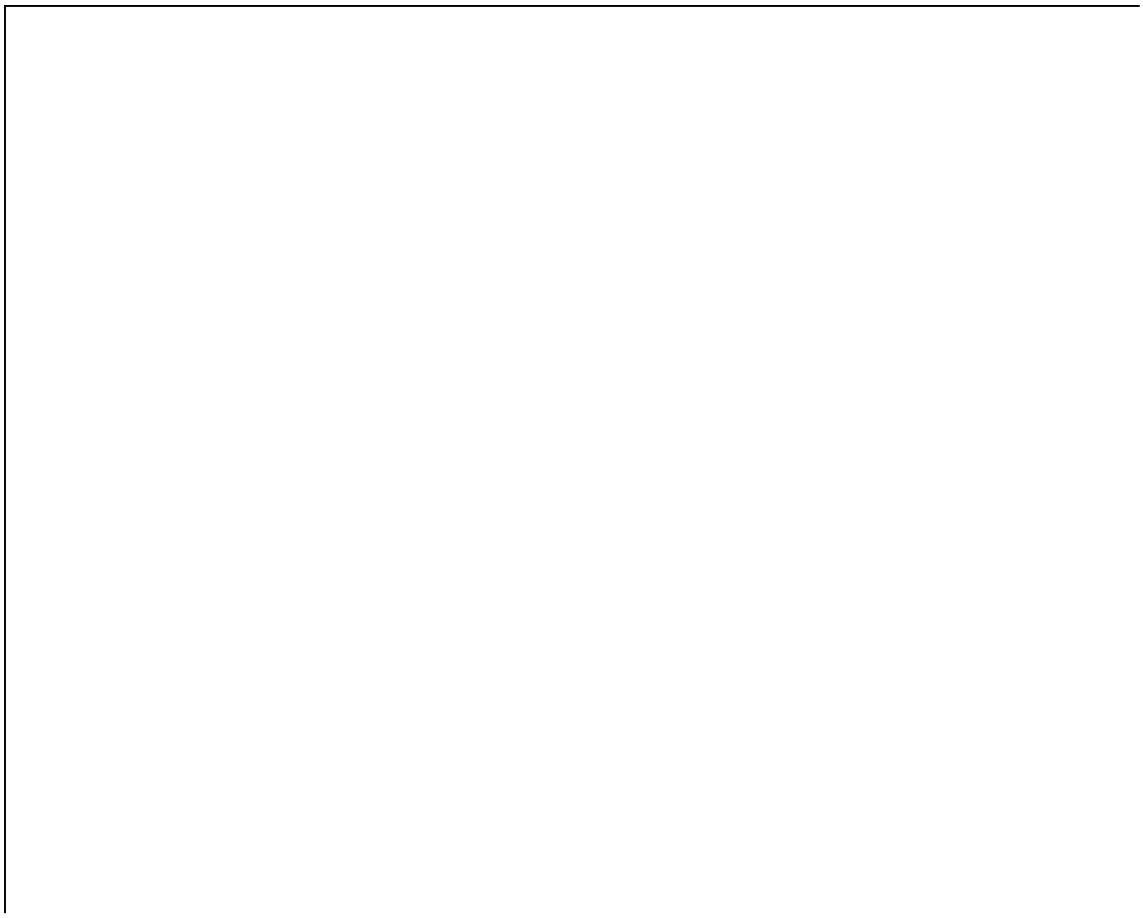
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-46	
Original median interval between samples	357 days
Reduced sampling interval	178 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

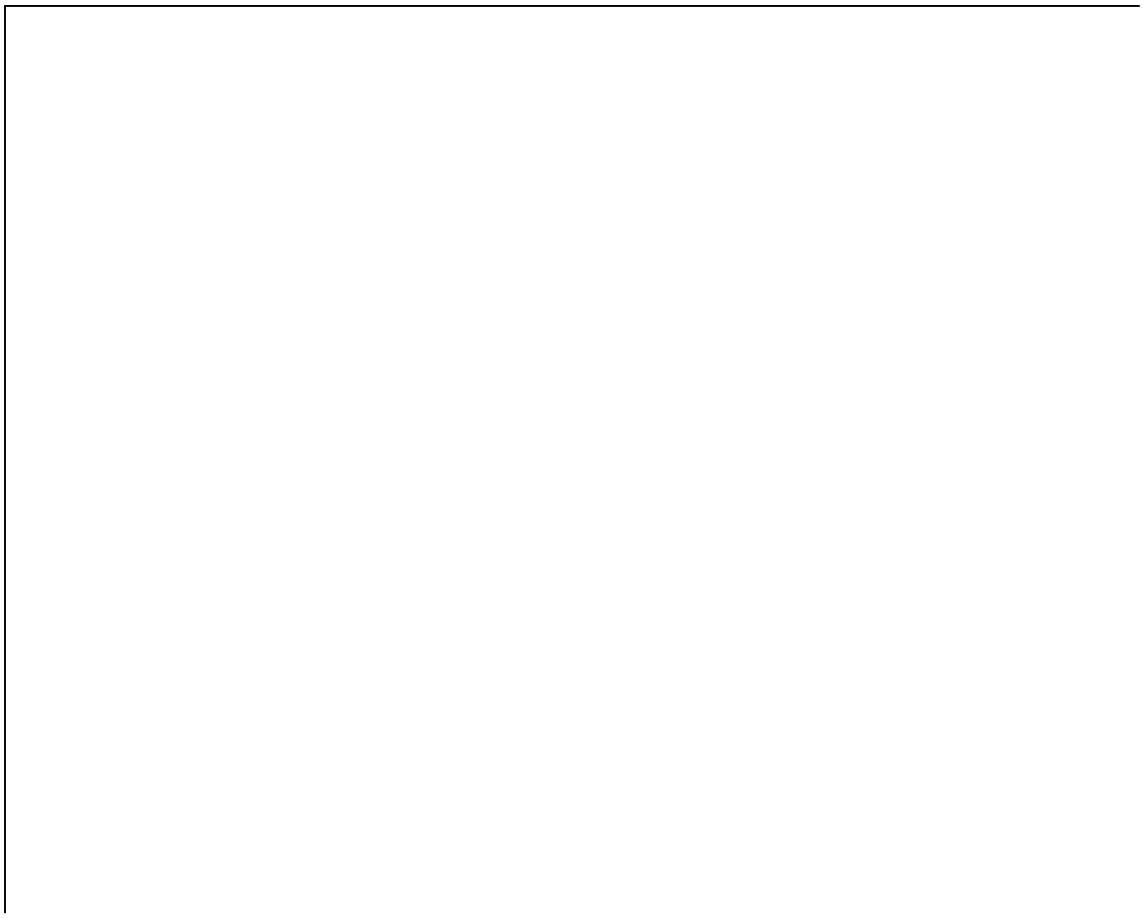
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-49	
Original median interval between samples	358 days
Reduced sampling interval	179 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

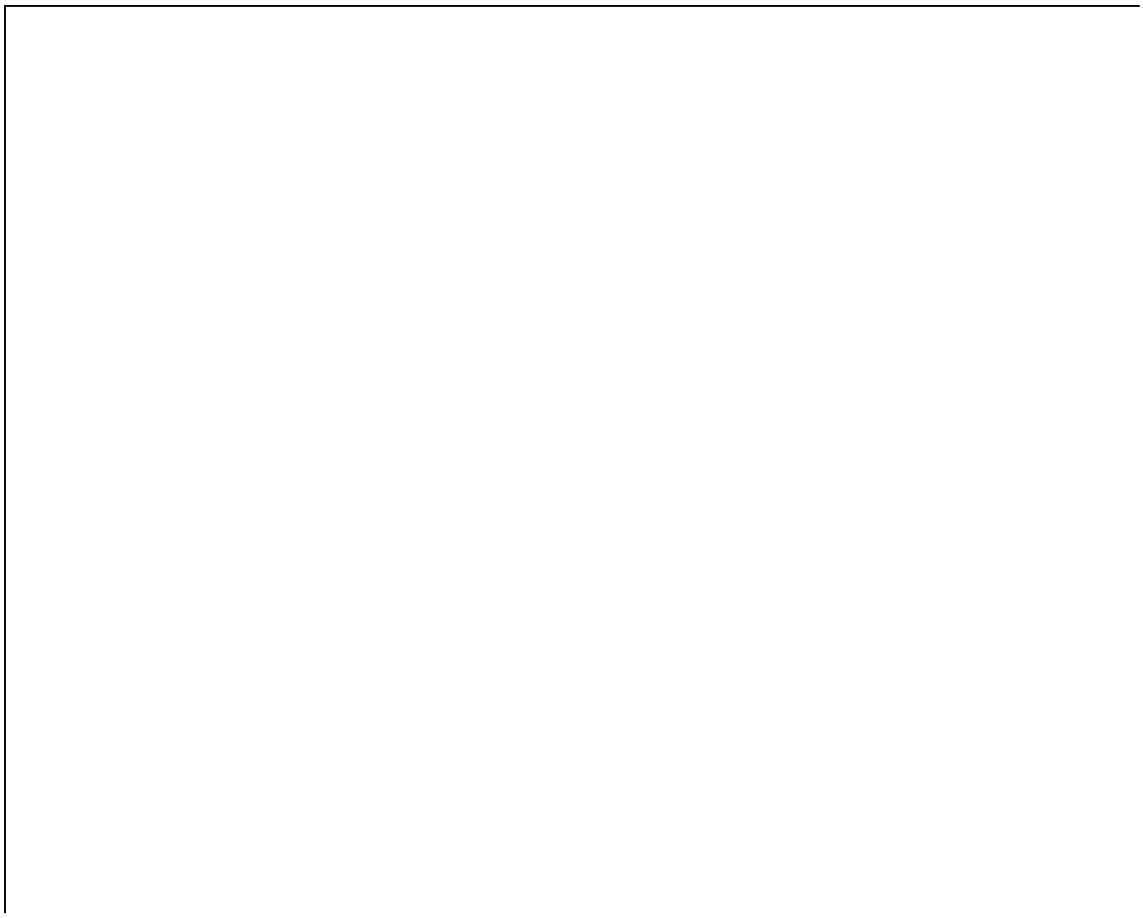
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-50	
Original median interval between samples	364 days
Reduced sampling interval	182 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RB-51	
Original median interval between samples	181 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

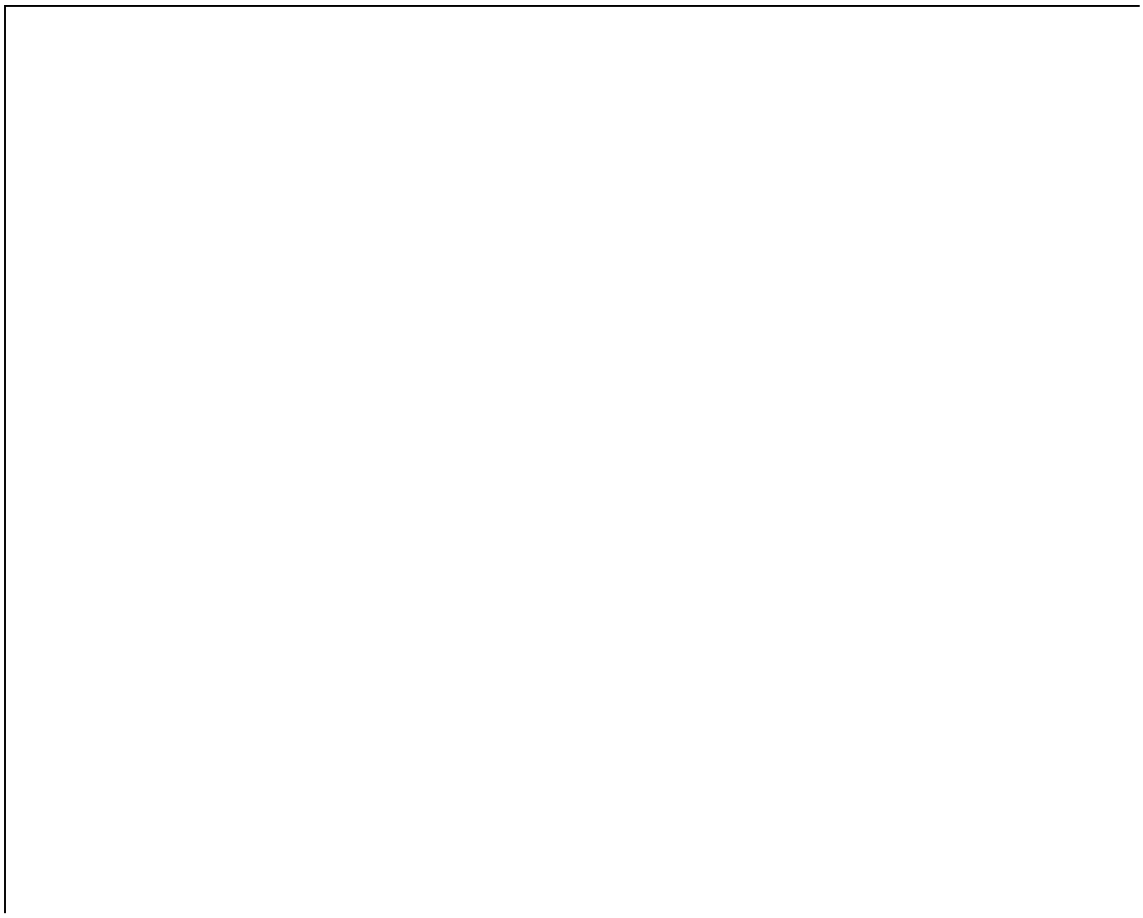
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-01D	
Original median interval between samples	179 days
Reduced sampling interval	89 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

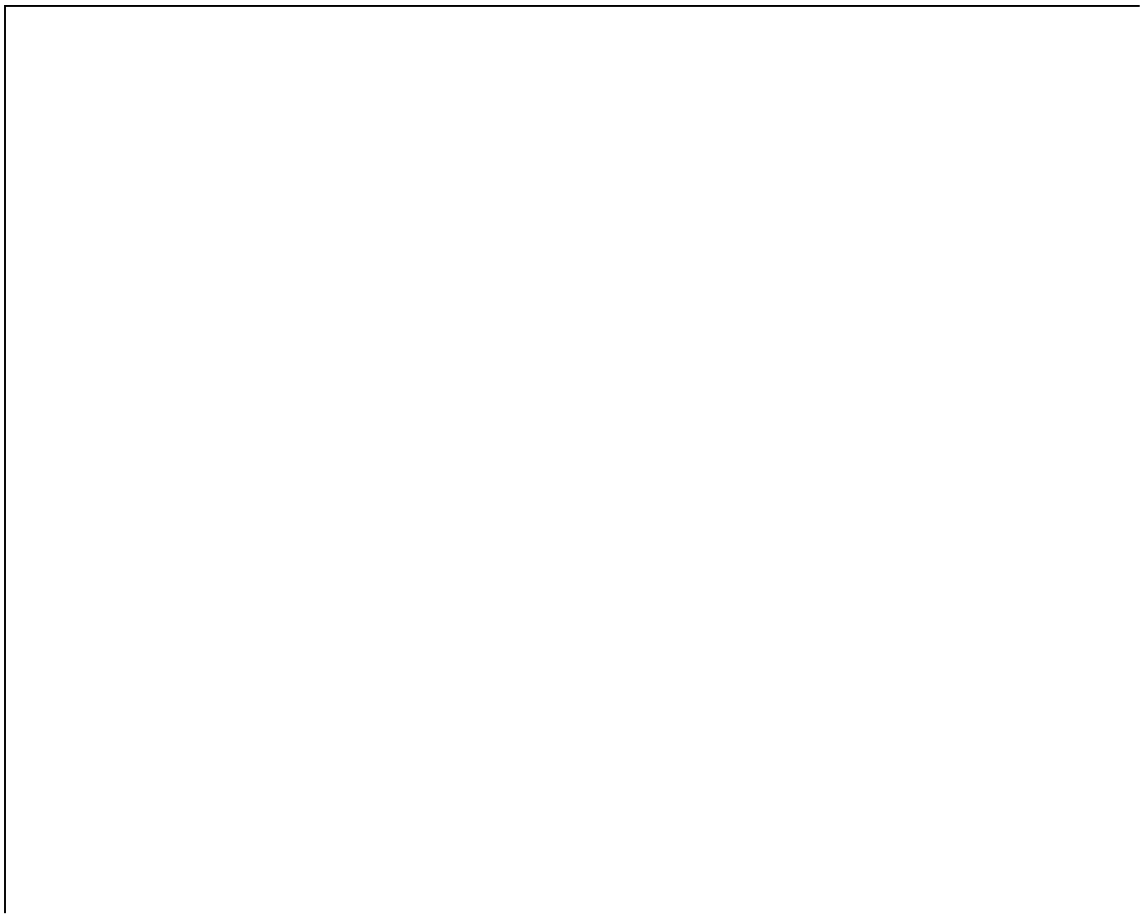
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-01E	
Original median interval between samples	179 days
Reduced sampling interval	89 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

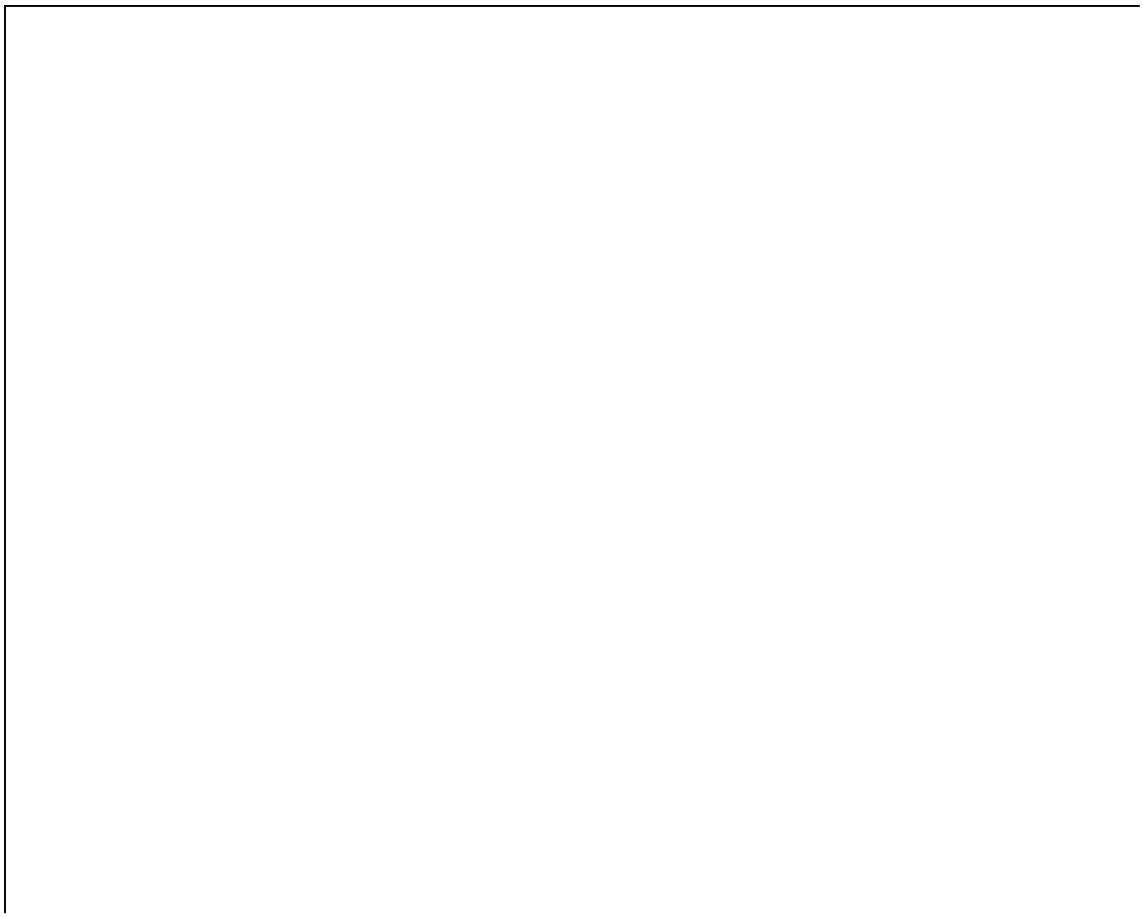
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-01F	
Original median interval between samples	179 days
Reduced sampling interval	89 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-02D	
Original median interval between samples	181 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-02E	
Original median interval between samples	181 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

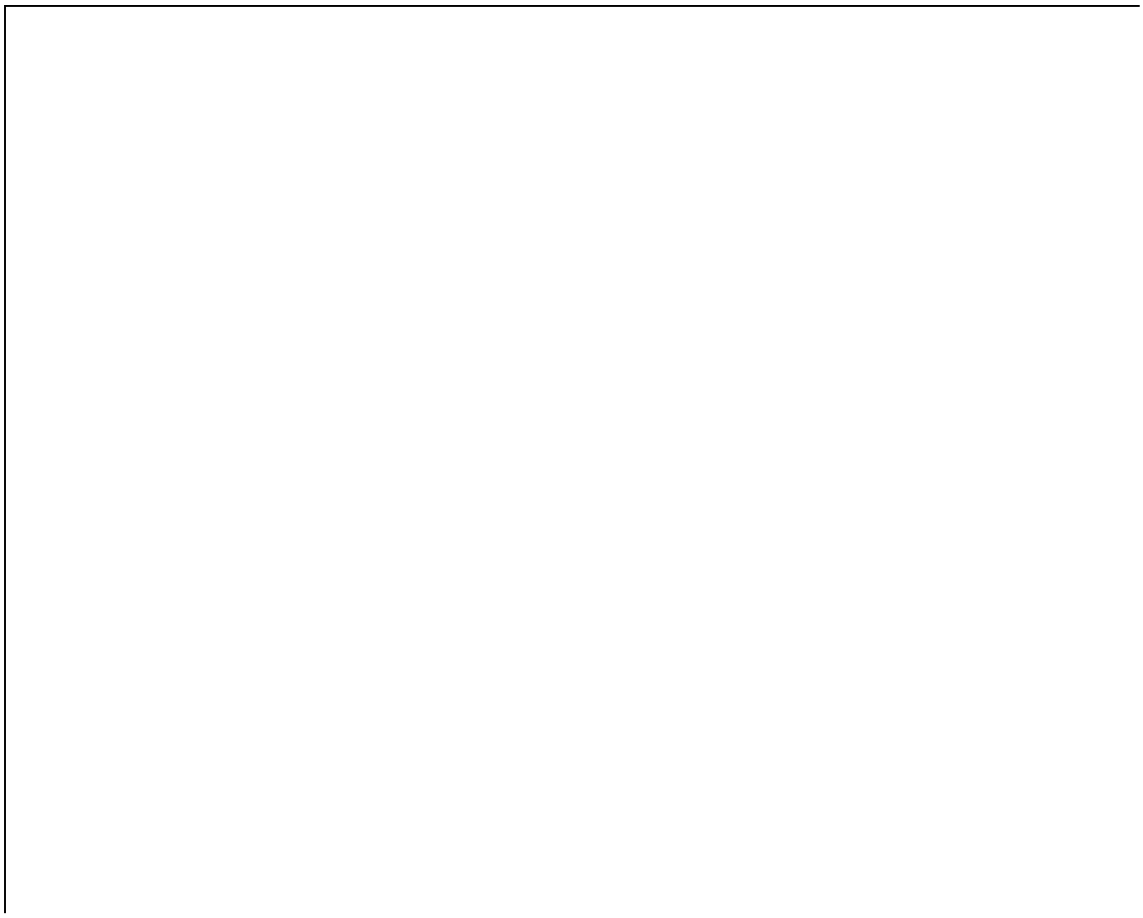
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-02F	
Original median interval between samples	182 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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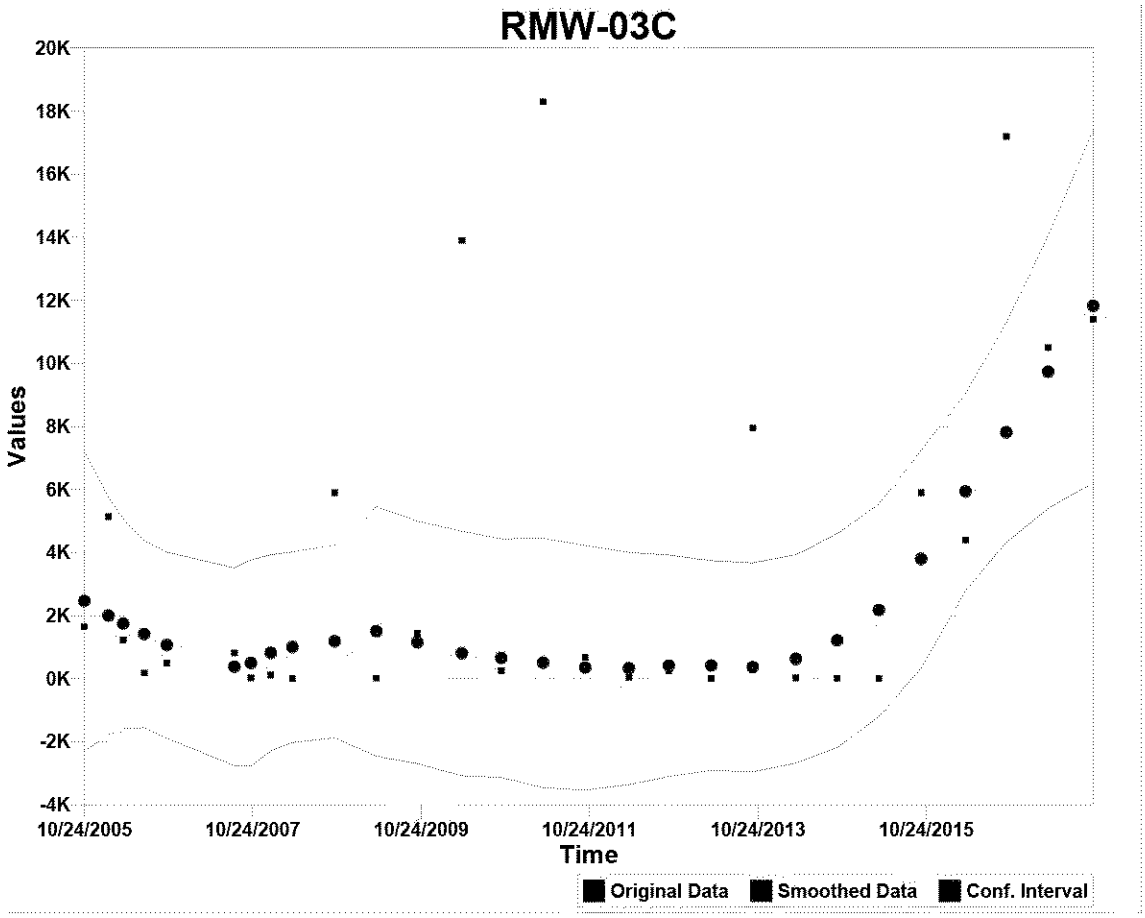
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-03A	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

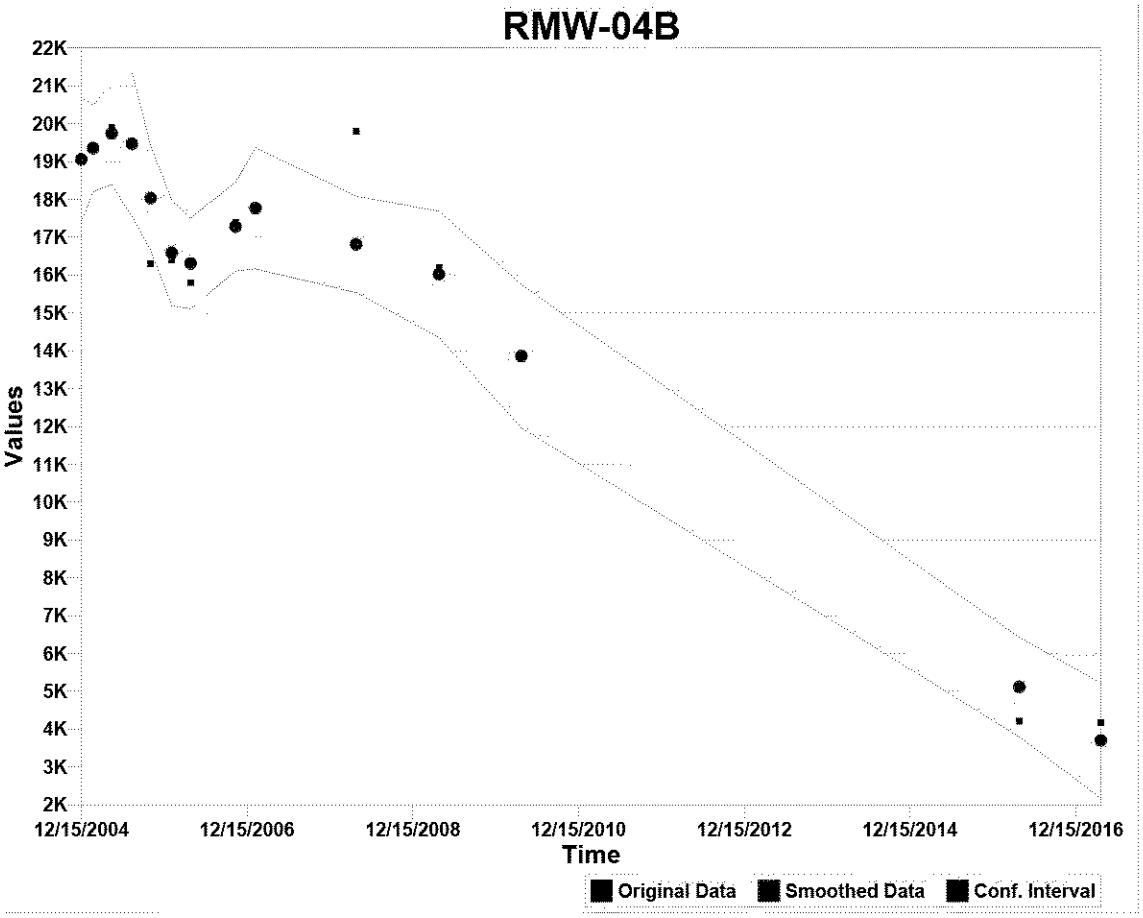
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-03C	
Original median interval between samples	181 days
Reduced sampling interval	517 days
Percent reduction in sampling frequency	65%
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

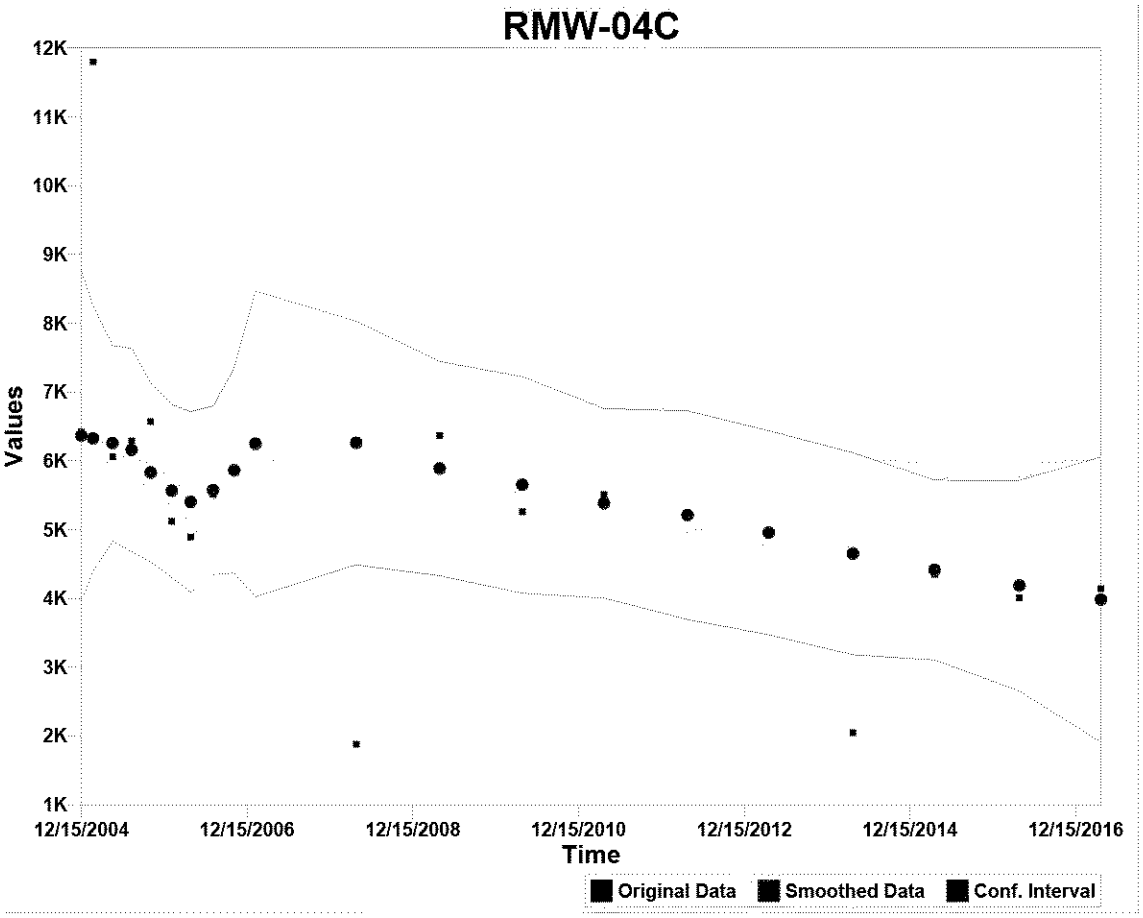
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-04B	
Original median interval between samples	93 days
Reduced sampling interval	155 days[a]
Percent reduction in sampling frequency	40%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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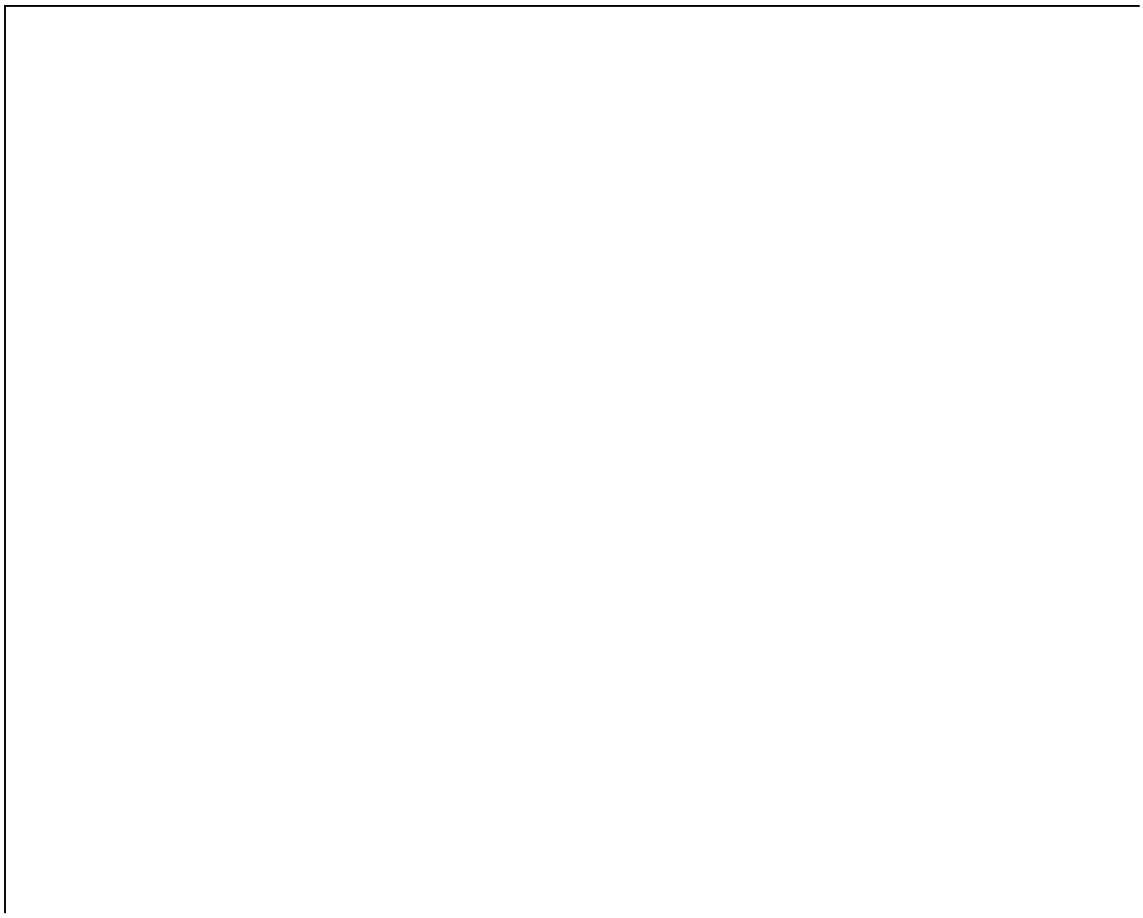
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-04C	
Original median interval between samples	358 days
Reduced sampling interval	795 days[a]
Percent reduction in sampling frequency	55%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-04D	
Original median interval between samples	359 days
Reduced sampling interval	179 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

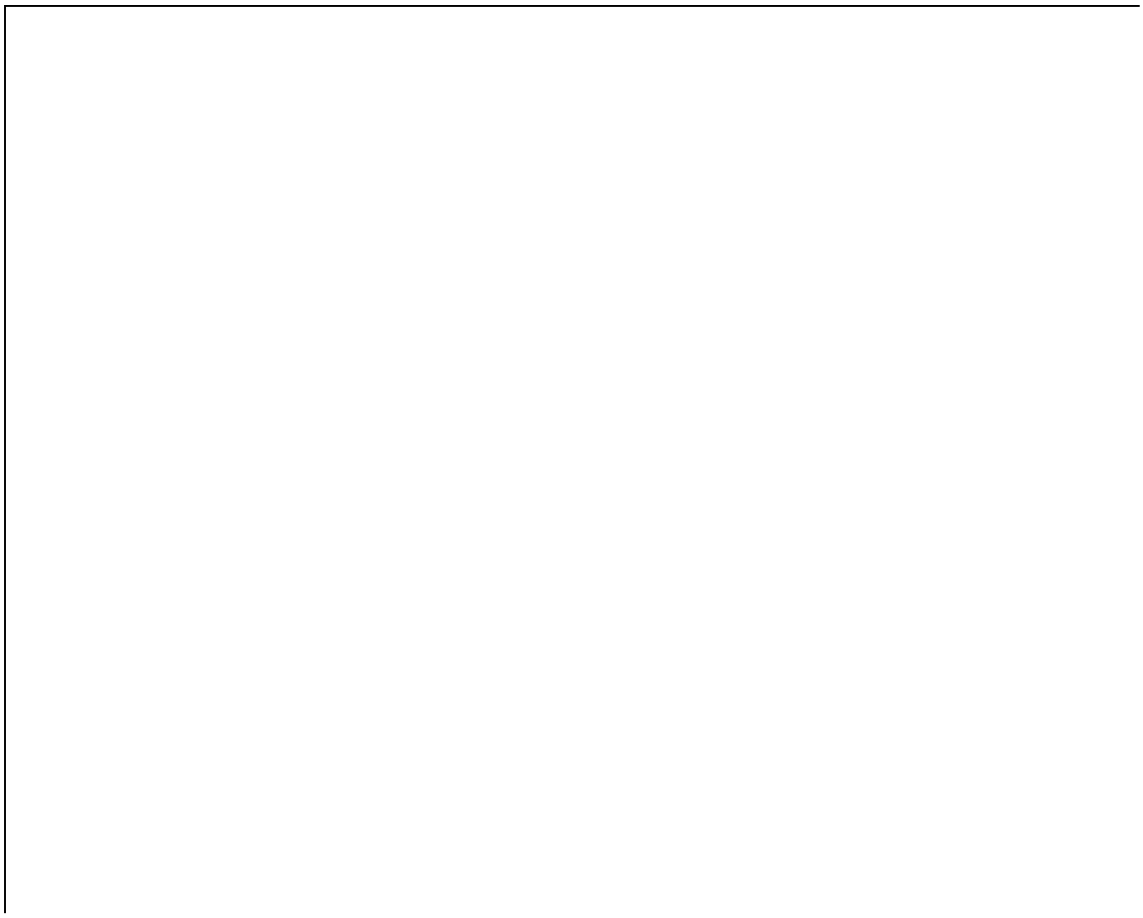
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-04E	
Original median interval between samples	359 days
Reduced sampling interval	179 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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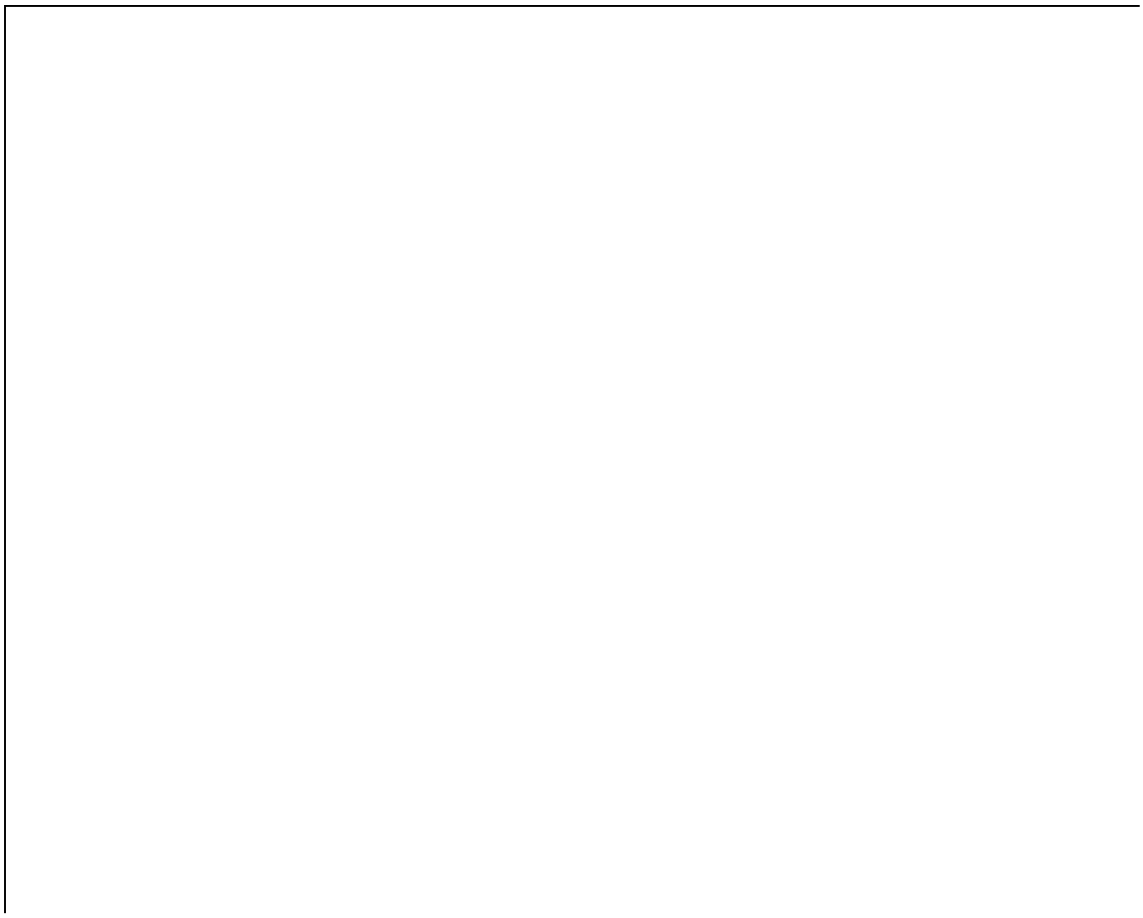
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-04F	
Original median interval between samples	362 days
Reduced sampling interval	181 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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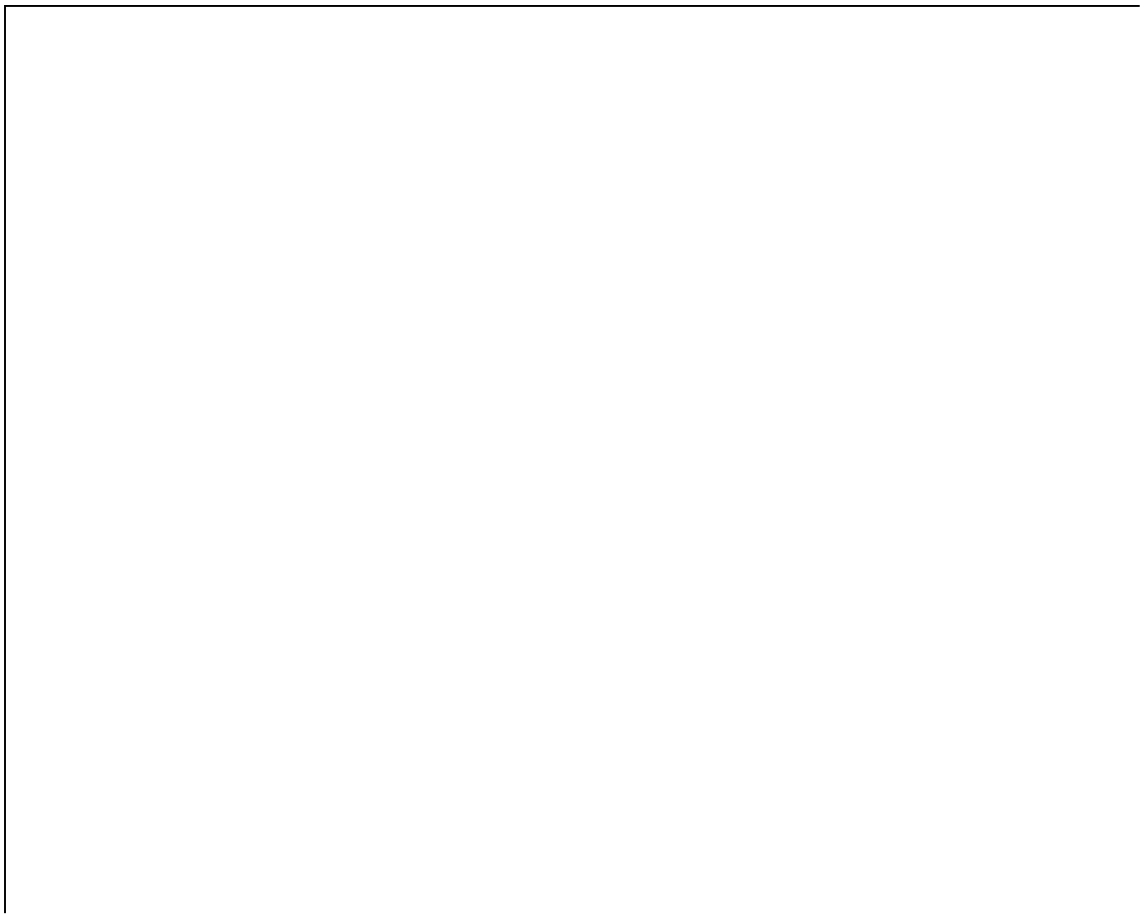
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-05A	
Original median interval between samples	184 days
Reduced sampling interval	92 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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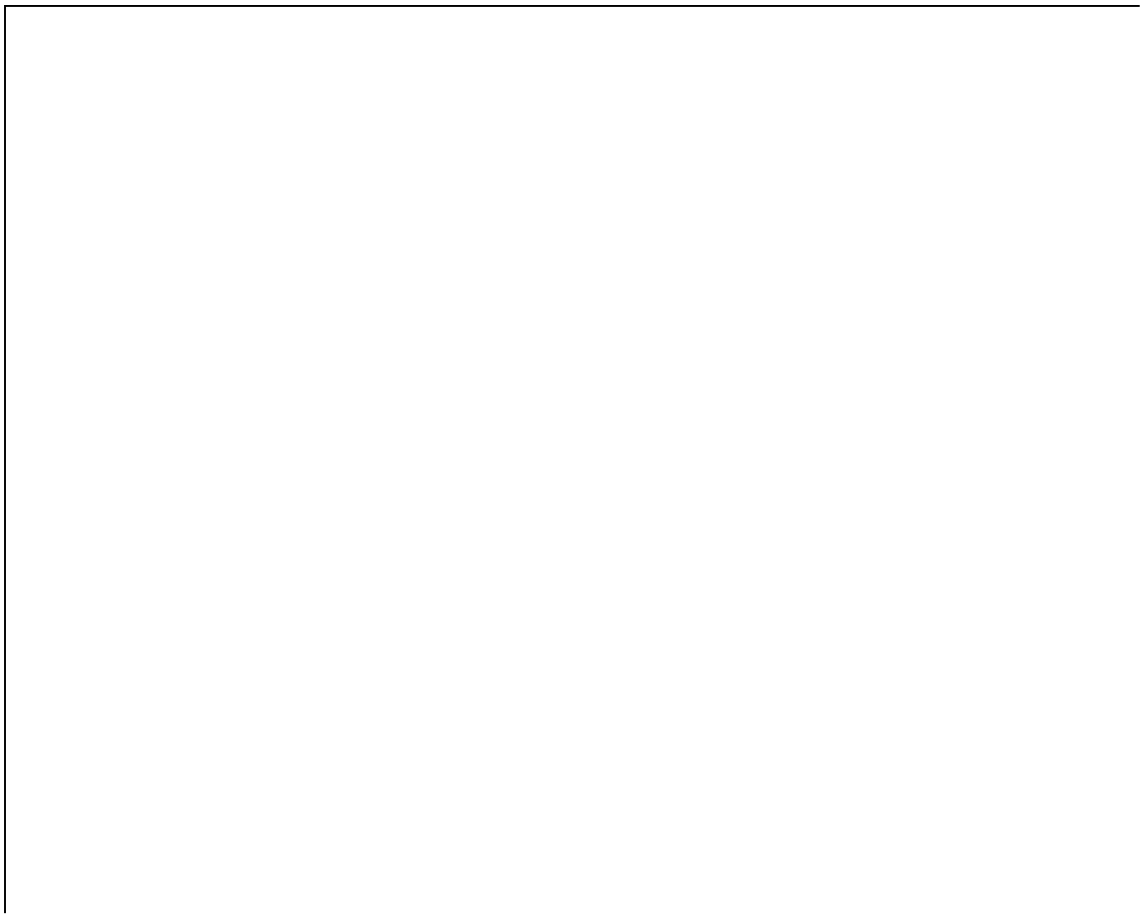
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-05B	
Original median interval between samples	179 days
Reduced sampling interval	89 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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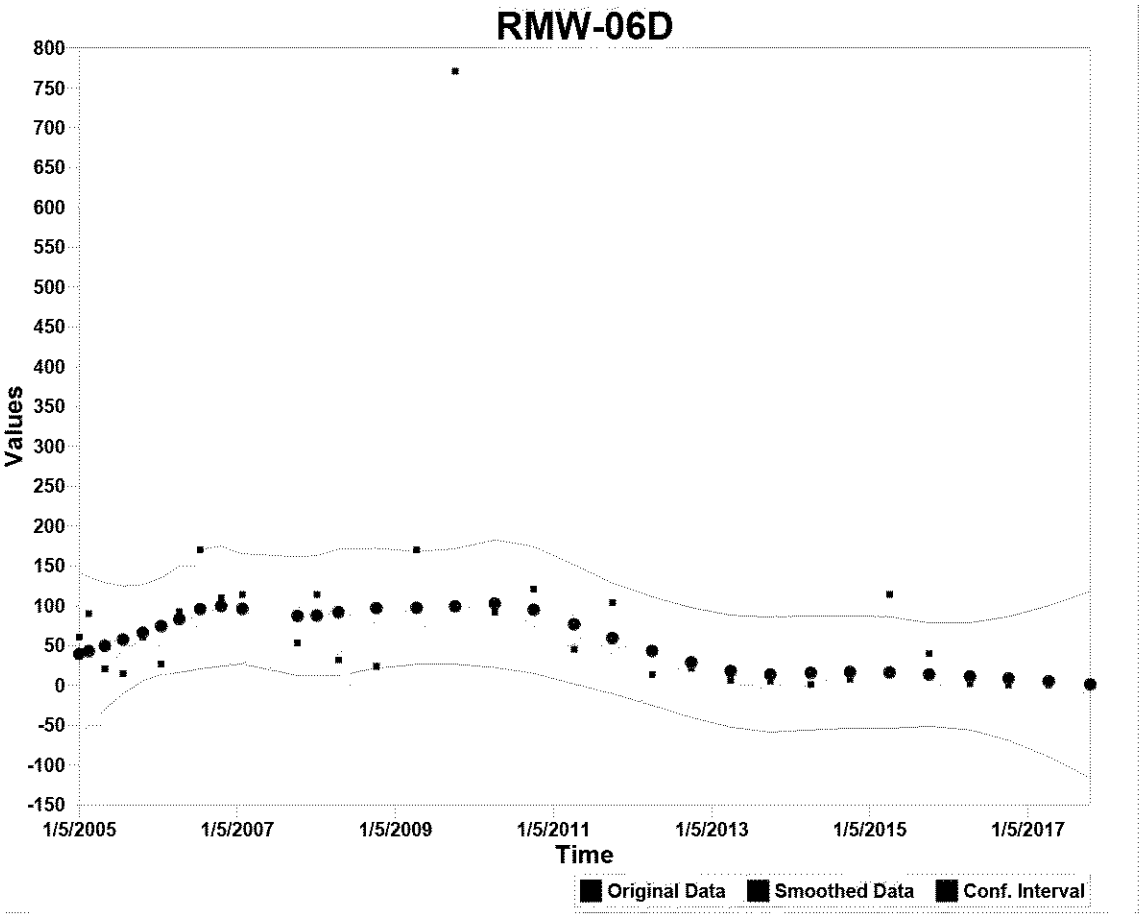
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-05C	
Original median interval between samples	181 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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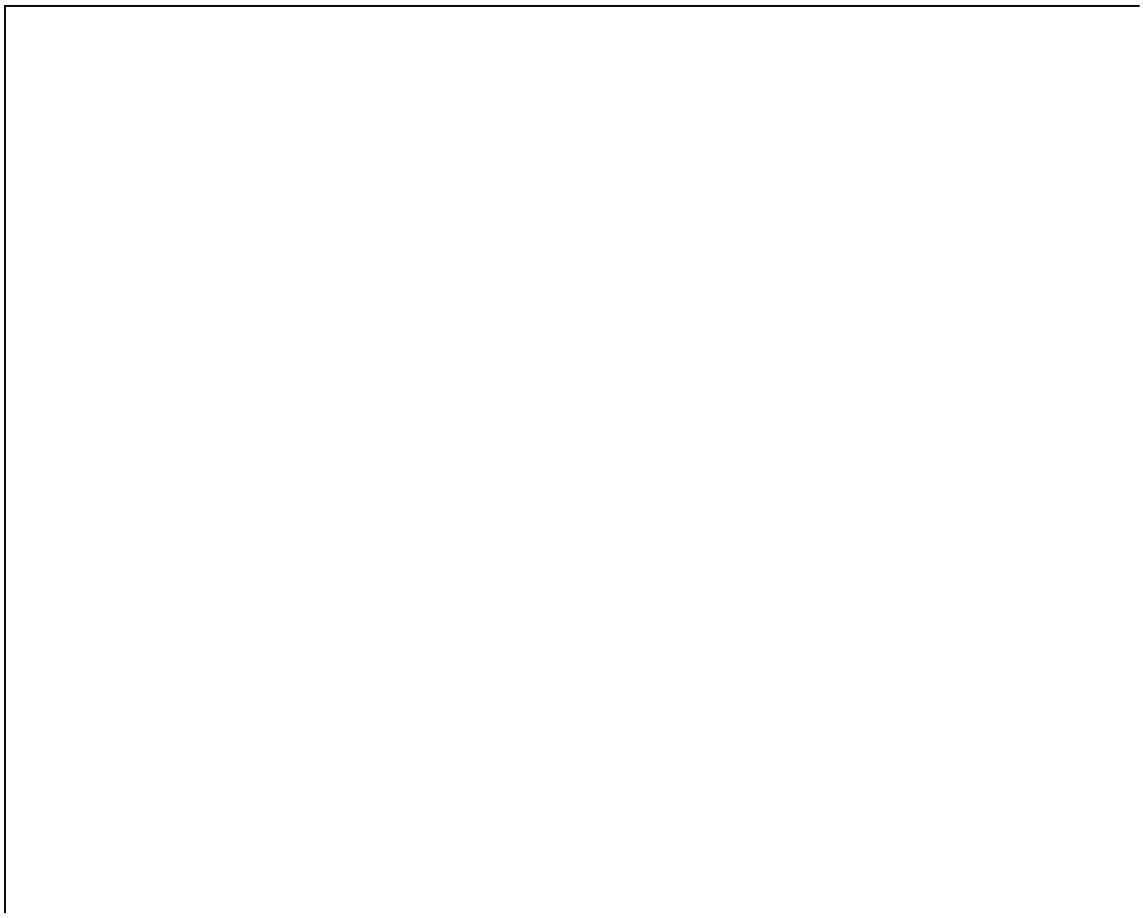
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-06D	
Original median interval between samples	180 days
Reduced sampling interval	600 days[a]
Percent reduction in sampling frequency	70%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

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interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-06E	
Original median interval between samples	181 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

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interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-06F	
Original median interval between samples	181 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

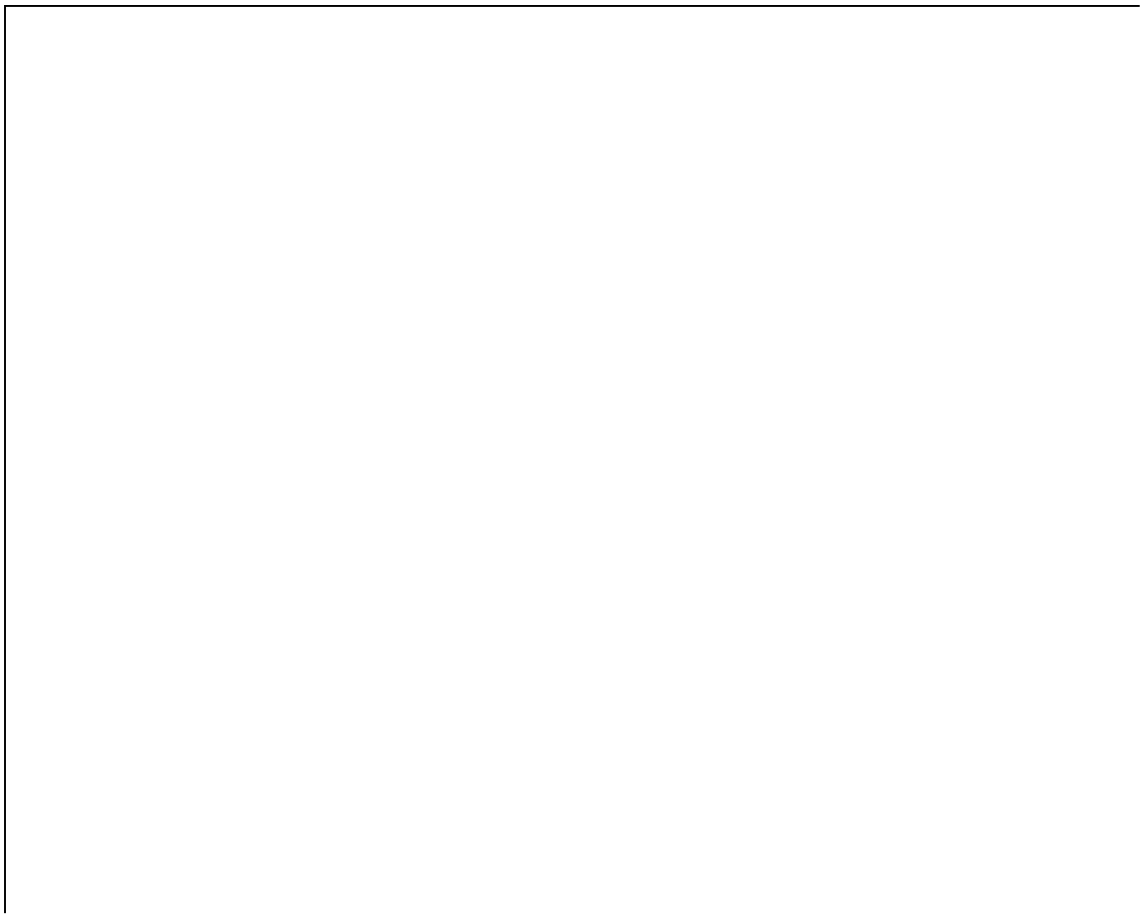
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interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-06G	
Original median interval between samples	181 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

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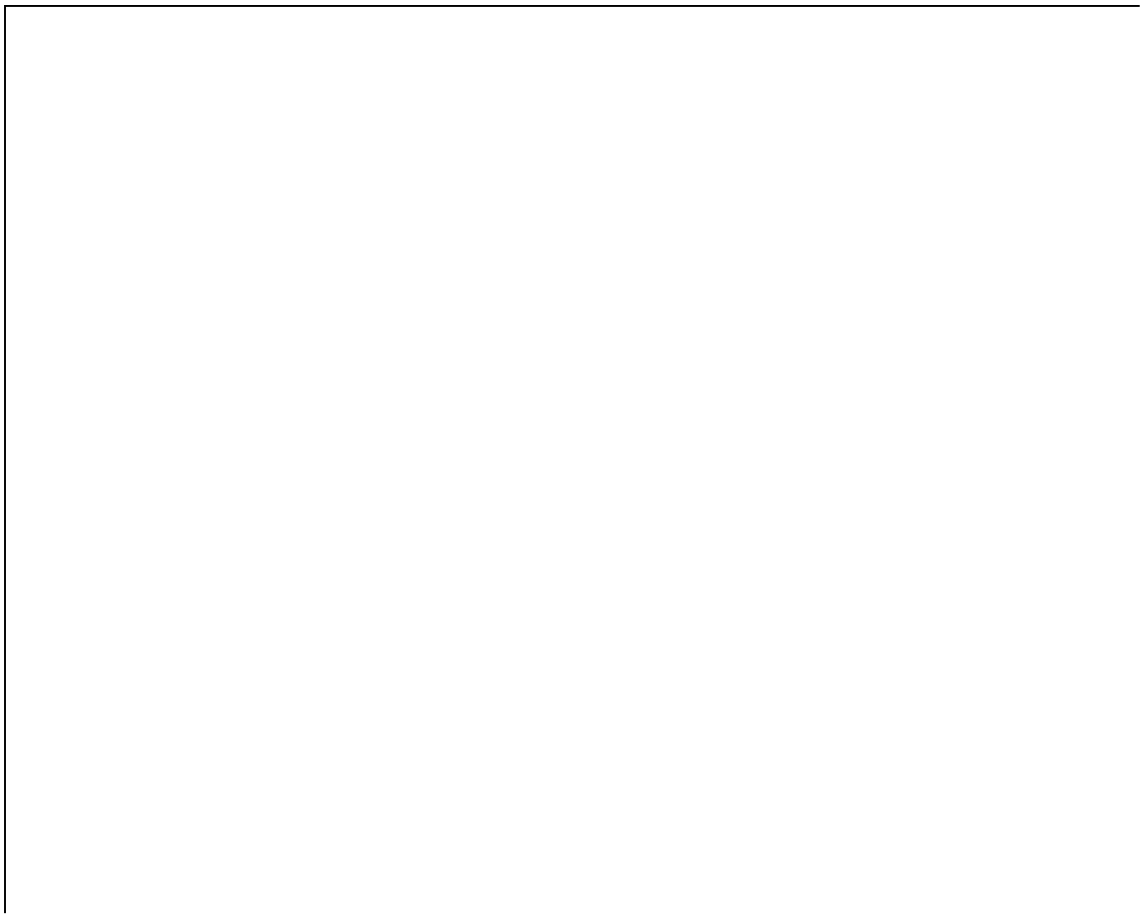
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-07A	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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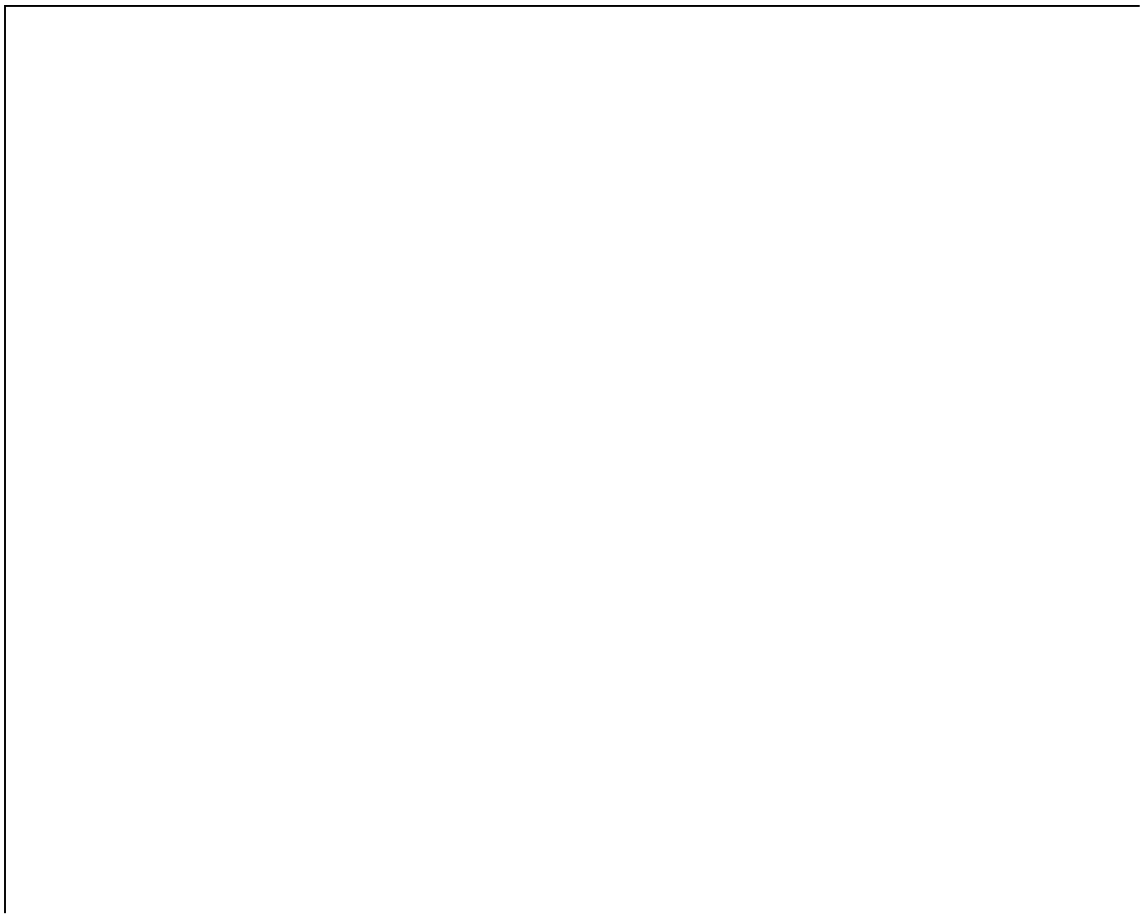
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-07D	
Original median interval between samples	184 days
Reduced sampling interval	92 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-07E	
Original median interval between samples	180 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

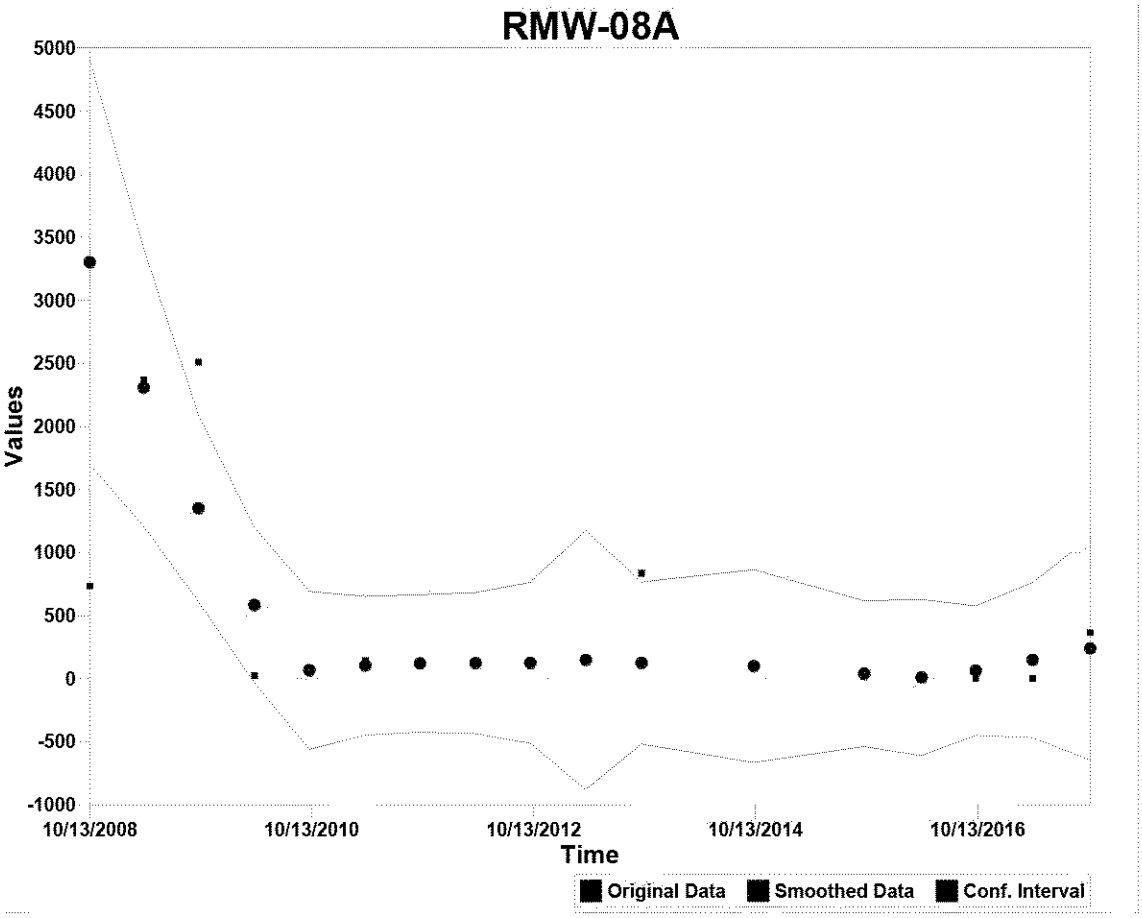
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interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-07F	
Original median interval between samples	180 days
Reduced sampling interval	90 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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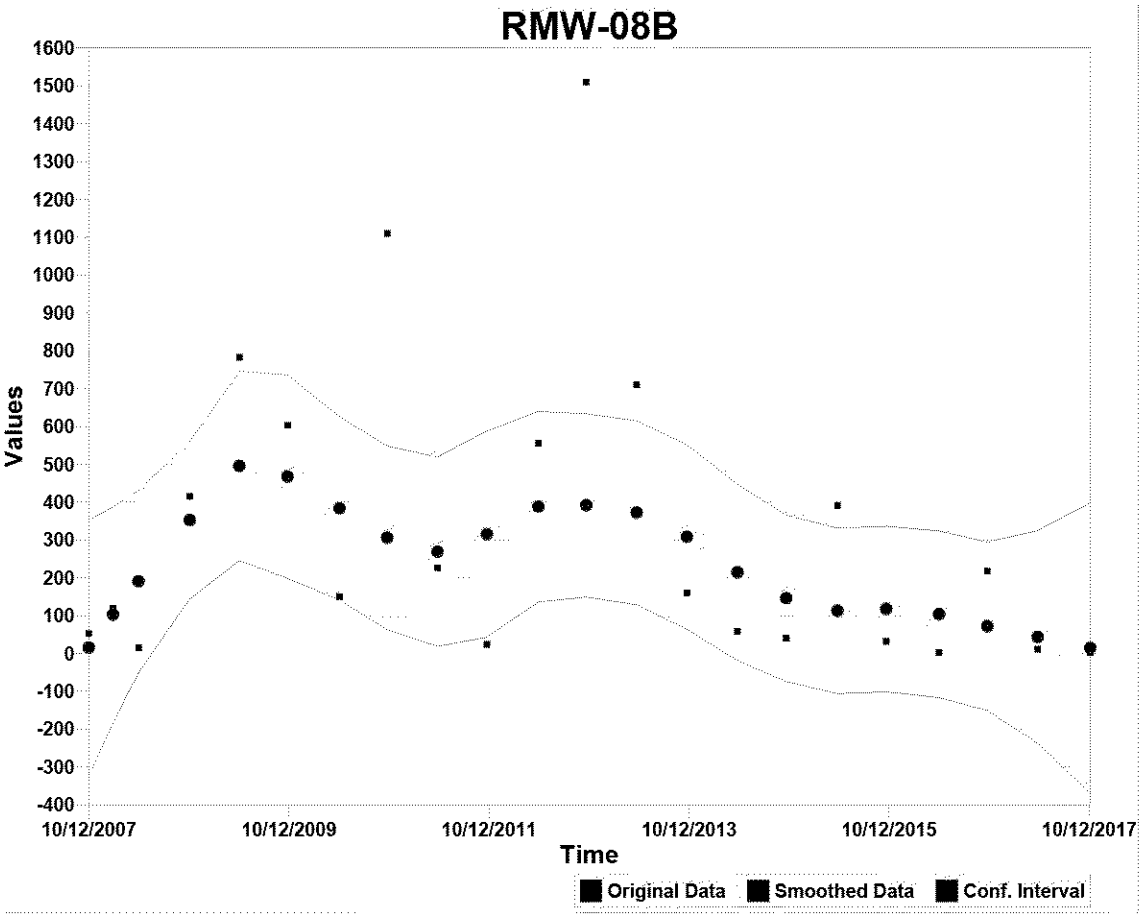
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-08A	
Original median interval between samples	183 days
Reduced sampling interval	281 days[a]
Percent reduction in sampling frequency	35%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



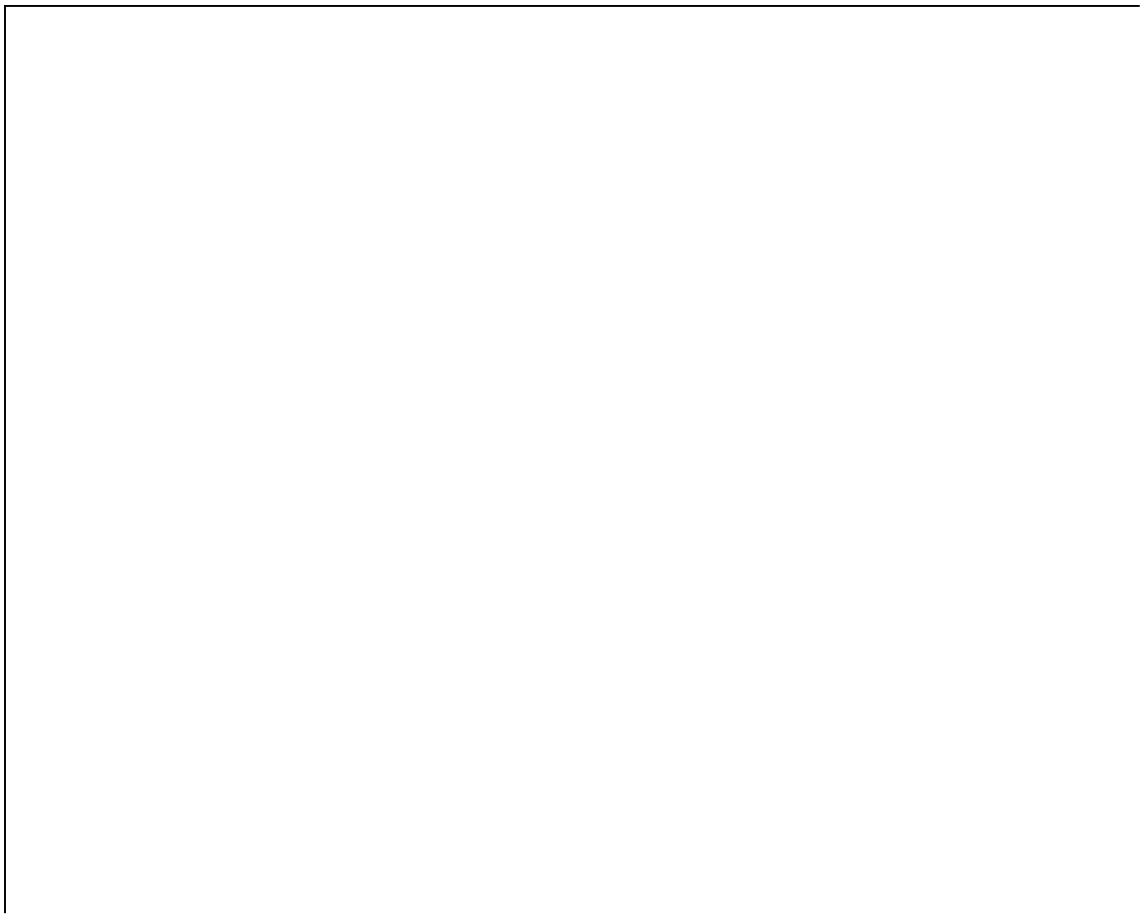
Iterative Thinning For Location RMW-08B	
Original median interval between samples	183 days
Reduced sampling interval	366 days
Percent reduction in sampling frequency	50%
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-08C	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

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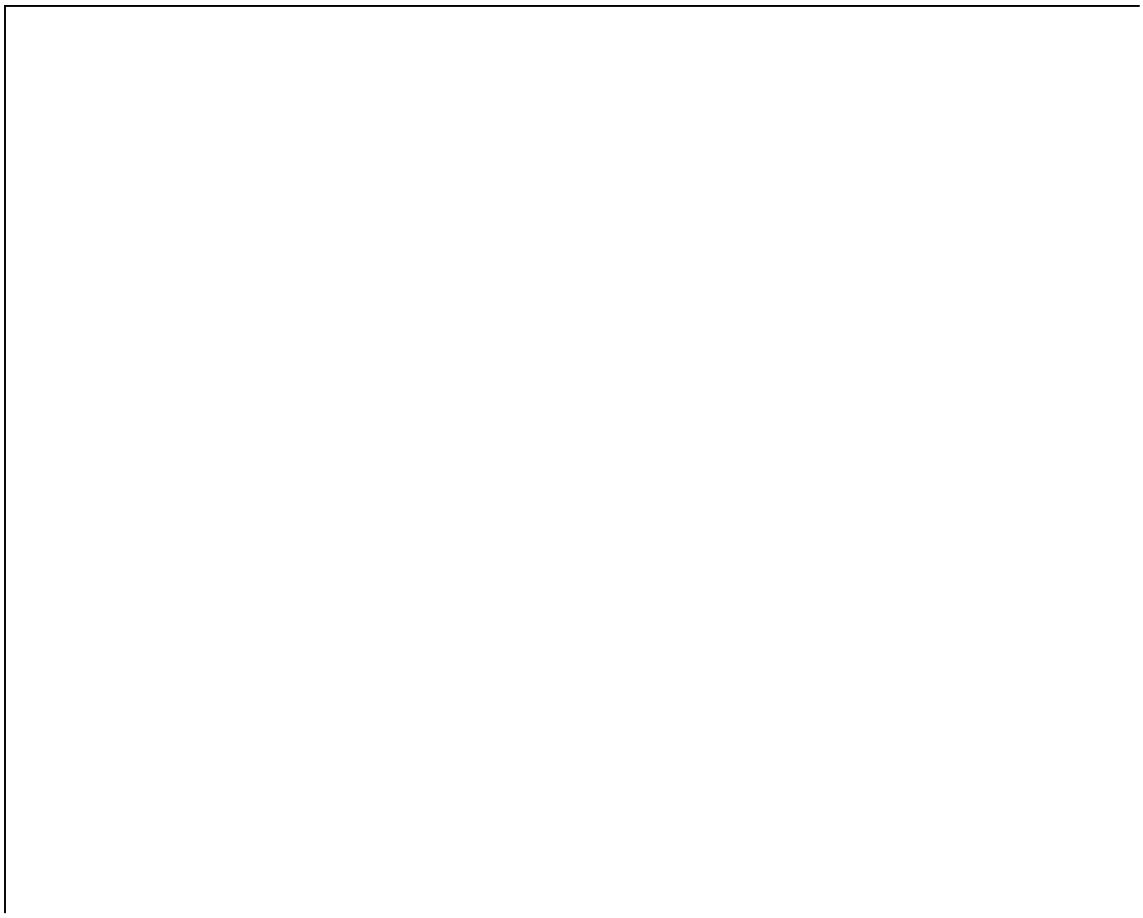
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-08D	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
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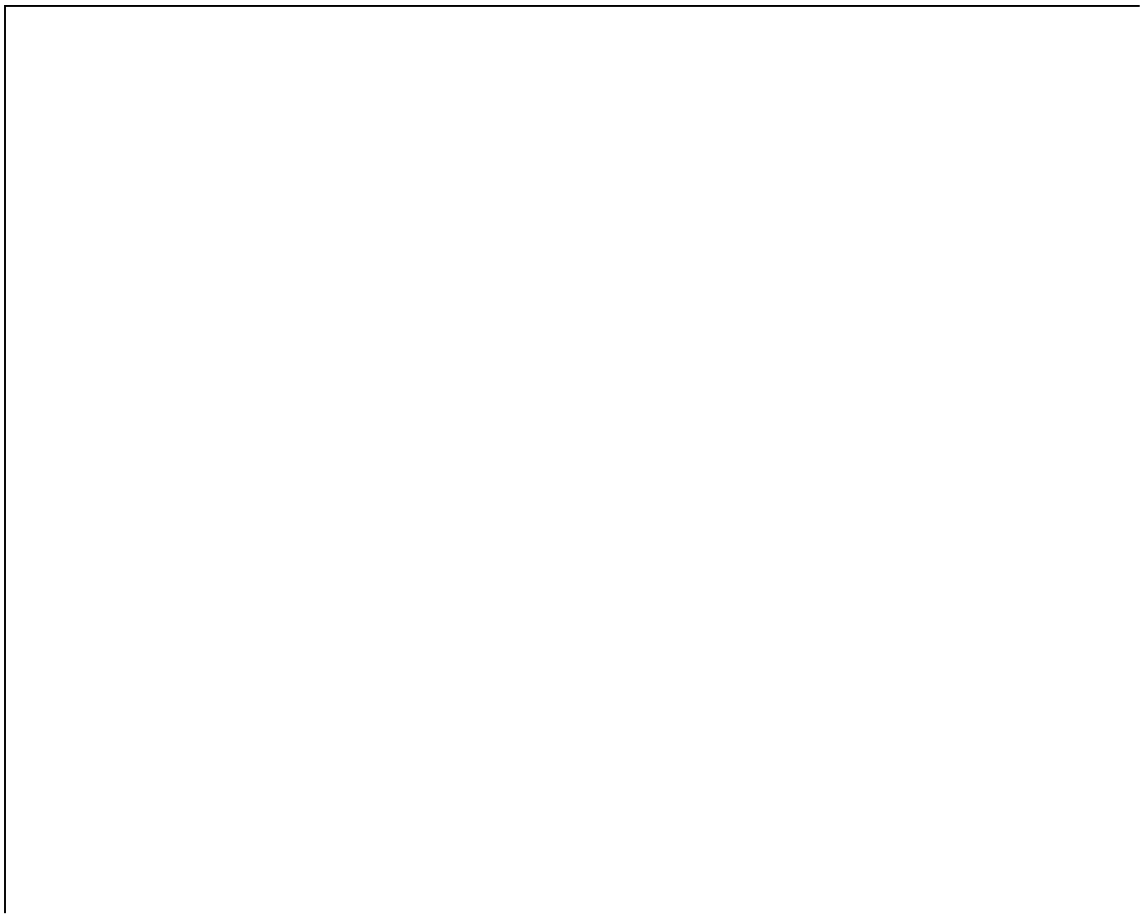
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-08E	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-102A	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-102B	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-103B	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

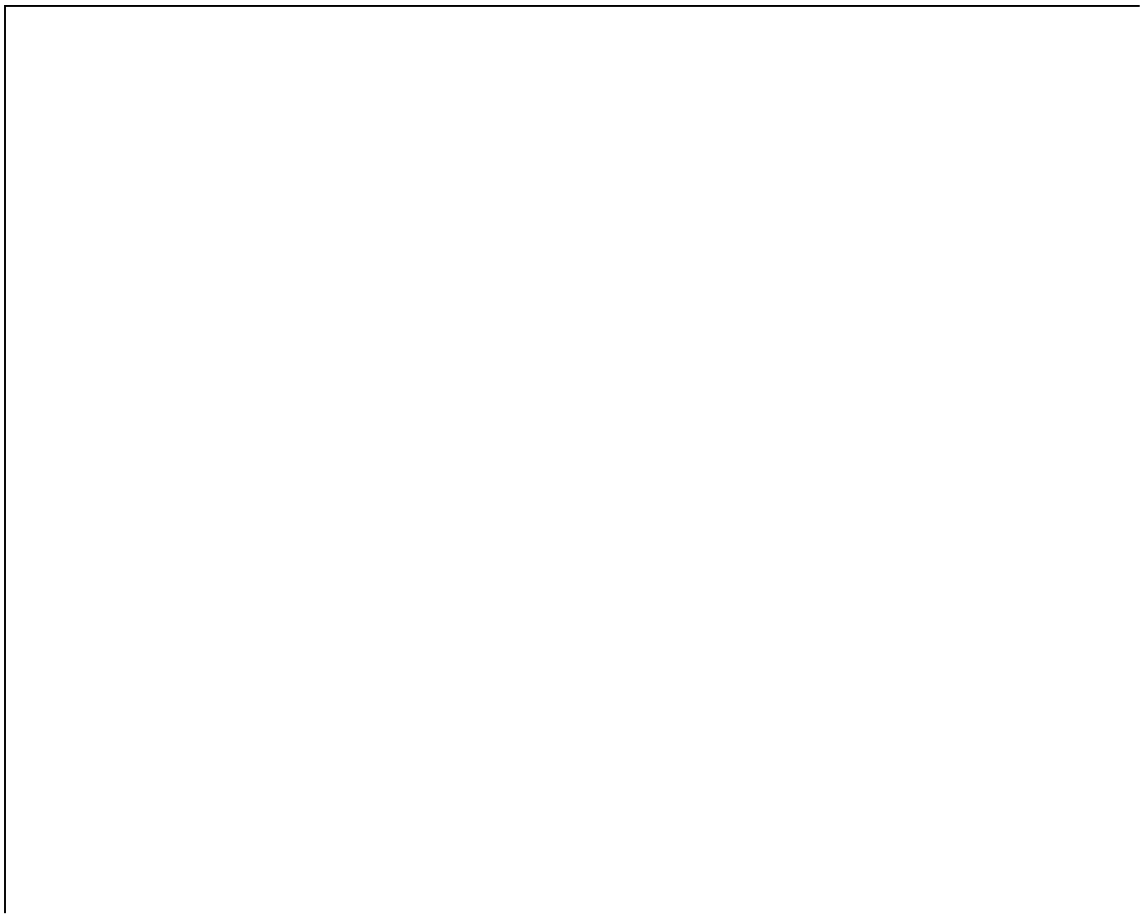
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ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-104B	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

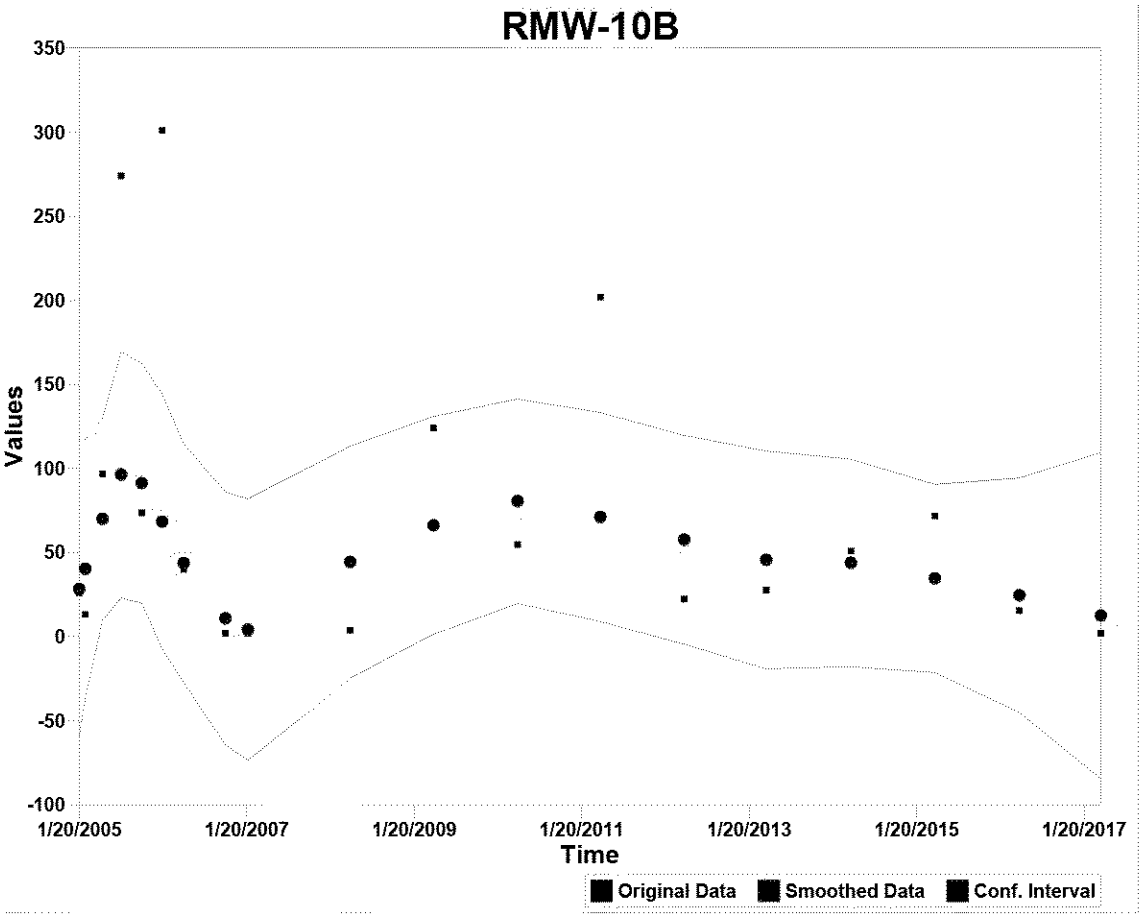
ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-105B	
Original median interval between samples	183 days
Reduced sampling interval	91 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



Iterative Thinning For Location RMW-10B	
Original median interval between samples	356 days
Reduced sampling interval	792 days[a]
Percent reduction in sampling frequency	55%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-10C	
Original median interval between samples	361 days
Reduced sampling interval	180 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-10D	
Original median interval between samples	361 days
Reduced sampling interval	180 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-10E	
Original median interval between samples	361 days
Reduced sampling interval	180 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

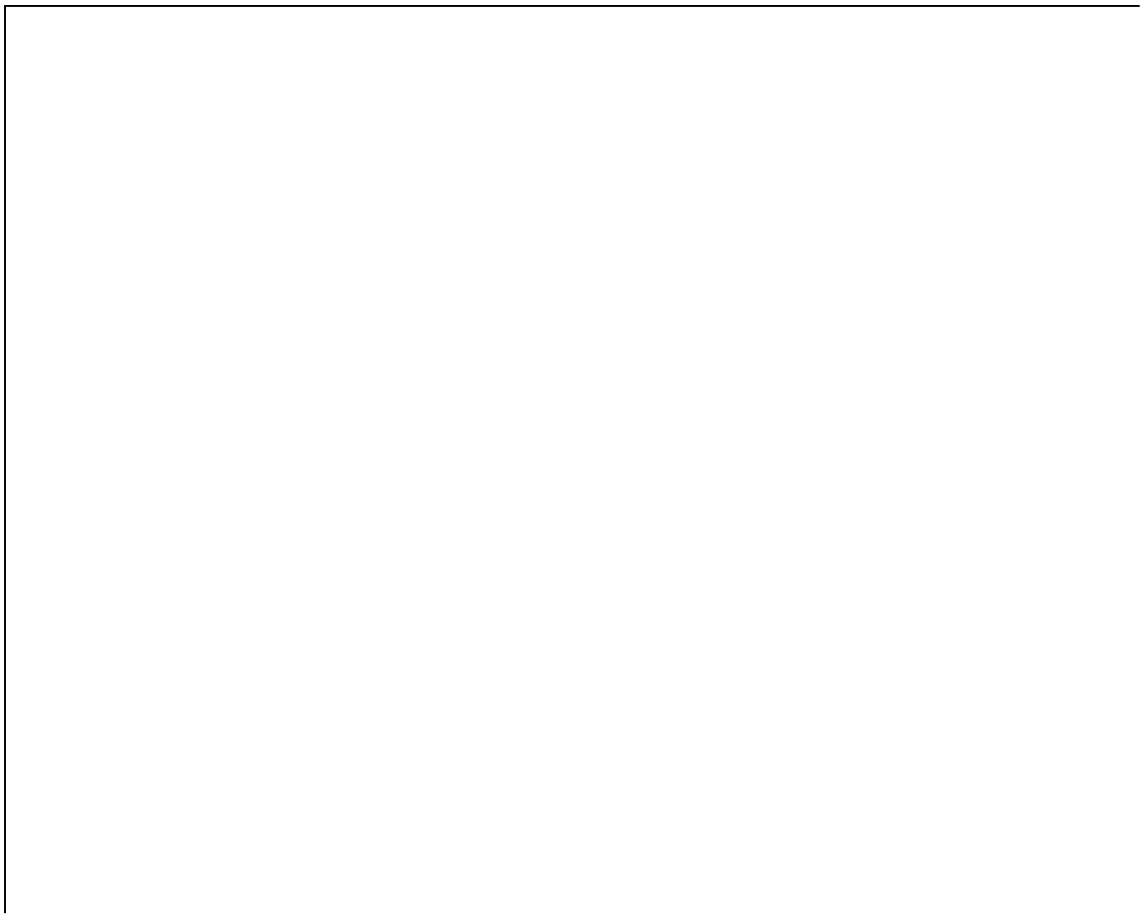
[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-15D	
Original median interval between samples	358 days
Reduced sampling interval	179 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis



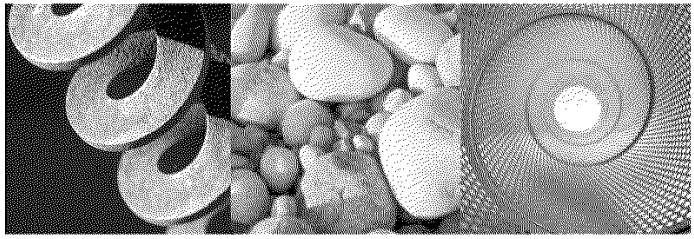
Iterative Thinning For Location RMW-15E	
Original median interval between samples	358 days
Reduced sampling interval	179 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.

ATTACHMENT 2 - Benzene Temporal Redundancy Analysis

Iterative Thinning For Location RMW-15F	
Original median interval between samples	360 days
Reduced sampling interval	180 days[a]
Percent reduction in sampling frequency	-1e+002%[a]
Simulation Parameters	
Smoothing bandwidth	0.3
Number of simulations	500
Confidence interval (CI) confidence level	90%
Percent of simulated trend required to be within the CI	75%

[a]The specified reduced sampling interval is not necessarily optimal. Either calculations were interrupted, or the trend could not be calculated with further removal of data. It may be possible to reduce the sampling
interval even further and still preserve the original trend.



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Transaction ID: 62059694
Date: May 23 2018 10:27AM
Mark Von Nida
Clerk of Circuit Court
Third Judicial Circuit, Madison County Illinois

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Consulting
Engineers and
Scientists

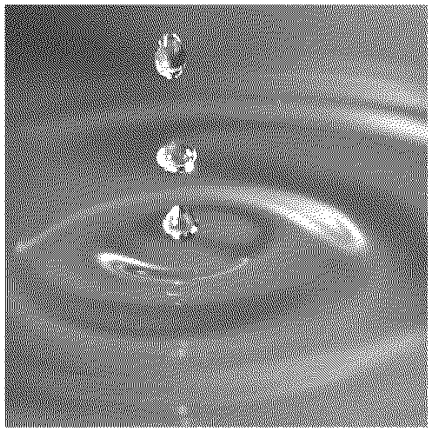
Strategic, Tactical, and Operational Plan for Site-Wide Investigation/Remediation Work

Former Hartford Refinery Facility

Submitted to:
The Premcor Refining Group Inc.
Hartford, IL

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LIST OF ACRONYMS

ASM	adaptive site management
ANSR	Applied NAPL Science Review
API	American Petroleum Institute
CAO	corrective action objective
CAOR	corrective action objectives report
CES	cost effective sampling
CO	sediment cleanup objective
COC	constituent of concern
CPT	cone penetrometer test
CMCR	corrective measures completion report
Csat	soil saturation limit
CSM	conceptual site model
EDD	electronic data deliverable
ELUC	environmental land use control
Facility	the former Hartford Refinery Facility
GEI	GEI Consultants, Inc.
GRO	groundwater remediation objective
GW	groundwater
GWCZ	groundwater convergence zone
GWE	groundwater extraction
IAGO	Illinois Attorney General's Office
ICE	internal combustion engine
Illinois EPA	Illinois Environmental Protection Agency
IGC	inward gradient control
IPBL-N	Industrial Property Boundary Line - North
IPBL-S	Industrial Property Boundary Line - South
IPEC	International Petroleum Environmental Conference
ITRC	International Technical & Regulatory Council
LNAPL	light non-aqueous phase liquid
LFDPE	low-flow dual-phase extraction
MEP	maximum extent practicable
MFE	Main Facility East
MNA	monitored natural attenuation
MNSZD	monitored natural source zone depletion
MPE	multiphase extraction
NA	natural attenuation
N/A	not applicable
NAPL	non-aqueous phase liquid
NGWA	National Groundwater Association

NSZD	natural source zone depletion
O&M	operations and maintenance
PCAs	Partial Closure Areas
PMR	Periodic Manual Recovery
Premcor	The Premcor Refining Group Inc.
RDA	River Dock Area
RO	remediation objective
ROST™	Rapid Optical Screening Tool™
SMA	St. John - Mittelhauser & Associates, Inc.
SP	South Property Area
SPR	skimmer pump recovery
SRO	soil remediation objective
SSV	sediment screening value
SVE	soil vapor extraction
Strategic Plan	Strategic, Tactical, and Operational Plan for Site-Wide Investigation/ Remediation Work
TACO	35 Illinois Administrative Code (IAC) Part 742 (Tiered Approach to Cleanup Objectives)
TFE	Total Fluids Extraction
T_n	LNAPL Transmissivity
U.S. EPA	United States Environmental Protection Agency
WPB	Western Property Boundary Area
WPBL	Priority Area of the Western Property Boundary (Western Property Boundary Line)

Executive Summary

This *Strategic, Tactical, and Operational Plan for Site-Wide Investigation/Remediation Work* (Strategic Plan) presents the pathway to site closure at the former Hartford Refinery Facility (Facility) and defines the final remedial action plan for the Facility. The document presents a summary of work completed under Illinois Environmental Protection Agency (Illinois EPA) supervision, a summary of the conceptual site model (CSM) and current site status; the philosophy for this Strategic Plan and fundamentals for its success; the working process to implement this Strategic Plan moving forward; and the plan to transition from the initial monitoring, investigation, and removal response actions conducted under the 2007 draft Consent Order to conducting final remediation activities under this Strategic Plan to achieve a permanent remedy at the site in accordance with the Consent Order, Case Number 03 CH 459 (Madison County) dated on or about May 18th, 2018.

In response to a perceived imminent and substantial threat to human health and the environment relating to the potential migratory capacity of contamination at the Facility, The Premcor Refining Group Inc. (Premcor) has been cooperating with the Illinois EPA to implement initial response actions. Initial response actions, addressing site conditions, have focused largely on the western property boundary, which is considered a priority area due to the natural hydrogeology of the site, a perceived possibility of migration from beneath the Facility to beneath the Village of Hartford, and the area's general proximity to the Village of Hartford. Other initial response actions conducted under Illinois EPA supervision include work to characterize the site and the comingled plume of hazardous substances.

Premcor's initial environmental response has addressed more immediate concerns at the property. Now, this Strategic Plan sets out a final remedy for the site, a path to reaching remedial action decision points, and the steps necessary to achieve a permanent remedy at the Facility with the requisite consistency, certainty, and effectiveness.

The fundamental goal of all corrective action activities at the Facility is to protect human health and the environment. The endpoint for the corrective actions will be defined in accordance with the applicable laws and regulations of the State of Illinois, primarily the risk-based requirements of 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives or TACO). Currently, a combination of natural controls, institutional controls, and engineered systems, implemented as part of Premcor's ongoing initial response actions, are utilized to control exposure routes to on-site and off-site receptors. This Strategic Plan outlines the approach to meet remedial action objectives and identify the decision points where natural controls are sufficient on their own to permanently protect human health and the environment, as well as the monitoring and/or evaluation that will be implemented to ensure protection of human health and the environment until the TACO endpoints are met.

This Strategic Plan is designed to improve the consistency, efficiency, and certainty of the ongoing corrective action process by:

- Implementing adaptive site management (ASM) principles within applicable Illinois regulatory programs;
- Streamlining management and reporting; and
- Specifying procedures, quantitative metrics, and thresholds for those metrics inherent to risk-based remediation programs, developed in accordance with the Illinois EPA's TACO and United States Environmental Protection Agency (U.S. EPA) or other guidance documents that are acceptable to Illinois EPA, to provide clear, measurable, and attainable objectives and targets for corrective action.

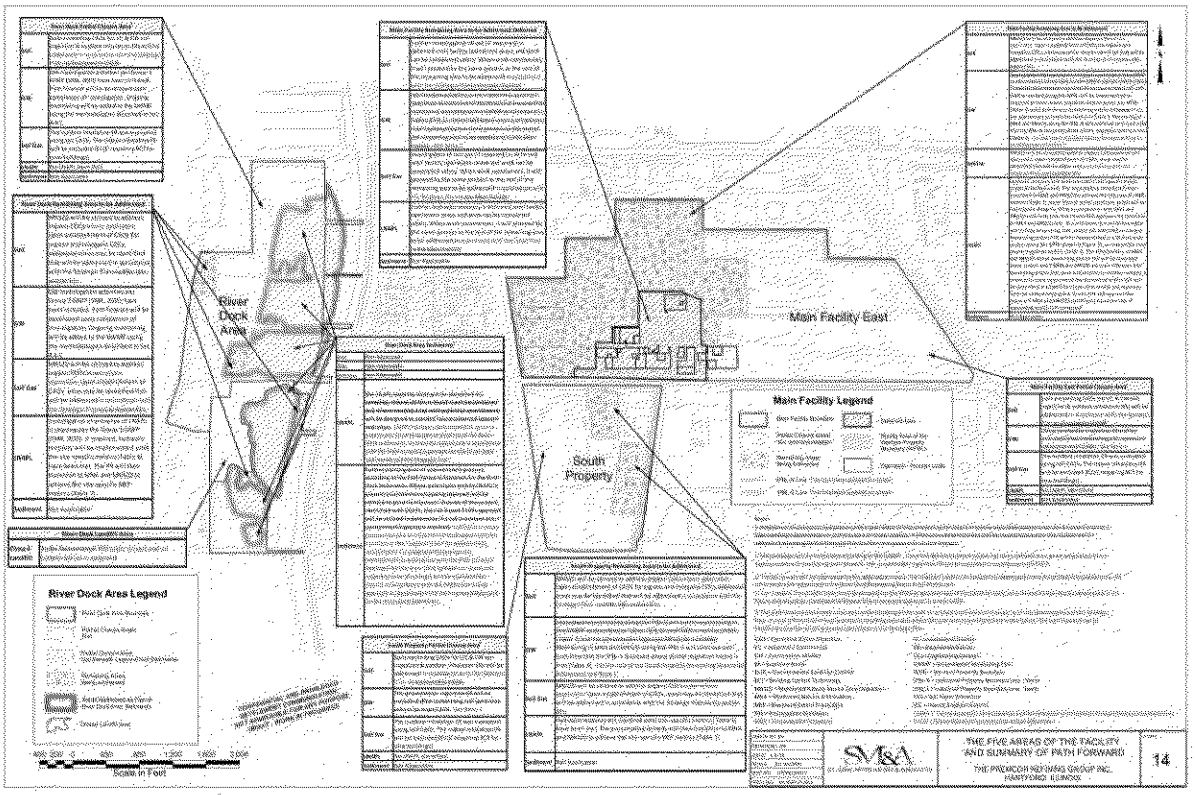
ASM is an approach in which policies and remedies are implemented based on the best available data, and the site response is monitored, interpreted, and used to adjust programs in an iterative manner, leading to ongoing improvements in knowledge and performance (ITRC 2017). ASM incorporates the concept of presumptive remedies and the technologies demonstrated to be effective at the Facility. Implementing ASM is intended to streamline management as well as accelerate the timeframe to achieving the corrective action objectives by providing Premcor the flexibility to implement and adjust the presumptive remedies at its own initiative.

Streamlined reporting procedures are also described in this Strategic Plan. The intent of these reports is to focus on the evaluation of the site status and progress toward achieving the corrective action objectives. This evaluation is critical to ASM to ensure that data collected is routinely incorporated into the CSM, interpreted, and the remedial approach is adjusted if required.

This Strategic Plan will create greater certainty and finality in the remedial process by eliminating uncertainty in the site-specific elements as they pertain to the remedial implementation, and capitalizing on the flexibility inherent within TACO and other applicable rules and regulations. This Strategic Plan aims to define, in specific and quantifiable language, these site-specific elements. The decision point metrics and TACO requirements need to be met to obtain closure of the Facility. In the case that the site-specific decision point metrics are met, but TACO requirements are not, corrective action will continue until such time that Illinois EPA determines that TACO requirements are met.

To the degree feasible, this Strategic Plan describes the pathway to advance the Facility from the current conditions to site closure. Where uncertainty remains, or site conditions change, a process is defined to modify and/or incorporate additional elements in the future.

The path forward for all the remaining areas to be addressed is summarized in the figure below (see full size figure following the text).


River Dock Area
Main Facility East
South Property
Main Facility Legend
River Dock Area Legend
THE FIVE AREAS OF THE FACILITY AND SUMMARY OF PATH FORWARD
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
14

1. INTRODUCTION AND PURPOSE

1.1 OVERVIEW

The Premcor Refining Group Inc. (Premcor) will continue to work collaboratively with the Illinois Environmental Protection Agency (Illinois EPA) to protect human health and the environment regarding the former Hartford Refinery Facility (Facility) by:

- Implementing adaptive site management (ASM) principles within applicable Illinois regulatory programs;
- Streamlining management and reporting; and
- Specifying procedures, quantitative metrics, and thresholds for those metrics inherent to risk-based remediation programs, developed in accordance with the Illinois EPA's Tiered Approach to Cleanup Objectives (TACO) and United States Environmental Protection Agency (U.S. EPA) or other guidance documents that are acceptable to Illinois EPA, to provide clear, measurable, and attainable objectives and targets for corrective action.

Implementation details will be provided in subsequent sections of this *Strategic, Tactical, and Operational Plan for Site Wide Investigation/Remediation Work* (Strategic Plan). The general Strategic Plan approach, within Illinois EPA regulatory programs, is presented in Figure 1. The principles of ASM are described in Section 4.

This Strategic Plan is intended to replace or incorporate, as noted herein, all other plans and corrective action activities at the Facility. Initial response actions at the Facility were completed pursuant to the draft Consent Order (2007), with specific work outlined in Appendices B and C. This Strategic Plan is designed to eliminate the uncertainty of the initial response actions and draft Consent Order (2007), and to identify an approach to reaching a permanent remedy at the Facility with appropriate remediation end points. This includes identifying and addressing the work remaining in Appendices B and C of the draft Consent Order (2007). To this end, Appendix A1 includes a tabular comparison of initial response action progress relating to the work outlined in Appendices B and C of the draft Consent Order (2007). Appendix A2 lists the key documents associated with the draft Consent Order developed and submitted to the Illinois EPA, along with associated Agency comments.

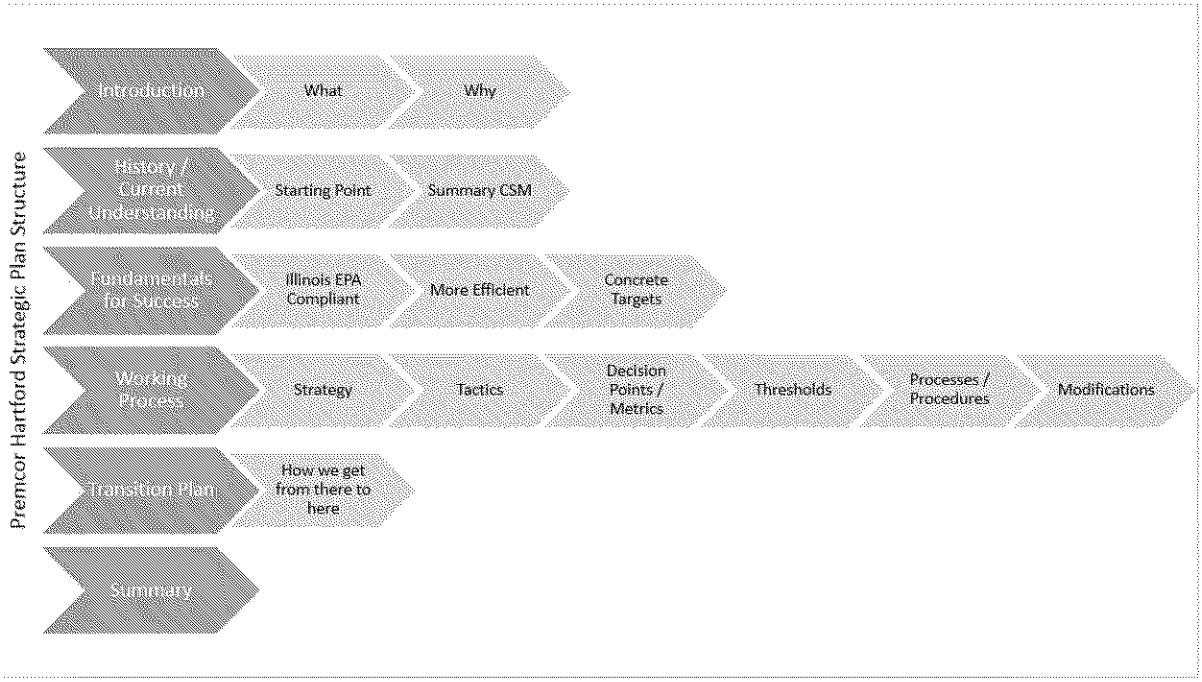


Figure 1 Overview of the general Strategic Plan approach.

1.2 STRUCTURE

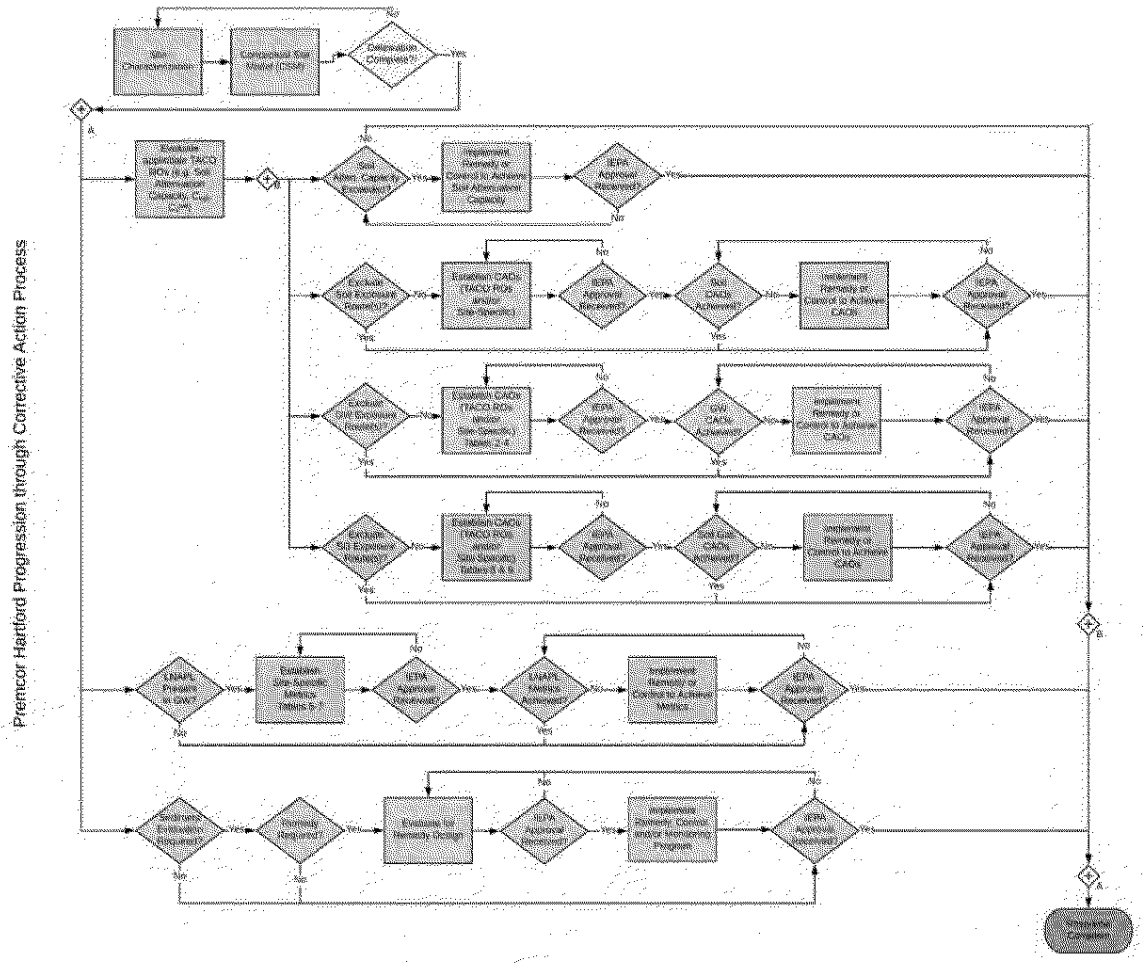
Protection of human health and the environment will be met in accordance with Illinois EPA regulations, and will be driven by measured data and evaluations of measured data for the Facility within the context of scientific understanding of the constituents of concern (COCs) at the site (including, but not limited to, metals; hydrocarbon light non-aqueous phase liquid [LNAPL]; sorbed-, dissolved-, and vapor-phase hydrocarbons; and COCs identified in Appendix 3 of the Consent Order) specified in scientific references as jointly agreed to by Illinois EPA and Premcor, including but not limited to:

- U.S. EPA guidance and publications;
- ASTM International (ASTM) standards, guides, and other documents;
- Interstate Technology and Regulatory Council (ITRC) guidance and training documents;
- American Petroleum Institute (API) documents and tools;
- Scientific peer-reviewed publications such as Groundwater Monitoring & Remediation, Applied NAPL Science Review (ANSR), and others;
- Scientific training documents such as ASTM, National Groundwater Association (NGWA), and others; and
- Conference proceedings and papers such as the Battelle International Conferences (Chlorinated Organics, Bioremediation, and Sediments), International Petroleum Environmental Conference (IPEC), NGWA Conferences and others.

Any proposed reference material must be approved by Illinois EPA. Reference material will be provided to Illinois EPA if such request is made in writing by Illinois EPA, subject to copyright laws and limitations.

This Strategic Plan represents the science-based and risk-based consensus approach, developed jointly by Illinois EPA and Premcor, to efficiently and effectively protect human health and the environment.

The Strategic Plan was formalized jointly with Illinois EPA and Premcor and forms the basis for modification or replacement of Appendix B and Appendix C in the draft Consent Order (2007) for the Facility in accordance with the Consent Order, Case Number 03 CH 459 (Madison County) dated on or about May 18th, 2018.



Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program (35 Ill. Adm. Code 724). Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).

Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, technical impracticability demonstration or any other program allowable under the TACO regulation.

Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Site characterization, integration of data into the conceptual site model, and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion, and/or as required by the Illinois EPA, to enhance the conceptual site model and proceed to the next stage of the process.

Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
CO - Sediment Cleanup Objective
Csat - Soil Saturation Limit
C_v^{sat} - Soil Vapor Saturation Limit
CSM - Conceptual Site Model
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
LNAPL - Light Non-Aqueous Phase Liquid
RO - Remediation Objective
SG - Soil Gas
SSV - Sediment Screening Value
TACO - 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives)

MS01: Premcor Hartford Strategic Plan - Progression through Corrective Action Process

Assumption: Only chronic (no acute) concerns exist.

Figure 2 General overview of the Illinois EPA Corrective Action Process approach utilizing 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives or TACO) to complete the remedial response (see full size figure following the text). No changes to the remedial process will result in off-site migration of COCs above metrics specified in TACO and Section 4.3.

The overall structure of the Strategic Plan, as shown in Figure 2, is based on TACO. The corrective action objectives (CAOs) may be defined as the Tier 1, Tier 2, or Tier 3 remediation objectives (ROs) from TACO, as site-specific CAOs defined in a corrective action objectives report (CAOR), and/or as site-specific metrics as defined in Section 4.3.

1.3 OVERVIEW OF PROGRESSION THROUGH CORRECTIVE ACTION

Figure 2 provides a general overview of the Illinois EPA corrective action process approach utilizing TACO to complete the remedial response. The flowchart identifies the affected media as well as the review and approval points with the Illinois EPA. While Illinois EPA approval is required to finalize CAOs, Premcor may implement remedies as described in this Strategic Plan on its own initiative prior to finalization of the CAOs. No changes to the remedial process will result in off-site migration of COCs above metrics specified in TACO and Section 4.3.

As presented in Figure 2, when site characterization, conceptual site model (CSM) development, and delineation are complete, each media exposure route under TACO will be evaluated. For each route, the general progression is to determine if the route can be excluded, and if not, establish and achieve Illinois EPA-approved metrics through remedies and/or controls. Once the agreed-upon metrics have been met and Illinois EPA approval is received, the response for the route is complete. The routes may or may not be evaluated concurrently, and when all responses are complete the site can apply for closure.

2. HISTORY, SUMMARY OF CONCEPTUAL SITE MODEL, AND CURRENT UNDERSTANDING

2.1 HISTORY

A general history focused on details relevant to this forward-looking Strategic Plan is provided based on SMA's *Project Background Information, Technical Activities, and Conceptual Site Model at the Premcor Refining Group Inc. Hartford, Illinois Facility* (2018), submitted under separate cover and included as Appendix 2 to the Consent Order. Much of the work presented herein was developed under the auspices and scope of the draft Consent Order (2007) Appendices A, B, and C. This section summarizes current conditions and the progress achieved by initial response activities at the Facility. As such, this section provides the baseline "starting point" for this Strategic Plan.

Initial soil and groundwater (GW) investigation began at the Facility as early as the late 1970s. Since 2003, Premcor initiated extensive new investigations and other initial response actions. Certain initial response actions are outlined in the draft Consent Order (2007) in Appendices B and C. A summary list of all workplans and reports submitted and the date of approval of each by Illinois EPA, is provided in Appendix A2. The detailed backup for the summary information herein is presented in *Project Background Information, Technical Activities, and Conceptual Site Model at the Premcor Refining Group Inc. Hartford, Illinois Facility* (SMA 2018). Updates to the CSM will be provided in reports as detailed in Section 4.4.2. These plans have been adopted, replaced, or incorporated into this Strategic Plan as detailed in Section 5.

The general extents of soil impacts and most of the groundwater impacts by LNAPL, dissolved-phase hydrocarbons, metals, and Skinner List COCs have now been defined, except for groundwater in the River Dock Area (RDA), though Illinois EPA may require additional characterization work as specified elsewhere in this Strategic Plan. The *Group 3 Groundwater Investigation Work Plan* (SMA 2015) was submitted to Illinois EPA in October 2015 and was approved by the Agency on August 1, 2017. Investigation work in this area is expected to begin in 2018. Based on the datasets referenced above, a robust and dynamic CSM has been developed, and is updated periodically as new data warrants. The CSM is a critical component of the Strategic Plan.

Multiple technologies have been tested, implemented, and optimized to site conditions as part of the ongoing initial response actions necessary to characterize contamination at the site and/or address a perceived imminent and substantial threat to human health and the environment. These initial response actions have yielded a database of approaches known to

be effective at the Facility, hereinafter incorporated into the Strategic Plan as options for obtaining remedial action objectives and referred to as "presumptive" remedies. These presumptive remedies, in concert with standard presumptive remedies (e.g., excavation), can be applied at the Facility with no further proof of concept, technology selection, or design work.

Figure 3 shows the Facility boundaries in red dotted lines, including the RDA to the west of the Village of Hartford and the Main Facility to the east of the Village. This figure also provides a "key" map showing the historic group and area boundaries.

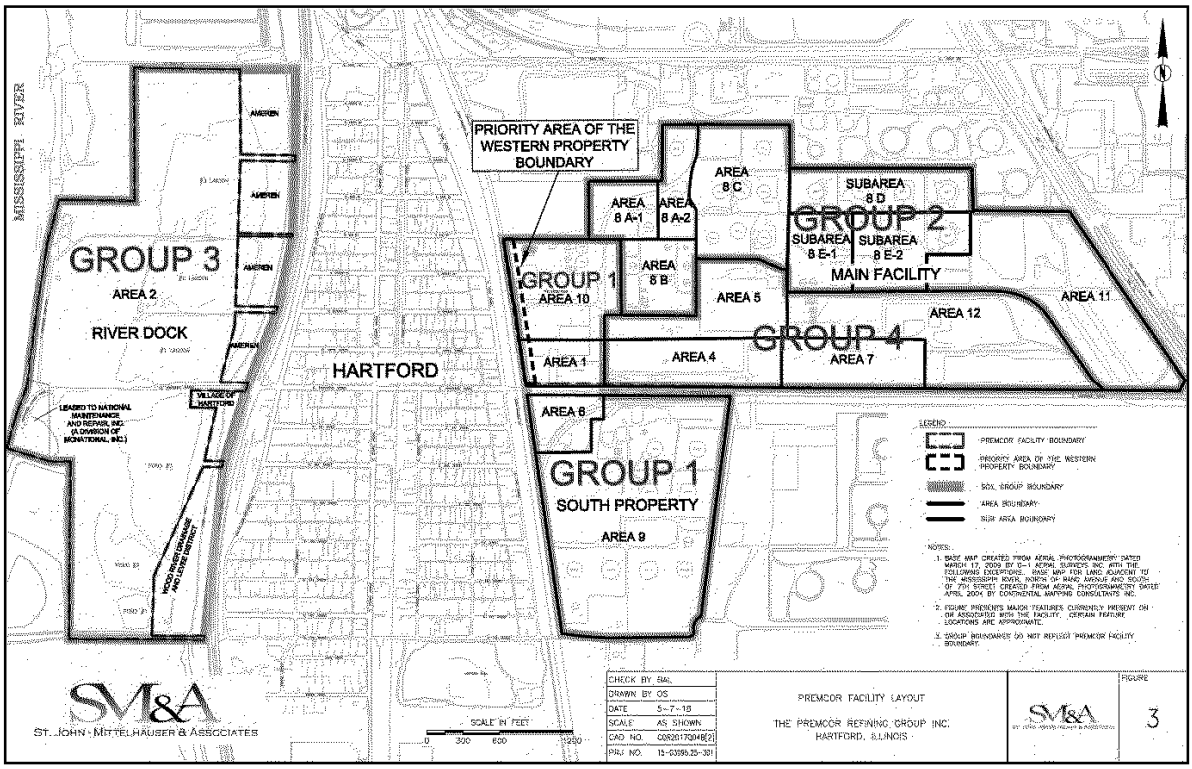


Figure 3 Facility map identifying the Main Facility, South Property, and RDA; the priority area of the Western Property Boundary (WPBL); and the historic soil investigation areas (see full size figure following the text). Investigation area extents are not exact property boundaries.

Figure 4 shows the substantial network of soil borings, cone penetrometer test/Rapid Optical Screening Tool ™ (CPT/ROST ™) borings, and wells that have been installed at the Facility to characterize conditions, resulting in a site with extensive investigation, known conditions, and a well-documented CSM. The system of sampling, monitoring, and removal wells assists in migration control by collecting critical data and/or minimizing the size of the contamination plume through ongoing hydrocarbon removal.

Based on the extensive site investigations completed, areas of the Facility have been identified for Partial Closure. CAORs for the initial three Partial Closure Areas (PCAs)

document the development of CAOs within the Facility. The initial three PCAs, as identified in Figure 5, are the Main Facility East (MFE), the South Property Area (SP), and the RDA. Reports for these areas were submitted to the Illinois EPA as separate documents from this Strategic Plan, as listed in Section 5.1, in accordance with Section 4.4.2 of this Strategic Plan. It is anticipated that, in the future, additional media and/or areas within the Facility may be partitioned off and brought to closure as well. Any work associated with the corrective action activities, including, but not limited to, ongoing initial response actions and implementation of remedies, institutional controls, and/or engineering controls, will be performed under this Strategic Plan.

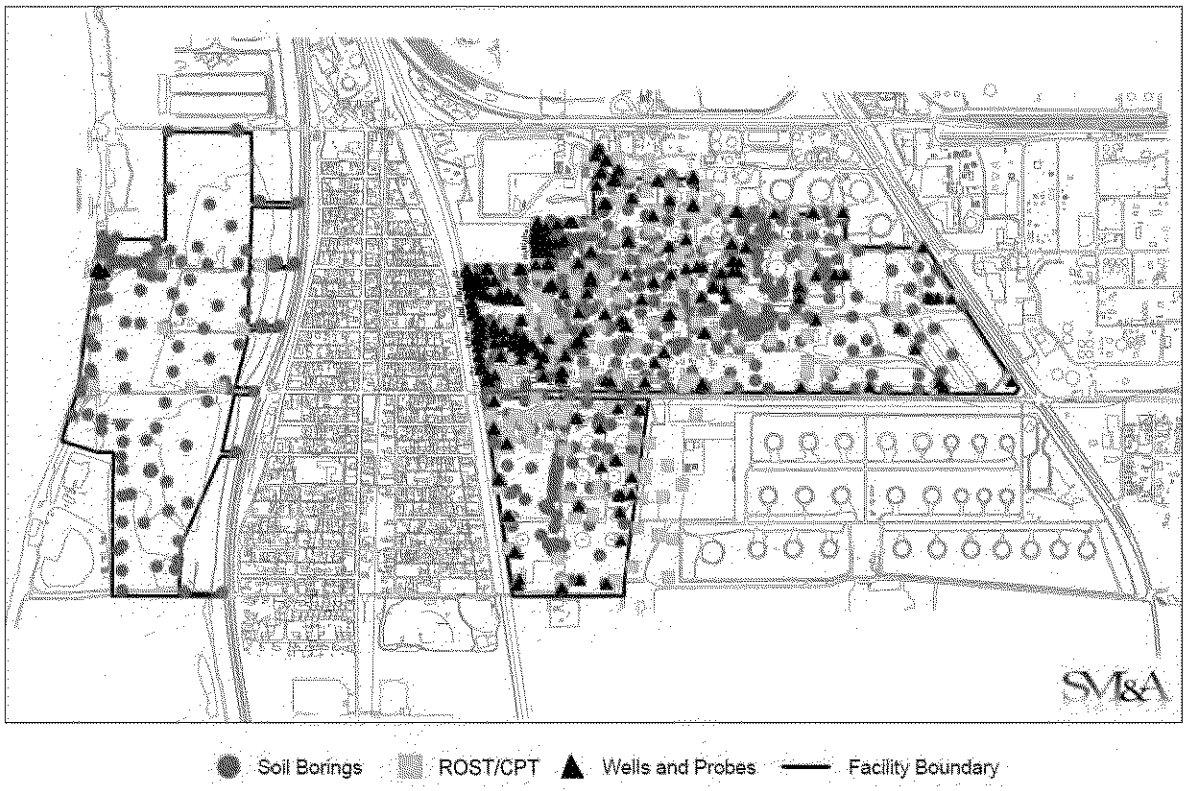


Figure 4 Map identifying the location of soil borings, CPT/ROST™ borings, and wells site-wide.

The Deferred Remediation Area, as presented in Figure 5, is a portion of the Facility that is operated by others. It is recognized that these operations impact the level of active remediation that can occur in this area. Once operations cease in this select area and the work can be conducted safely, this Strategic Plan will be used to direct any future Facility closure efforts in this area as necessary.

Any current or future non-Premcor operators in the Facility, including, but not limited to, the Deferred Remediation Area, have their own reporting and response requirements for any new/future releases while operating.

Figure 5 also identifies the areas addressed in *Path Forward Approach for the River Dock Area Sediments, Premcor Facility* (GEI 2018a),included as Appendix A3 (discussed in Section 2.3.2), as well as the remaining areas to be addressed (discussed in Section 4.2).

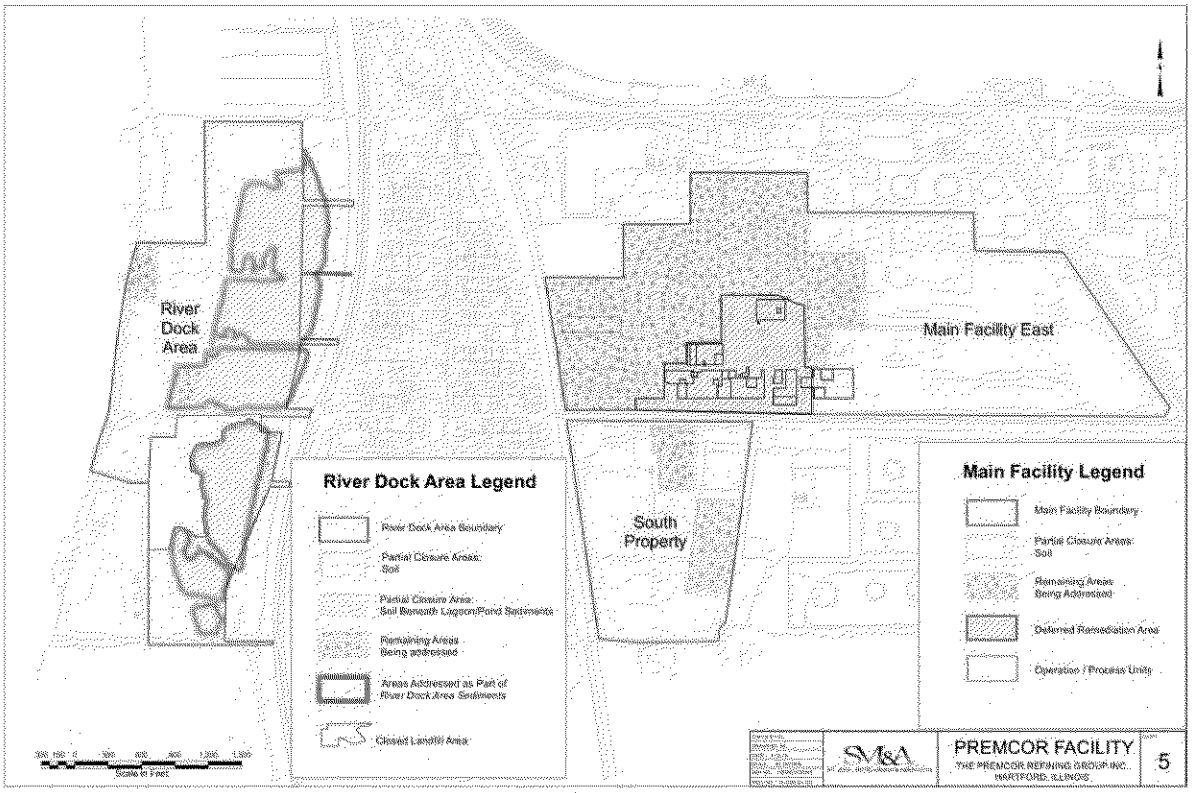


Figure 5 Map identifying the location of the PCAs, Deferred Remediation Area, Areas Addressed as Part of the River Dock Area Sediments, and remaining areas to be addressed (see full size figure following the text).

2.2 OVERVIEW OF THE CONCEPTUAL SITE MODEL (CSM)

The initial CSM was provided in the June 30, 2006 *Site Wide Soil Investigation Work Plan*. It was continually updated in the successive free product investigation reports and the group soil investigation reports. The CSM for the Facility (SMA 2018) provides a summary and extensive understanding of hydrocarbon distribution by phase as well as the geologic and hydrogeologic conditions and controls on distribution, migration potential, recoverability, and exposure potential of hydrocarbon in all phases.

Both engineering controls put in place as part of Premcor's initial response actions and natural controls are in place to establish LNAPL body, dissolved-phase, and vapor-phase plume stability for exposure control and protection of human health and the environment. Multiple approaches have been implemented to supplement these initial responses and natural controls by reducing hydrocarbon mass and effectuating hydrocarbon compositional change toward decision points where natural degradation remedies are of greater effectiveness and efficiency than engineered remedies.

As defined for purposes of this Strategic Plan, controls typically contain and/or prevent exposure to COCs, while a remedy works to reduce COCs. Due to the hydrogeology of the site, however, there is some overlap in the impact and purpose of the controls and remedies outlined below. For example, Premcor's initial response actions addressing potential imminent migration threats contained both "controls" and "remedies" as they are defined herein. All ongoing activities at the site are adopted into this Strategic Plan.

2.2.1 Controls

Engineering controls at the Facility currently include:

- Hydraulic groundwater migration control through groundwater pumping (Figure 6); and
- Vapor-phase migration control through soil vapor extraction (SVE) (Figure 7).

Each of the engineering controls discussed below was implemented to limit potential migration, improve stability, or reduce the volume of the plume.

Hydraulic Groundwater Migration Control

The purpose of the Inward Gradient Control (IGC) system is to limit dissolved-phase COCs in groundwater from migrating off-site along the WPBL. Appendix A4 lists the fluid gauging wells used to monitor the IGC system that consists of shallow pumping wells and a production well. The inward hydraulic gradient will be monitored and demonstrated along the WPBL according to Table 3. The requirements for gauging and evaluating groundwater flow are detailed in the Groundwater Monitoring Plan (Section 4.4.1), and operational processes and procedures are included in Appendix A6.

The IGC via groundwater extraction (GWE) as needed system is designed to be superseded when site data demonstrates that the LNAPL body and dissolved-phase plumes are stable and the transition to bioventing and/or SVE, as necessary based on current conditions at that time, is adequate to prevent LNAPL and dissolved-phase constituents above metrics, specified in Table 3 and Table 4, from migrating off-site, as described in Section 4.3.

Vapor-Phase Migration Control

The purpose of the SVE engineering control system is to limit the potential of vapor-phase COCs from migrating off-site along the WPBL. It also serves to enhance LNAPL recovery. Appendix A4 lists the SVE wells used to monitor this control system. The system will be monitored in accordance with Table 8 and Table 9. The operational processes and procedures are included in Appendix A6.

LNAPL migration is primarily controlled by the natural geologic and hydrogeologic processes described in this section. For LNAPL under unconfined conditions, the inward gradient system for hydraulic groundwater migration control may also act as an engineering control for LNAPL.

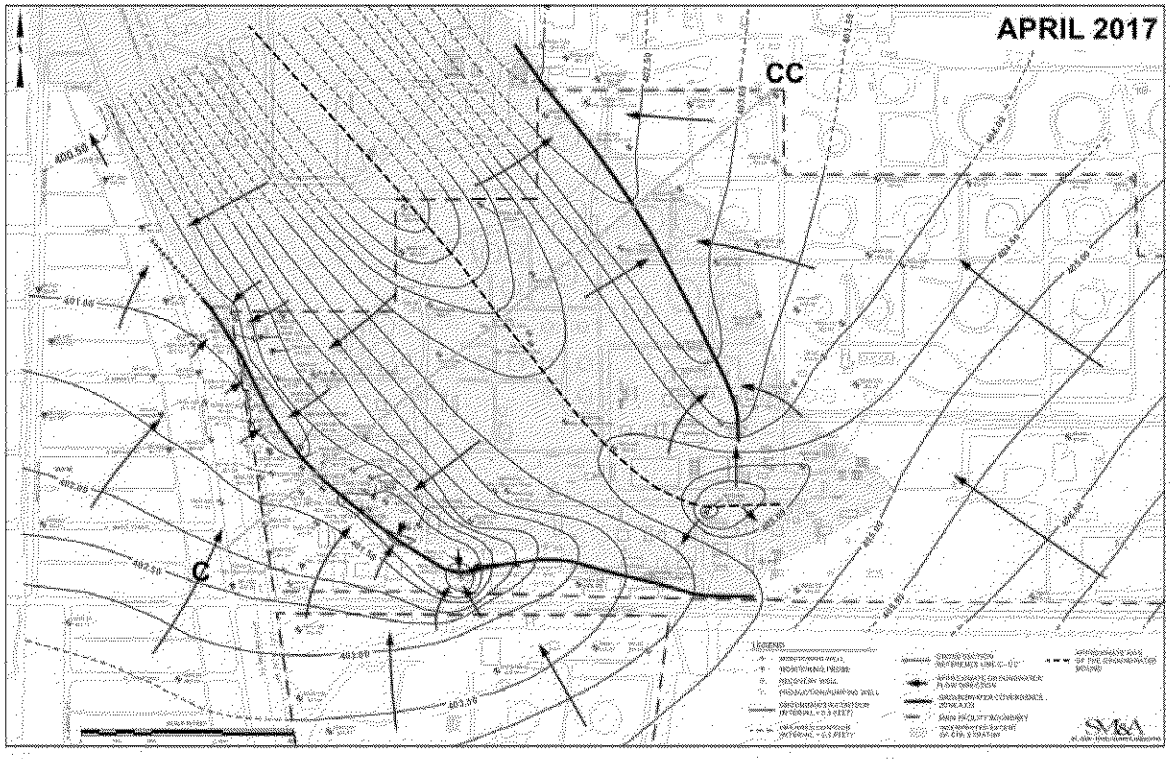


Figure 6 Contour map identifying hydraulic control in the EPA Stratum and Main Sand along the WPBL from April 2017 (see full size figure following the text). Also shows the location of cross section C-CC for Figure 8. Hydraulic control is provided by an engineered inward gradient system that is one of the presumptive remedies for the Facility. Inward gradient is also maintained in the Main Sand. Further details can be found in SMA 2018 (submitted under separate cover and included as Appendix 2 to the Consent Order).

Hydraulic control of LNAPL and groundwater is currently provided along the western property boundary area (WPB). Implementation and development of a site wide IGC system for groundwater has been suspended since 2010 with Illinois EPA approval. During this interim period, groundwater monitoring and reporting continued in accordance with the *Groundwater Monitoring Plan (Rev 3)* (SMA 2013a). It is expected that additional hydraulic control of LNAPL and groundwater along other property boundaries will not be necessary, as demonstrated by achieving the metrics prescribed in Table 4.

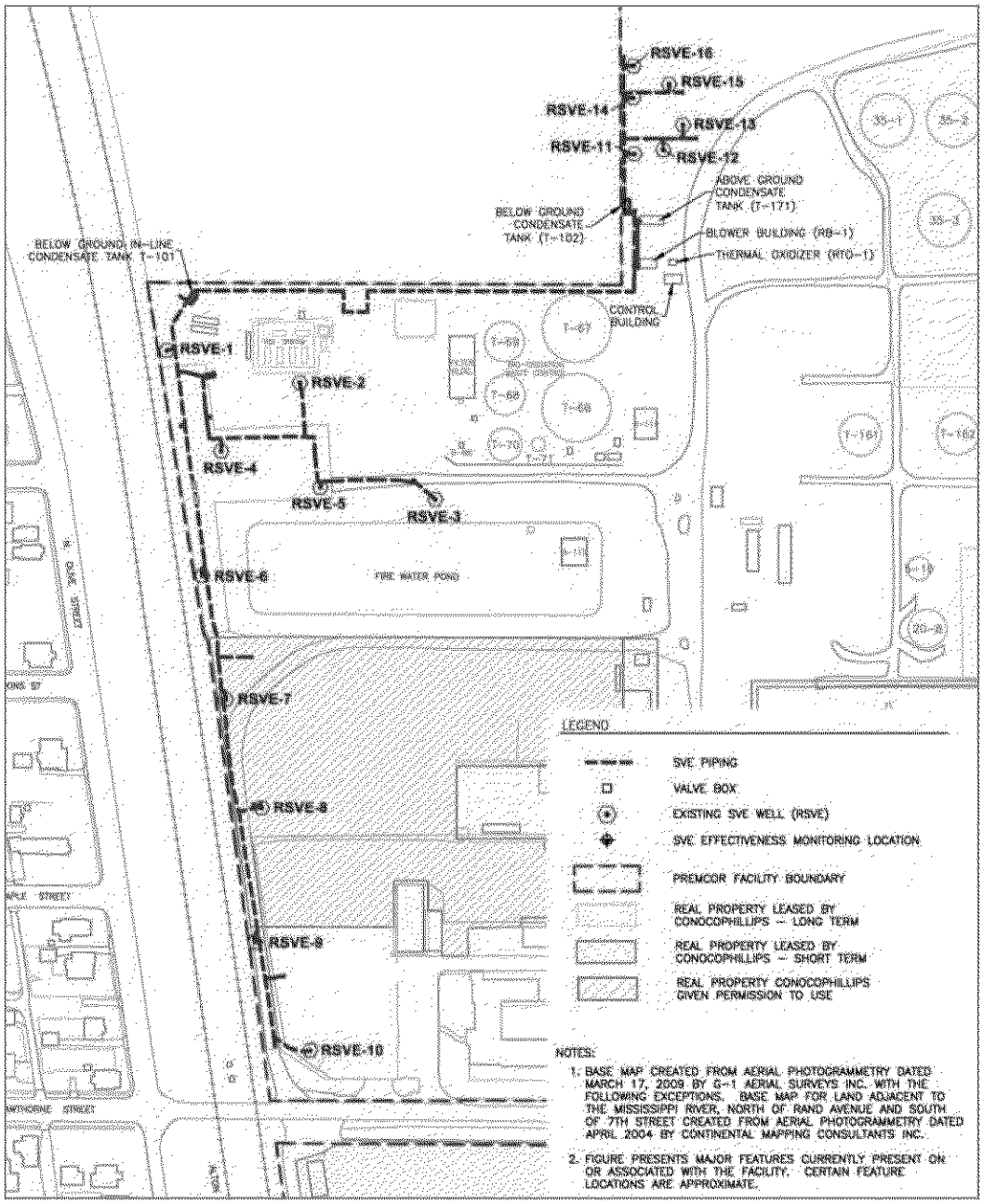


Figure 7 Map identifying location of the SVE system. Pneumatic control is provided by a temporary engineering control system designed to remove hydrocarbon mass and to control off-site transport of vapor-phase COCs. SVE wells that will no longer be operated include RSVE-2, RSVE-3, RSVE-5, RSVE-11, RSVE-12, RSVE-13, RSVE-14, RSVE-15, and RSVE-16. A notification to shutdown wells RSVE-11 through RSVE-16 has been submitted separately from this Strategic Plan in accordance with Section 4.4.2 of this Strategic Plan. This system is designed to be turned off when a system decision point in Table 9 is met, as described in Section 4.3.

Permanent natural controls at the Facility include:

- Natural source zone depletion (NSZD) and Natural Attenuation (NA) effectuating LNAPL body and dissolved-phase plume stability/degradation;
- Geologic heterogeneity and stratigraphic traps controlling LNAPL migration;
- Convergence zone hydraulics yielding LNAPL and dissolved-phase migration controls; and
- Natural low hydraulic conductivity soil caps limiting exposure and migration potential at ground surface.

Natural Source Zone Depletion and Natural Attenuation

NSZD is the sum of natural processes (volatilization, dissolution, and biodegradation) that deplete the source mass of LNAPL over time. NA refers to the natural processes that degrade contaminants in groundwater. These processes may include biodegradation; dispersion; dilution; sorption; volatilization; and chemical or biological stabilization, transformation, or destruction of contaminants. Both NSZD and NA have been ongoing at the Facility since the moment the releases occurred, but are now adopted into the Strategic Plan as a potential final remedy if implemented with the proper monitoring system. Both serve as natural controls by contributing to LNAPL body and dissolved-phase plume stability as well as reducing the mass, toxicity, mobility, volume, and/or concentration of LNAPL as a separate phase liquid or as dissolved- or vapor-phase constituents.

Stratigraphic Traps

As previously presented in reports and plans, the geology beneath the Main Facility consists of alternating fine-grained deposits (clay and silt) overlying more permeable strata consisting of silty sand to sand and gravel deposits (Figure 8). Further analysis of these deposits indicates the presence of lateral and vertical textural variations and heterogeneity, based on an evaluation of boring logs, geotechnical data, and CPT data (i.e., soil index values and soil behavior types). These textural variations and heterogeneities within the subsurface deposits limit the vertical (i.e., stratigraphic traps) and lateral extent and migration of LNAPL in the subsurface.

Stratigraphic traps are high points in the bottom of low permeability layers that serve as the confining surface. When there are sufficient LNAPL saturations, mobile LNAPL under confined conditions redistributes locally both laterally and vertically within areas of higher elevation of the bottom of the confining surface. These high points in the bottom of the low permeability layer form traps, where the LNAPL enters, but cannot exit while confined. Stratigraphic traps are present beneath the B/C Clay (Figure 8) that support LNAPL body stability along the WPB and within the Main Facility.

Convergence Zone

The EPA Stratum is separated from the Main Sand by the D Clay (Figure 8). Downward flow of water is impeded by the D Clay, which creates a groundwater mound in the EPA Stratum on top of the D Clay. The mound is oriented northwest and southeast and groundwater flows off the flanks of this mound. The locations where flow from the EPA Stratum meets the groundwater flow in the Main Sand are called the groundwater convergence zones (GWCZs). Groundwater flow convergence occurs along the western, southern, and eastern margins of the D Clay (Figure 6). The extent and orientation of the GWCZs depend on river stage, what production wells are in operation, and groundwater flow trends.

LNAPL from nearby source areas tends to accumulate and become trapped within the GWCZs. The GWCZs restrict migration of LNAPL and dissolved-phase hydrocarbons. Furthermore, the presence of the GWCZs supports LNAPL body and dissolved-phase stability along the WPB and within the Main Facility.

Low Hydraulic Conductivity Soil Caps

The upper-most geologic unit is the A Clay (Figure 8). This low-permeability layer consists of silty clay to clayey silt and serves as a natural cap that reduces the potential for vertical transport of vapor-phase constituents to the ground surface.

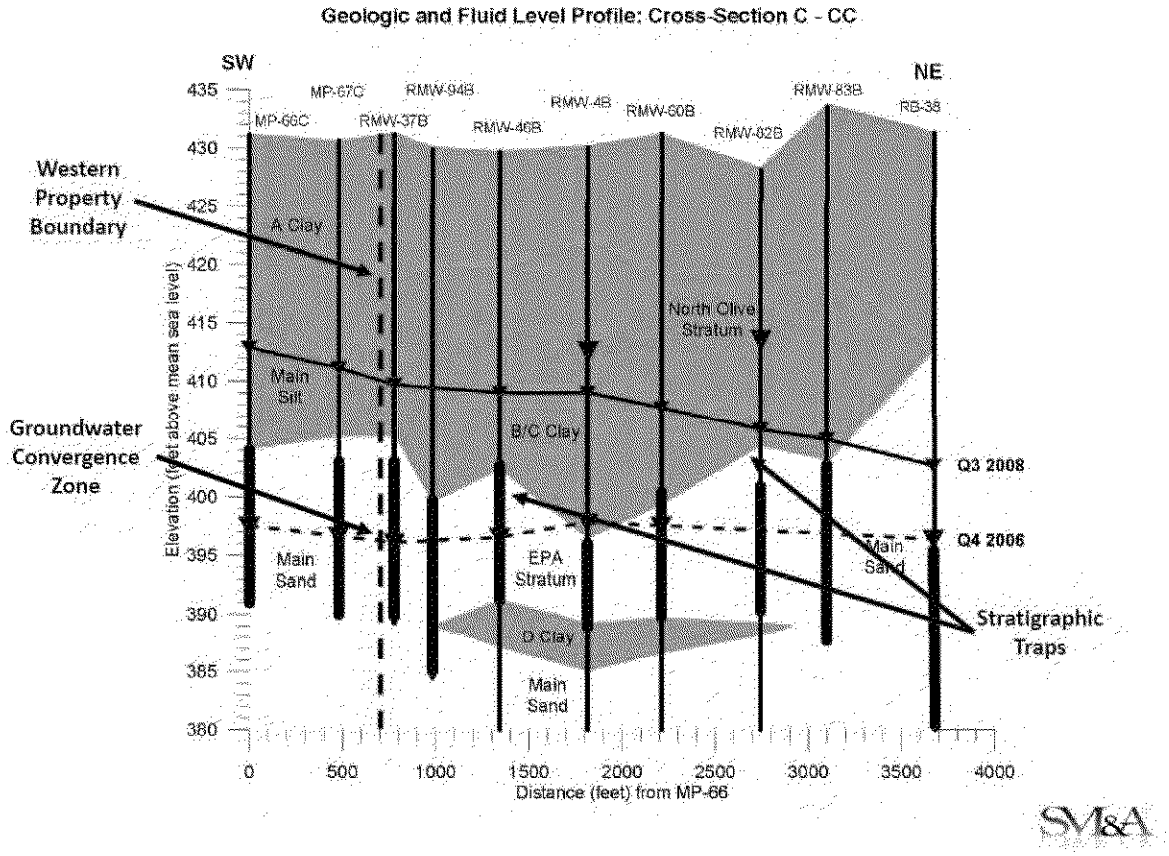


Figure 8 Generalized cross-section demonstrating the natural controls present at the Facility. The cross-section location is shown in Figure 6. The groundwater surfaces from the third quarter of 2008 (Q3 2008) and the fourth quarter of 2006 (Q4 2006) represent the historical maximum and minimum surfaces observed since monitoring began in 2003. The natural controls contribute to maintaining LNAPL body and dissolved-phase plume stability as well as preventing complete exposure routes for vapor-phase COCs.

Institutional controls currently in place at the Facility include:

- Deed restriction for the eastern portion of the property (CRM 1998);
- Groundwater ordinance in place for the Village of Hartford (Village of Hartford 2011);
- Site security fencing to restrict access and, where necessary, no trespassing signs are posted. Guards are stationed at select areas to limit access and video surveillance is in use where necessary; and
- Permitting system in place to restrict site access and subsurface disturbance.

The natural controls, institutional controls, and engineered systems are designed to control exposure routes to receptors. The engineered systems will operate until such time that site data demonstrate the institutional and natural controls are sufficient on their own to protect

human health and the environment as a final remedy. Illinois EPA approval will be required to transition to natural controls only with no active corrective action.

2.2.2 Remedies

Temporary remedies implemented at the Facility to address a perceived imminent and substantial threat to human health and the environment, and that control migration, remove hydrocarbon mass, and effectuate compositional change include:

- Hydraulic LNAPL removal (skimmer pump recovery [SPR] and total fluids extraction [TFE]);
- Multiphase LNAPL removal (vacuum-enhanced total fluids extraction); and
- SVE LNAPL removal.

The current hydraulic and multiphase remedy systems are shown in Figure 9.

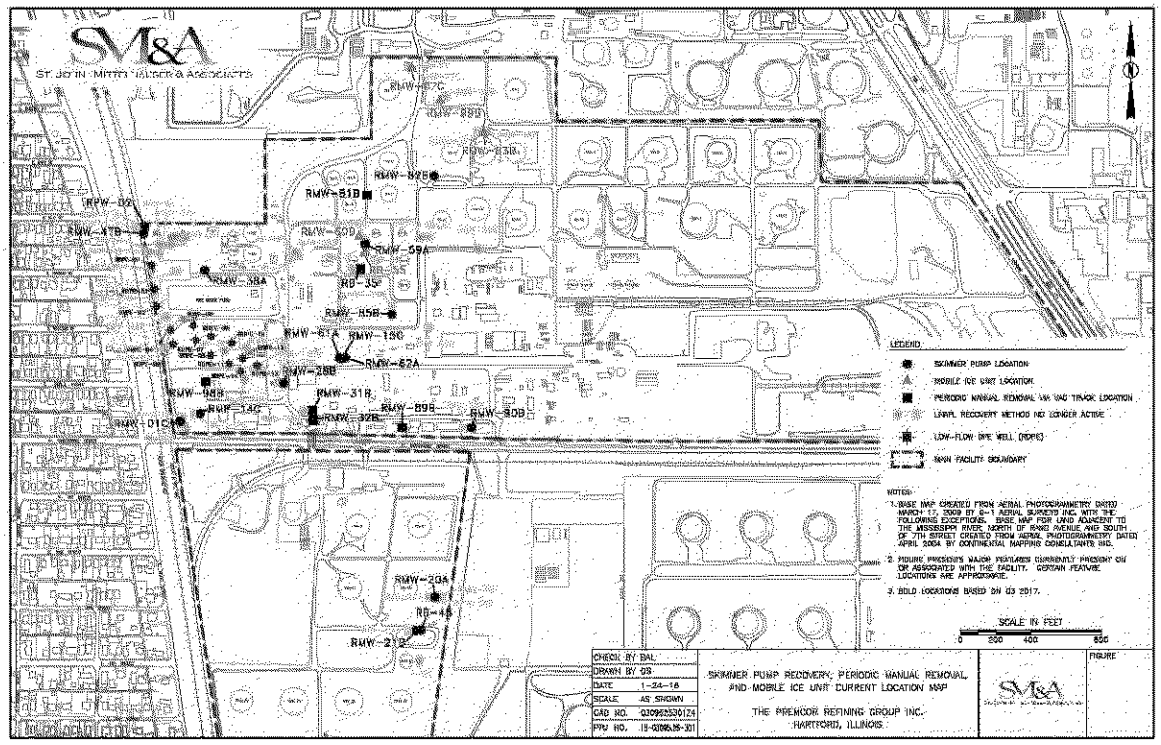


Figure 9 Map identifying the location of the current hydraulic and multiphase LNAPL remedies (see full size figure following the text). The SVE system is shown in Figure 7.

The goal of these temporary remedies, as adopted in this Strategic Plan, is to reach diminishing returns decision points for hydrocarbon removal such that more permanent natural degradation remedies, such as monitored natural source zone depletion (MNSZD) and monitored natural attenuation (MNA), become the most effective and efficient remediation processes.

The engineered (presumptive) remedies that have been demonstrated to be effective at the Facility include:

- SPR
- Multiphase Extraction (MPE)
- SVE
- TFE
- Periodic Manual Recovery (PMR)
- GWE
- Excavation

These remedies, including the definition of their decision points to identify the point of diminishing returns, were initially implemented following the multi-stage design process specified in the current draft Consent Order (2007). That work was critical in developing the detailed site and remedy knowledge that subsequently allowed the remedies adopted in this Strategic Plan to be implemented more efficiently on a proactive basis to obtain a permanent remedy as reflected in the recovery data summarized in Figure 10. This evolution from initial multi-stage design to subsequent presumptive remedy implementation and transition to final remediation is a critical ASM process upon which the corrective action approach specified in this Strategic Plan is based. The principles of ASM are described in more detail in the Working Process section (Section 4).

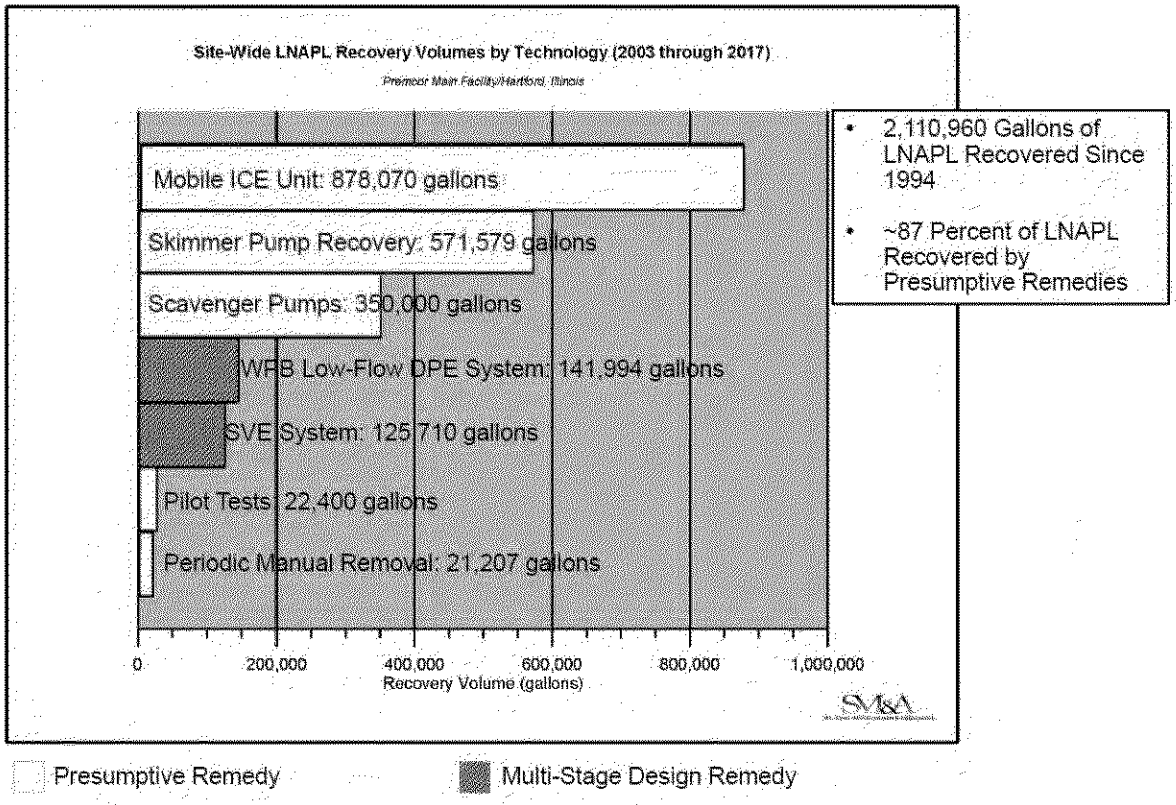


Figure 10 Comparison of the cumulative volume of LNAPL recovered via each presumptive technology through 2017. LNAPL recovered via systems designed and installed via the multi-stage design remedy process in the draft Consent Order (2007) are identified in hatching.

Following completion of corrective measures required by Illinois EPA in this Strategic Plan, to the metrics specified in Table 2 through Table 9 in Section 4.3, permanent remedies that will achieve any remaining CAOs over time will only include:

- MNSZD; and
- MNA.

Both NSZD and NA processes have been ongoing at the Facility since the moment the releases occurred, and are now adopted by this Strategic Plan in conjunction with quantification and monitoring requirements as acceptable final remedies for site remediation. The terms MNSZD and MNA refer to utilizing these natural processes as a deliberate remedy, including monitoring their rates and effectiveness. While screening analyses, summarized in Figure 11 and Figure 12, document that NSZD and NA are ongoing, only some of the rates have been quantified to date. A technology demonstration to determine the best monitoring approach is ongoing, with the initial assessment outlined in the *Technical Memo for MNSZD Initial Assessment Scope and Approach* (GEI 2018b), included as Appendix A5. Potential methodologies for quantitative monitoring in the future are presented in Section 4.4.1. The results of the technology demonstration analysis will be utilized to

identify the most effective methodology for long term MNSZD at the Facility. A plan will be developed for this methodology to collect sufficient information to characterize NSZD rates over time. The results of these studies will be documented in a workplan to quantify plume scale NSZD and NA rates that will be submitted as a preapproval report (Section 4.4.2). NSZD and NA screening results are shown in Figure 11 and Figure 12, respectively. The results indicate that NSZD processes are ongoing substantially at the Facility. The majority of the measurements indicate anaerobic or anaerobic transitional conditions, which indicates that the available oxygen has been depleted and methanogenesis is the primary mechanism for NSZD. In certain locations aerobic respiration was ongoing, indicating greater presence of oxygen.

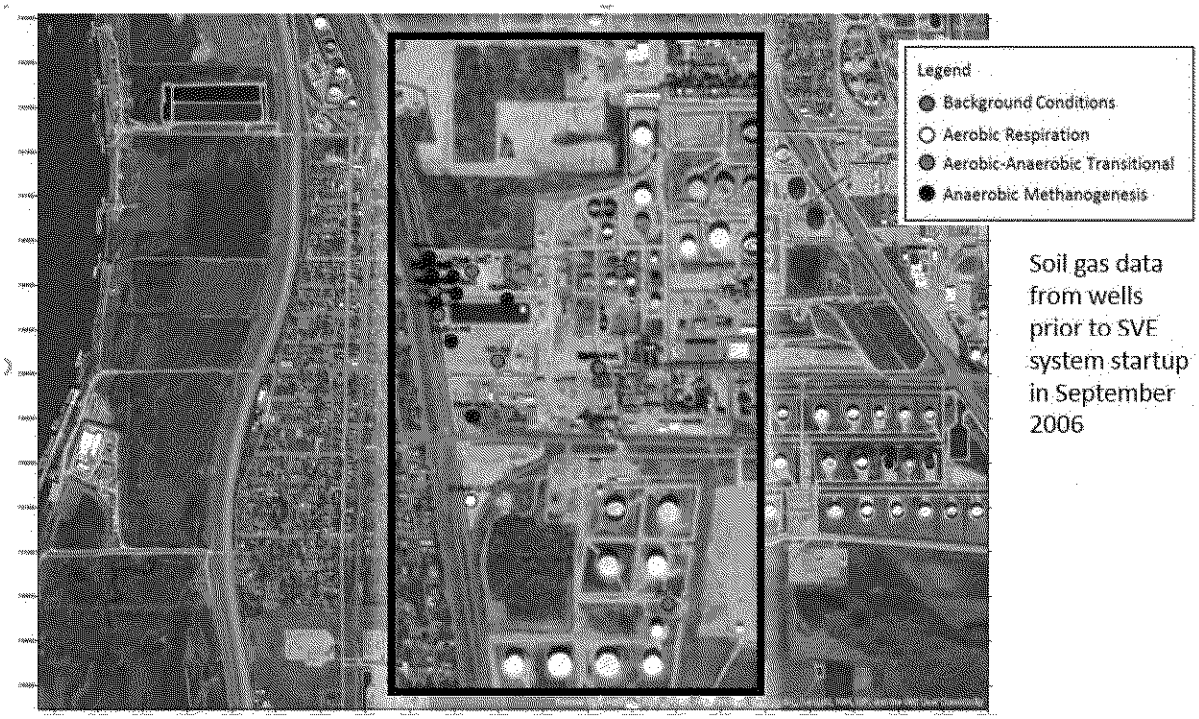


Figure 11 NSZD screening results in the EPA Stratum and Main Sand from soil gas data collected prior to the SVE system start-up in September 2006.

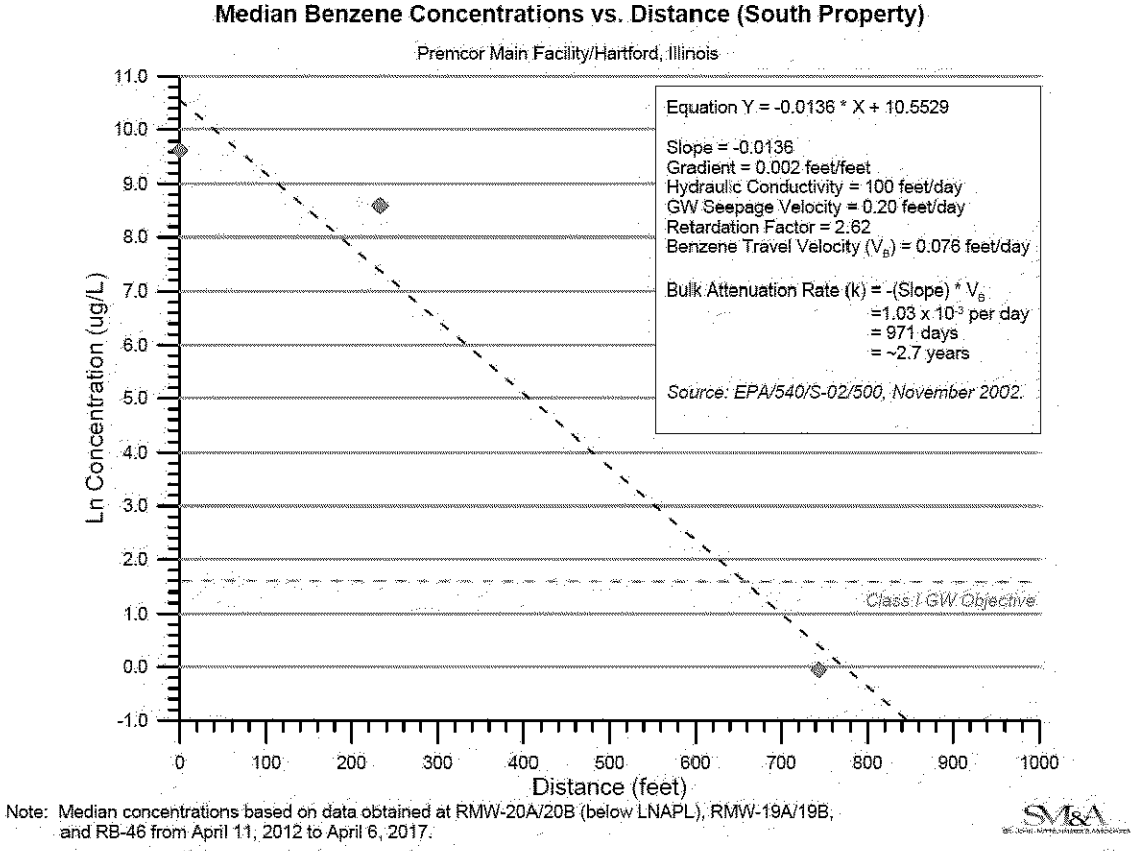


Figure 12 NA evaluation of benzene on the SP via the Concentration versus Distance method. The results indicate NA processes are ongoing substantially at the Facility.

2.3 CURRENT SITE CONDITIONS

2.3.1 LNAPL Body and Dissolved-Phase Plume Stability

Extensive monitoring of the LNAPL occurrence as well as dissolved-phase concentrations site-wide indicate that the LNAPL body and dissolved-phase plumes are stable based on current and historical known operating conditions. The overall evaluation is based on the:

- Extent of LNAPL occurrence in wells over time;
- Behavior of the LNAPL with respect to fluctuating groundwater conditions;
- Structure contour of the stratigraphic confining layer surfaces;
- Hydraulic gradient;
- Extent of dissolved-phase COCs exceeding a groundwater CAO over time;
- Dissolved-phase concentration trends in individual wells;
- Dissolved-phase plume center of mass calculations; and
- Dissolved-phase plume concentration trends (Figure 13).

The preponderance of evidence from all of these lines of evidence indicate that both the LNAPL body and dissolved-phase plumes are stable or decreasing. Table 2 and Table 5 provide the metrics to evaluate stability.

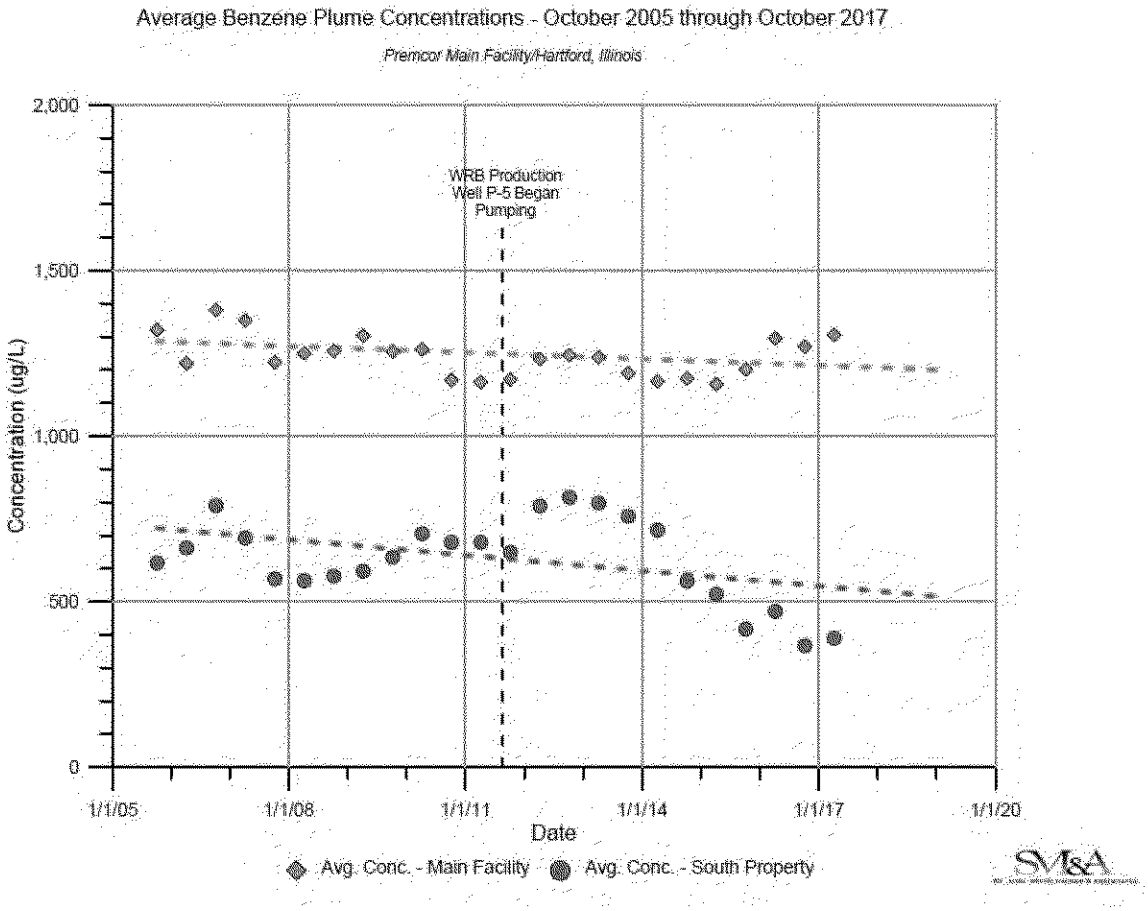


Figure 13 Average dissolved-phase benzene concentrations within the Main Facility and SP plumes. The Main Facility plume average concentration (diamonds) is stable. The SP plume average concentration (circles) is decreasing.

2.3.2 Current Condition of each Area of the Facility and System Status Relative to Decision Points

The five areas at the Premcor Facility are depicted on Figure 14 and include (1) Partial Closure Area Main Facility East (PCA MFE), (2) Partial Closure Area South Property (PCA SP), (3) Partial Closure Area River Dock Area (PCA RDA), (4) Deferred Area, and (5) the remaining areas to be addressed. Each area will be or has been evaluated for the following exposure routes: Soil Ingestion; Groundwater Ingestion; Outdoor Inhalation; and Indoor Air Inhalation. Evaluation has or will involve comparing COC results and developing CAOs for Illinois EPA approval. CAORs have been submitted for PCA MFE, PCA SP, and PCA RDA and are awaiting review and approval from the Illinois EPA. CAORs for other areas will be developed as conditions warrant. Table 1 provides a matrix summarizing the status of exposure route evaluations as part of the CSM.

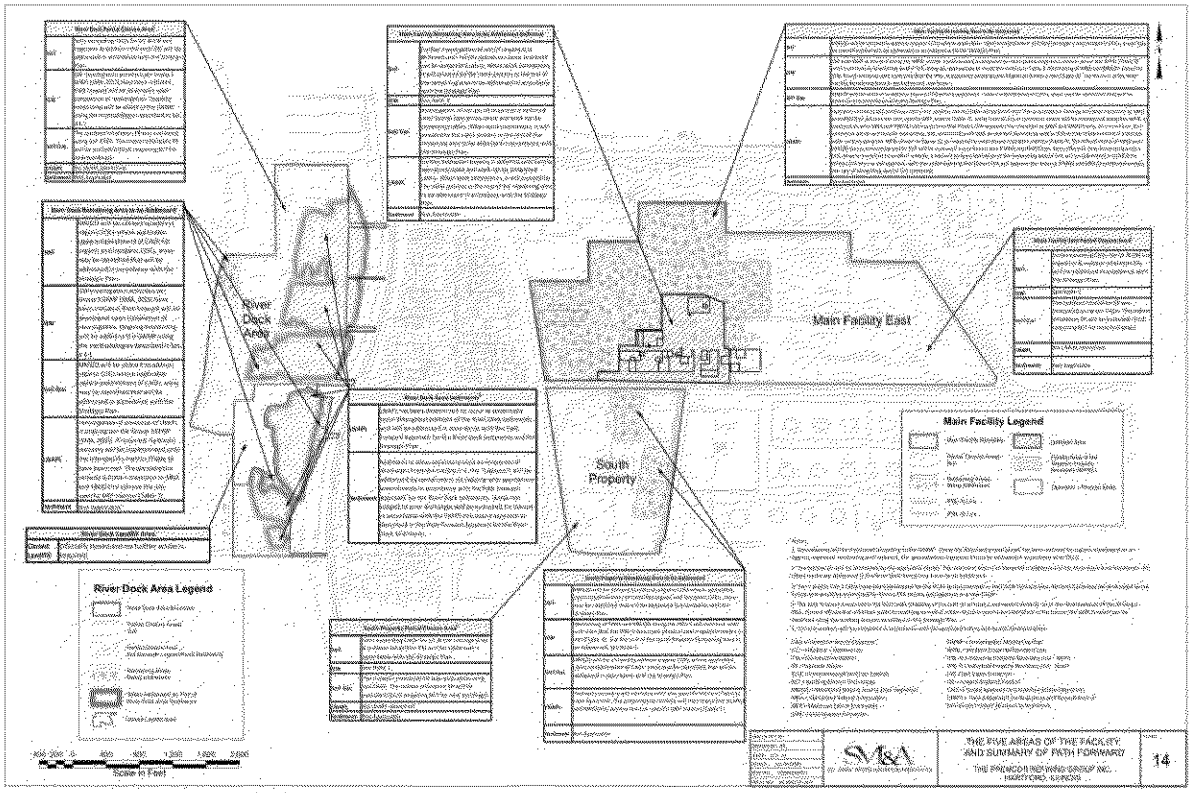


Figure 14 The five areas of the Facility and summary of path forward. See Table 1 for the current status of each media and exposure route by area.

Area	Media	Exposure Routes				
		Soil Ingestion	GW Ingestion	Outdoor Inhalation	Indoor Air Inhalation	Sediment and Ecological Exposure
PCA Main Facility East	Soil	C	E	C	---	---
	Groundwater	---	E	---	C	---
	Soil Gas	---	---	---	E	---
PCA South Property	Soil	C	E	C	---	---
	Groundwater	---	E	---	C	---
	Soil Gas	---	---	---	E	---
PCA River Dock Area	Soil	C	DN	C	---	---
	Groundwater	---	DN	---	DN	---
	Soil Gas	---	---	---	E	---
Remaining Areas to be Addressed	Soil	C[1]	E	C[1]	---	---
	Groundwater	---	E	---	E	---

Area	Media	Exposure Routes				
		Soil Ingestion	GW Ingestion	Outdoor Inhalation	Indoor Air Inhalation	Sediment and Ecological Exposure
	Soil Gas	---	---	---[1]	E[1]	---
Deferred Area	Soil	C[1]	E	C[1]	---	---
	Groundwater	---	E	---	E	---
	Soil Gas	---	---	---[1]	E[1]	---
River Dock Area Sediments	LNAPL	---	---	---	---	DN(AC)
	Sediment	---	---	---	---	DN(T), DN(AC)

Key

C	TACO Tier 1/Tier 2 evaluation completed and CAOs developed
C[1]	TACO Tier 1 evaluation completed
DN	Data needs
DN(T)	Data needs for Tier 3 TARPS risk-based evaluation
DN(AC)	Data needs for containment/amended capping remedy evaluation
E	Exposure route will be excluded
E[1]	Exposure route will be excluded based on additional investigation or building control technology
---	Exposure route not applicable
---[1]	Exposure route will be evaluated using soil data

Table 1 Summary of the status of the exposure route evaluation at each of the five areas of the Facility.

Soil

The June 30, 2006 *Site Wide Soil Investigation Work Plan* consolidated the areas of the Facility originally described in the April 28, 2003 *Current Conditions Report* into four groups (Group 1 through Group 4) to be investigated sequentially. The Work Plan was conditionally approved by the Illinois EPA on September 19, 2006. Each of the investigations has been completed and submitted to the Illinois EPA. The Group 1 and 2 reports have been approved by the Illinois EPA with conditions. There is open correspondence regarding the Group 3 and 4 reports between Premcor and the Illinois EPA. In addition, the October 29, 2015 *Group 3 Groundwater Investigation Work Plan* has been approved by the Illinois EPA and Premcor is waiting on comment back from the Wood River Drainage and Levee District as well as the Army Corps of Engineers on its notification of intent to conduct further groundwater investigation, including the installation of monitoring wells within the flood plain of the Mississippi River before proceeding.

The soil investigations contributed to the development of the CSM and provided a basis for the development of corrective action objectives for the PCAs and in the future for other areas of the Facility. Site-wide soil CAOs have not been proposed to date. Therefore, a comprehensive comparison of the investigation results to soil remediation objectives (SROs) has not been performed. However, certain areas were identified as low-risk and CAOs have been developed, and partial closure is being sought for these areas, shown in Figure 5.

Groundwater

Due to potential migration threats and the Facility's hydrogeological conditions, the WPBL was identified as a priority area for groundwater management and initial response. Groundwater is currently managed at the Facility via GWE along the WPBL. Groundwater concentrations have been monitored according to the *Groundwater Monitoring Plan (Rev 3)* (SMA 2013a).

The anticipated strategy to address the groundwater ingestion exposure route is to exclude the groundwater route via institutional controls. A groundwater ordinance is already in place for the Village of Hartford, which addresses any potential off-site impacts. This ordinance covers an area from Hawthorne Street northward and beyond Rand Avenue and between the Mississippi River and State Route 111. Where necessary, an environmental land use control (ELUC) would be put in place on properties outside of this ordinance boundary. Implementing this strategy will require meeting all requirements to exclude this exposure route as defined under TACO.

Soil Gas

Soil gas investigations were previously scheduled to take place upon approval of all the soil investigation group reports. The site-wide soil gas investigations have not been initiated to date. Evaluation of soil gas will be conducted in accordance with TACO.

An SVE system is operated in the WPB to reduce the potential for vapor migration across the WPBL by enhancing LNAPL recovery. This system has been in operation since 2006. Hydrocarbon removal is ongoing and continues to effectively reduce the potential for vapor migration across the WPBL.

LNAPL

The *Basis of Design Report for Site Wide Management of Free Product* (SMA 2012a) was conditionally approved by the Illinois EPA; however, the Illinois EPA did not approve the proposed metrics to represent the maximum extent practicable (MEP) to recover the LNAPL. In a letter received by Premcor from the Illinois EPA, dated August 27, 2015, the Illinois EPA stated that 35 Illinois Administrative Code Part 742 (also known as TACO) contains no numerical standards specific to the removal of LNAPL to the MEP. Per the Illinois EPA's direction, Premcor moved on to submitting a Final Design report for sequential Districts of

the Facility as defined in the Basis of Design Report without clear direction as to the final metrics necessary to develop a final remedial action approach with requisite certainty as it is now addressed in this Strategic Plan. There is open correspondence between Premcor and Illinois EPA on the first of these reports (LNAPL Districts 1A and 1B).

Open correspondence is also ongoing between Premcor and Illinois EPA to develop site-specific decision points for LNAPL. The final consensus-based hydraulic recovery decision points and metrics defining recovery of LNAPL to the hydraulic recovery decision point and to the MEP, specific to the Facility, are specified in Table 6 and Table 7, respectively. These decision points are integral to implementing the final remedy in this Strategic Plan. LNAPL recovery operations will continue at the Facility until such time that these hydraulic recovery decision point metrics have been attained, at which point MNSZD will be implemented to achieve further degradation of LNAPL to the MEP.

Ongoing LNAPL recovery operations include:

MPE – MPE has been implemented through the low-flow dual-phase extraction (LFDPE) system in the WPB as well as in various wells using a mobile internal combustion engine (ICE) unit. The LFDPE system was operated until the liquid recovery reached the point of diminishing returns. It currently operates in SVE mode only. The mobile ICE unit has been operated at multiple wells.

SPR – SPR has been implemented in multiple wells. With the exception of SPR operation in monitoring well RMW-38A, the pumps are operated and relocated according to site conditions.

TFE – MPE and SPR have been identified to be the most effective hydraulic LNAPL remedies at the Facility. However, TFE is performed at wells where water production is the primary well purpose as part of the IGC system, but LNAPL also accumulates in the well as a less efficient by-product of gradient control pumping.

PMR – MPE and SPR have been identified to be the most effective hydraulic LNAPL remedies at the Facility. However, PMR has historically been performed at select wells.

Detailed information concerning system operations, including historical annual LNAPL removal volumes, can be found in progress status reports submitted to the Illinois EPA.

Sediment

Impacted sediment is present in portions of the lagoons and ponds within the RDA. Investigations into the pond and lagoon sediments were conducted as detailed in the *Group 3 Soil Investigation Report* (SMA 2012 b). The data and results from those investigations was revisited in the *Path Forward Approach for the River Dock Area Sediments, Premcor*

Facility (GEI 2018a), pending submittal and included as Appendix A3. This document evaluates existing data, identifies potential data gaps, and proposes approaches to addressing sediment remedial needs.

3. FUNDAMENTALS FOR SUCCESS

As described above, Premcor and Illinois EPA have made tremendous progress in characterizing the Facility and implementing appropriate initial response actions to address perceived imminent and substantial threats and protect human health and the environment. This Strategic Plan presents a final remediation plan that incorporates prior work into a coordinated remedy with more certain remediation goals. As the investigations and remedies adopted in this Strategic Plan continue to progress the Facility to closure, opportunities have been identified to improve consistency, efficiency, and certainty in the corrective action process. Identifying and implementing these opportunities will reduce the burden on both Illinois EPA and Premcor and allow for the most effective use of resources moving forward.

3.1 CONSISTENCY

This Strategic Plan provides a process based on extensive Facility knowledge that will:

- Protect human health and the environment;
- Be consistent with Illinois regulations and guidance; and
- Incorporate ASM to implement flexibility inherent within TACO and other applicable rules and regulations.

With the exception of ASM, these elements are in place in the current corrective action process based on the draft Consent Order (2007) and will remain for all remediation activities undertaken as part of this Strategic Plan. ASM is an approach in which policies and remedies are implemented based on the best available data, and the response is monitored, interpreted, and used to adjust programs in an iterative manner, leading to ongoing improvements in knowledge and performance (ITRC 2017). Appendix A1 shows work from the current draft Consent Order (2007) Appendices B and C and how each of these elements are addressed in this Strategic Plan.

3.2 EFFICIENCY

This Strategic Plan will lead to greater efficiency in protecting human health and the environment by building on past successes and extensive site knowledge to:

- Streamline and potentially accelerate investigation/remediation activities, and
- Streamline reporting.

Greater efficiency will reduce the administrative burden on both Premcor and the Illinois EPA and allow for the most effective use of resources, while also potentially accelerating implementation of appropriate corrective actions.

3.3 CERTAINTY

This Strategic Plan will create greater certainty in the remedial process by eliminating uncertainty in the site-specific elements as they pertain to remedial implementation, and capitalizing on the flexibility inherent within TACO and other applicable rules and regulations. This Strategic Plan aims to define in specific, quantifiable language these site-specific elements. Where that is not possible, a process is defined to incorporate additional elements in the future.

Greater certainty in remedial endpoints is particularly critical in selecting the appropriate presumptive remedy(ies) as well as in preparing cost estimates to advance the Facility to closure. No final remedial action could be conducted with the requisite certainty and finality without developing these remedial endpoints. Cost is not the most critical deciding factor in identifying the appropriate presumptive remedy(ies) and associated decision points or endpoints in the corrective action process. However, certainty on cost estimates to remediate the Facility is the critical hurdle in agreements between Premcor, the State of Illinois (IAGO and Illinois EPA), and third parties. Finalizing these settlement agreements would increase the resources available for Facility remediation as well as improve the likelihood for Premcor and the State of Illinois (IAGO and Illinois EPA) to finalize a consent order for the Facility.

4. WORKING PROCESS

4.1 STRATEGIC PLAN

Figure 15 details the Strategic Plan process. Each media/route process to achieve closure is presented below.

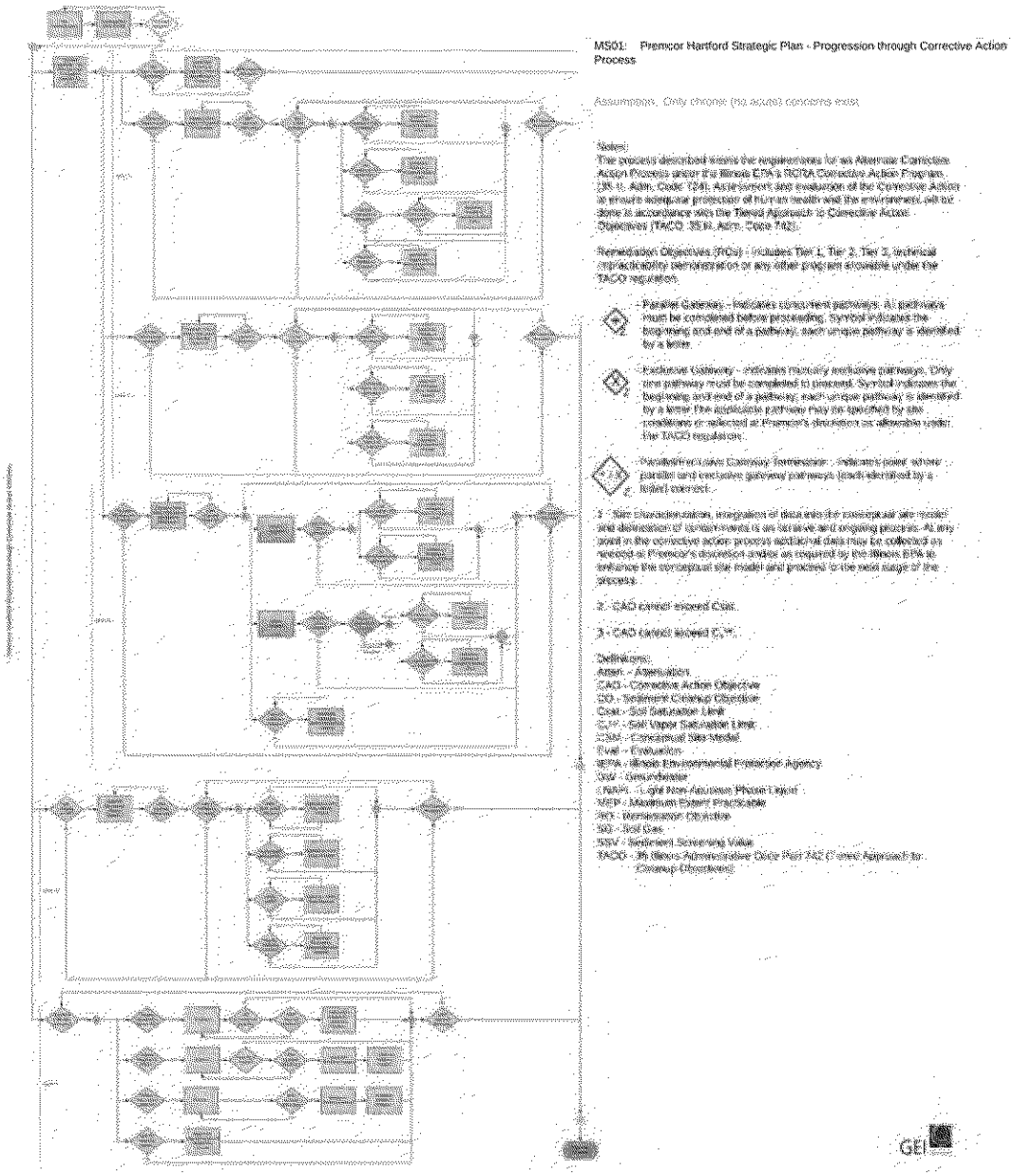


Figure 15 Overview of the Strategic Plan to complete the corrective action process (see full size figure following the text). While Illinois EPA approval is required to finalize CAOs, Premcor may implement remedies as described in this Strategic Plan on its own initiative prior to finalization of the CAOs.

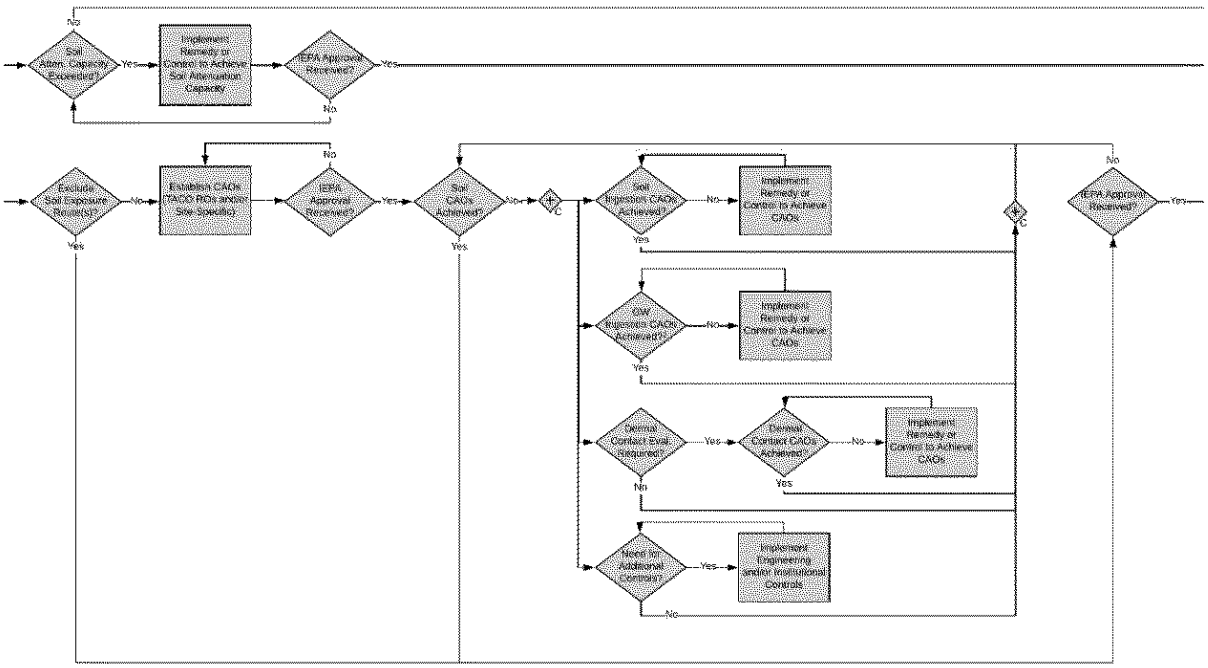
4.1.1 Process Description

The Strategic Plan begins with the continued development of the CSM, which was described above. Investigation activities will continue until delineation is complete and sufficient to develop risk-based CAOs (per TACO) for each media and exposure route. This process can be broken down by COC, areas of the Facility, hydrogeological delineations, or other categories as appropriate to facilitate sequential, partial closure of the Facility. Additional

details on the implementation of the strategic process are provided in the tactical plans in Section 4.2. A separate plan to address the sediment in the RDA will be submitted to Illinois EPA, and is included in Appendix A3. All media and exposure routes specified in TACO and appropriate to the Facility are addressed in this Strategic Plan. The evaluation of each media and exposure route can be undertaken concurrently, however, Illinois EPA approval of each must be attained before the response will be considered complete.

The process includes elements that can be addressed concurrently, but all must be addressed (inclusive evaluation, designated with + on the flow charts), as well as elements where only one element needs to be addressed (exclusive evaluation, designated with an X on the flow charts). These choices are described and defined in detail in TACO.

The process to achieve soil CAOs is provided in Figure 16. Laboratory analytical data for soil will be evaluated per TACO procedures and thresholds. If no CAOs are exceeded, the documentation will be provided to Illinois EPA for review and approval. If CAOs are exceeded, the associated exposure route(s) will be evaluated and addressed through a CAO technology, limited excavation, engineering control, and/or institutional control. The evaluation and implementation cycle will continue until the Facility data demonstrates that all Illinois EPA approved CAOs have been met or the exposure route in question excluded per TACO.



Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program (35 Ill. Adm. Code 724). Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).

Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, technical impracticability demonstration or any other program allowable under the TACO regulation.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

- Exclusive Gateway - Indicates mutually exclusive pathways. Only one pathway must be completed to proceed. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.The applicable pathway may be specified by site conditions or selected at Premcor's discretion as allowable under the TACO regulation.

- Parallel/Exclusive Gateway Termination - Indicates point where parallel and exclusive gateway pathways (each identified by a letter) connect.

1 - Site characterization, integration of data into the conceptual site model, and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion and/or as required by the Illinois EPA to enhance the conceptual site model and proceed to the next stage of the process.

2 - CAO cannot exceed Csat.

3 - CAO cannot exceed C_v^{sat}.

Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
CO - Sediment Cleanup Objective
Csat - Soil Saturation Limit
C_v^{sat} - Soil Vapor Saturation Limit
CSM - Conceptual Site Model
Eval. - Evaluation
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
LNAPL - Light Non-Aqueous Phase Liquid
MEP - Maximum Extent Practicable
RO - Remediation Objective
SG - Soil Gas
SSV - Sediment Screening Value
TACO - 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives)

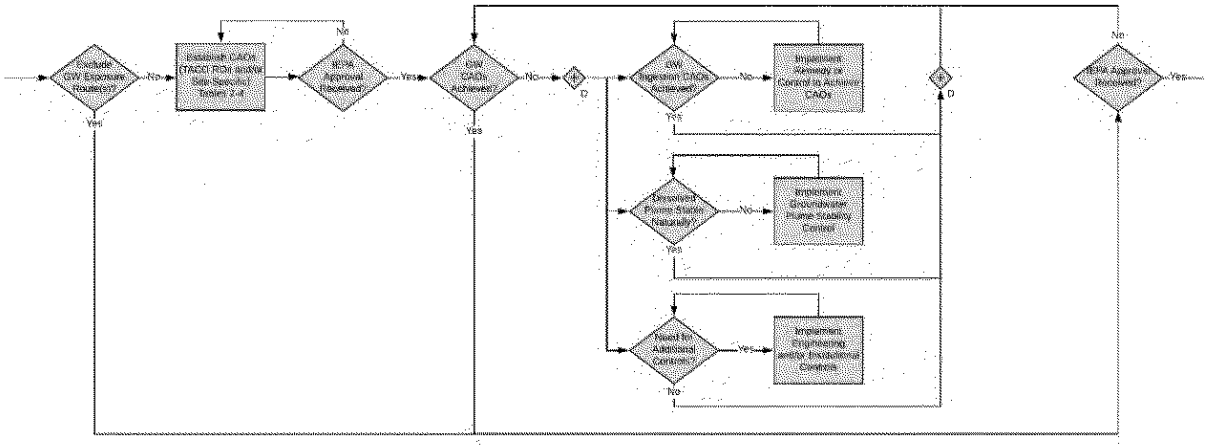
ST01. Premcor Hartford Tactical Plan - Soil

Assumption: Only chronic (no acute) concerns exist

Figure 16 Strategic process to achieve soil CAOs. While Illinois EPA approval is required to finalize CAOs, Premcor may implement remedies as described in this Strategic Plan on its own initiative prior to finalization of the CAOs.

The process to achieve groundwater CAOs under TACO is provided in Figure 17. Laboratory analytical data for groundwater will be evaluated per TACO procedures and thresholds. If no CAOs are exceeded, the documentation will be provided to Illinois EPA for review and

approval. If any CAOs are exceeded, each associated exposure route and CAO with exceedances will be evaluated and addressed through a CAO technology, a groundwater stability control technology, engineering control, and/or institutional control. The evaluation and implementation cycle will continue until the Facility data demonstrates that all required CAOs have been met or the exposure route in question is excluded per TACO.



Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program (35 Ill. Adm. Code 724). Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).

Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, technical impracticability demonstration or any other program allowable under the TACO regulation.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

- Exclusive Gateway - Indicates mutually exclusive pathways. Only one pathway must be completed to proceed. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.The applicable pathway may be specified by site conditions or selected at Premcor's discretion as allowable under the TACO regulation.

- Parallel/Exclusive Gateway Termination - Indicates point where parallel and exclusive gateway pathways (each identified by a letter) connect.

1 - Site characterization, integration of data into the conceptual site model, and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion and/or as required by the Illinois EPA to enhance the conceptual site model and proceed to the next stage of the process.

2 - CAO cannot exceed Csat.

3 - CAO cannot exceed C_v^{sat}.

Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
CO - Sediment Cleanup Objective
Csat - Soil Saturation Limit
C_v^{sat} - Soil Vapor Saturation Limit
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MEP - Maximum Extent Practicable
RO - Remediation Objective
SG - Soil Gas
SSV - Sediment Screening Value
TACO - 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives)

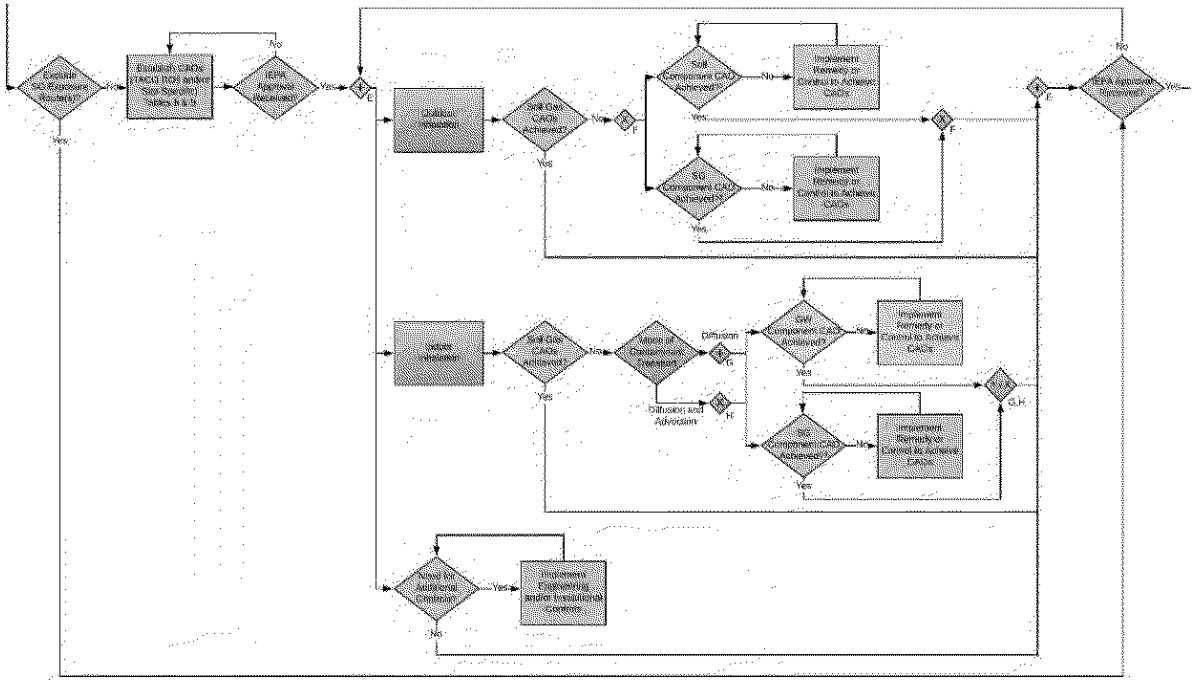
OTOL Premcor Hartford Tactical Plan - Dissolved Phase

Assumption: Only chronic (no acute) concerns exist

Figure 17 Strategic process to achieve GW CAOs. While Illinois EPA approval is required to finalize CAOs, Premcor may implement remedies as described in this Strategic Plan on its own initiative prior to finalization of the CAOs.

The process to achieve soil gas CAOs under TACO is provided in Figure 18. Laboratory analytical data for soil, soil gas, and groundwater will be evaluated per TACO procedures and thresholds will be established for each exposure route where required. If no CAOs are

exceeded, the documentation will be provided to Illinois EPA for review and approval. If CAOs are exceeded in an exposure route, each exposure route and remediation objective with exceedances will be evaluated and addressed through a CAO technology, engineering control, and/or institutional control. The evaluation and implementation cycle will continue until the site data demonstrates that all required CAOs have been met or the exposure route in question is excluded per TACO.



Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program (35 Ill. Adm. Code 724). Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).

Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, technical impracticability demonstration or any other program allowable under the TACO regulation.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

- Exclusive Gateway - Indicates mutually exclusive pathways. Only one pathway must be completed to proceed. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.The applicable pathway may be specified by site conditions or selected at Premcor's discretion as allowable under the TACO regulation.

- Parallel/Exclusive Gateway Termination - Indicates point where parallel and exclusive gateway pathways (each identified by a letter) connect.

1 - Site characterization, integration of data into the conceptual site model, and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion and/or as required by the Illinois EPA to enhance the conceptual site model and proceed to the next stage of the process.

2 - CAO cannot exceed Csat.

3 - CAO cannot exceed C_v^{sat}.

Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
CO - Sediment Cleanup Objective
Csat - Soil Saturation Limit
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CSM - Conceptual Site Model
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SG - Soil Gas
SSV - Sediment Screening Value
TACO - 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives)

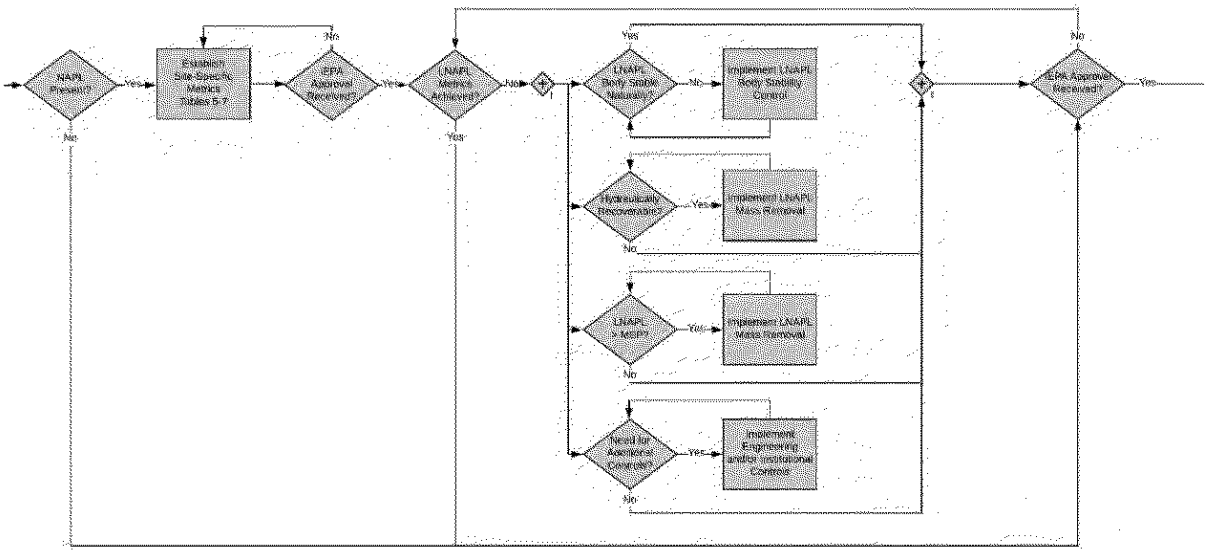
SG01. Premcor Hartford Tactical Plan - Vapor Phase

Assumption: Only chronic (no acute) concerns exist

Figure 18 Strategic process to achieve soil gas CAOs. While Illinois EPA approval is required to finalize CAOs, Premcor may implement remedies as described in this Strategic Plan on its own initiative prior to finalization of the CAOs.

The process to achieve LNAPL metrics under TACO is provided in Figure 19. LNAPL and groundwater gauging data, LNAPL transmissivity values, LNAPL and groundwater recovery data, and/or multiphase model derived values for LNAPL saturations and recovery potential

will be evaluated per TACO according to the LNAPL-specific metrics and thresholds established in this Strategic Plan. If all thresholds are met, the documentation will be provided to Illinois EPA for review and approval. If any thresholds are not met, each metric will be evaluated and addressed through an LNAPL mass removal technology, LNAPL body stability control technology, engineering control, and/or institutional control. The evaluation and implementation cycle will continue until all required metrics have been satisfied per TACO procedures and thresholds as specifically defined in this Strategic Plan.



Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program (35 Ill. Adm. Code 724). Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).

Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, technical impracticability demonstration or any other program allowable under the TACO regulation.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

- Exclusive Gateway - Indicates mutually exclusive pathways. Only one pathway must be completed to proceed. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.The applicable pathway may be specified by site conditions or selected at Premcor's discretion as allowable under the TACO regulation.

- Parallel/Exclusive Gateway Termination - Indicates point where parallel and exclusive gateway pathways (each identified by a letter) connect.

1 - Site characterization, integration of data into the conceptual site model, and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion and/or as required by the Illinois EPA to enhance the conceptual site model and proceed to the next stage of the process.

2 - CAO cannot exceed Csat.

3 - CAO cannot exceed C_v^{sat}.

Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
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LNAPL - Light Non-Aqueous Phase Liquid
MEP - Maximum Extent Practicable
RO - Remediation Objective
SG - Soil Gas
SSV - Sediment Screening Value
TACO - 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives)

NTGL Premcor Hartford Tactical Plan - NAPL

Assumption: Only chronic (no acute) concerns exist

Figure 19 Strategic process to achieve LNAPL in groundwater metrics. While Illinois EPA approval is required to finalize metrics, Premcor may implement remedies as described in this Strategic Plan on its own initiative prior to finalization of the metrics.

The process to achieve sediment cleanup objectives (COs) is presented in Figure 20. The sediment plan is included as a general overview. However, the details of the proposed path forward are included separately in the *Path Forward Approach for the River Dock Area Sediments, Premcor Facility* (GEI 2018a), included in Appendix A3.

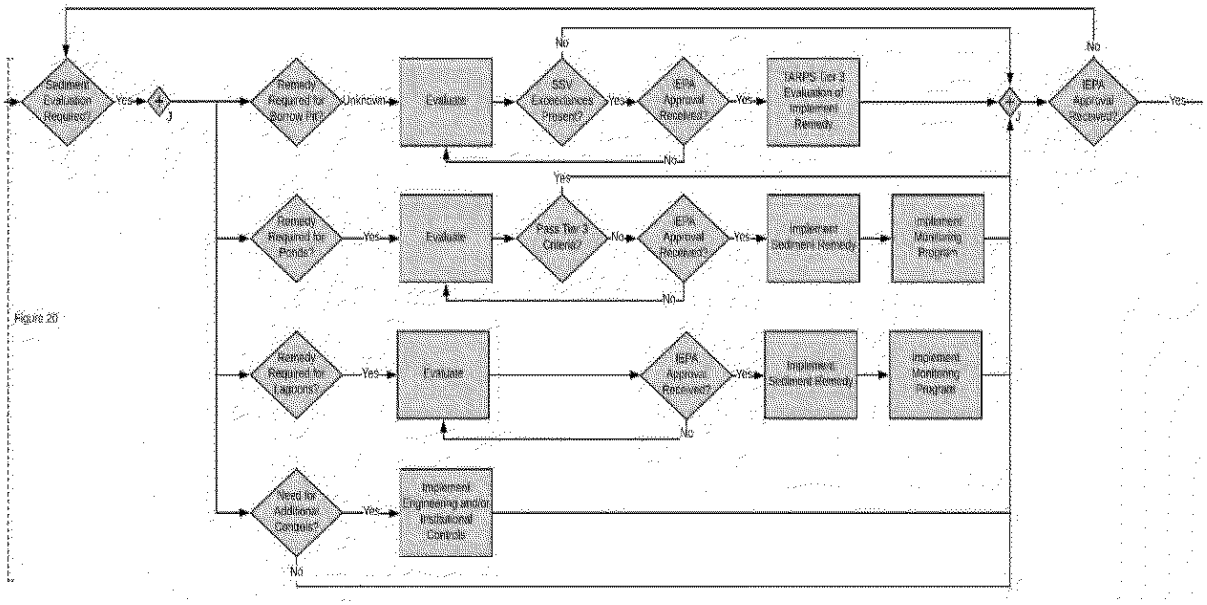


Figure 20

Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program (35 Ill. Adm. Code 724). Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).

Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, technical impracticability demonstration or any other program allowable under the TACO regulation.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

- Exclusive Gateway - Indicates mutually exclusive pathways. Only one pathway must be completed to proceed. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.The applicable pathway may be specified by site conditions or selected at Premcor's discretion as allowable under the TACO regulation.

- Parallel/Exclusive Gateway Termination - Indicates point where parallel and exclusive gateway pathways (each identified by a letter) connect.

1 - Site characterization, integration of data into the conceptual site model, and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion and/or as required by the Illinois EPA to enhance the conceptual site model and proceed to the next stage of the process.

2 - CAO cannot exceed Csat.

3 - CAO cannot exceed C_v^{sat}.

Definitions:
Atten. - Attenuation
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SG - Soil Gas
SSV - Sediment Screening Value
TACO - 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives)

SD01: Premcor Hartford Tactical Plan - Sediment

Figure 20 Strategic process to achieve sediment COs.

SR000684

4.1.2 Process Oversight

The Strategic Plan is a site-specific implementation of ASM. Traditionally, the corrective action process proceeds linearly from site investigation to CAO/metric development to remedy implementation to site closure. In ASM, the corrective action process is iterative. The knowledge gathered for the Facility is routinely integrated into the CSM and appropriate changes are cascaded through the remedy implementation to make the corrective action process more effective and efficient. In this way, ongoing initial response actions taken to address urgent needs at the site are incorporated into the Strategic Plan.

This Strategic Plan provides Premcor with the flexibility to make changes to remedy implementation based on the extensive CSM without Illinois EPA review and approval as long as the applicable changes do not negatively affect the off-site areas according to metrics outlined in Section 4.3. However, the remedies selected must be proven approaches for the Facility, as outlined in the following Tactical Plan with Presumptive Remedies section (Section 4.2). Introduction of new technologies would require a modification of this Strategic Plan to incorporate them (Section 4.5).

Premcor must continue to demonstrate progress toward the CAOs for the Facility as described in Section 4.2.2. Also, Illinois EPA must review and approve that all relevant science- and risk-based CAOs and site-specific metrics, which are developed in accordance with TACO and/or other guidance as approved by Illinois EPA, have been met before a corrective action is complete.

4.2 TACTICAL PLAN WITH PRESUMPTIVE REMEDIES

Tactical plans to provide detail on the implementation of the Strategic Plan (Section 4.1) for each media are presented below. The implementation will follow the general process of technology selection, design, construction, and operations and maintenance (O&M) as detailed in Figure 22 through Figure 25.

The presumptive remedies are the proven and demonstrated technologies used to achieve progress towards CAOs and metrics. Initial response actions that have proven to be effective at the Facility are incorporated into the Strategic Plan and adopted as presumptive remedies, along with other standard presumptive remedies, in the final remediation plan. Implementation of these remedies at the Facility does not require extensive investigation, evaluation, or pilot testing. With ASM, Premcor has the flexibility to implement any of these remedies as well as switch between them at any time without prior Illinois EPA approval to ensure the most effective and efficient remedy possible.

The presumptive remedies include:

- Excavation;
- Groundwater extraction (GWE);
- Monitored natural attenuation (MNA)[1];
- Monitored natural source zone depletion (MNSZD)[1];
- Bioventing[1];
- Multiphase extraction (MPE);
- Periodic Manual recovery (PMR);
- Skimmer pump recovery (SPR);
- Soil vapor extraction (SVE);
- Total fluids extraction (TFE); and
- Other remedies agreed upon by Illinois EPA and Premcor, to be defined through a modification report as described in Section 4.5.

The applicable presumptive remedies to meet each objective are identified in Figure 22 through Figure 25. Potential engineering or institutional controls and the possibility for excluding an exposure route of concern are not explicitly listed on the tactical plans. However, any control or exposure route exclusion or other approach that is allowed under TACO may be incorporated.

Some form of active corrective action will be maintained along the WPBL in conjunction with MNA and MNSZD until such time that Illinois EPA approves the transition to MNA and MNSZD only. At a minimum, this corrective action will include bioventing, SVE, and/or IGC with GWE as needed (GWE needs to be based on an analysis of historic data or demonstration via pilot testing in a preapproval report for Illinois EPA review and approval prior to cessation of GWE). IGC with GWE as needed along the WPBL will be implemented as required to meet plume migration metrics across the WPBL (Table 3) until such time as bioventing and/or SVE alone are appropriate to meet the metrics in Table 3. Bioventing and/or SVE will be implemented in a 50-foot wide section along the WPBL, shown in Figure 21, as required to meet plume migration metrics across the WPBL (Table 3). At the time that bioventing and/or SVE alone are appropriate to meet the metrics in Table 3, the IGC will cease operation and a corrective measures completion report (CMCR), demonstrating that off-site migration metrics in Section 4.3 are met, will be submitted for Illinois EPA review and approval.

[1] A preapproval workplan will be submitted for Illinois EPA review and approval prior to full-scale implementation of MNSZD and MNA, monitoring and implementation of bioventing along the WPBL, or controls proposed in CAORs.

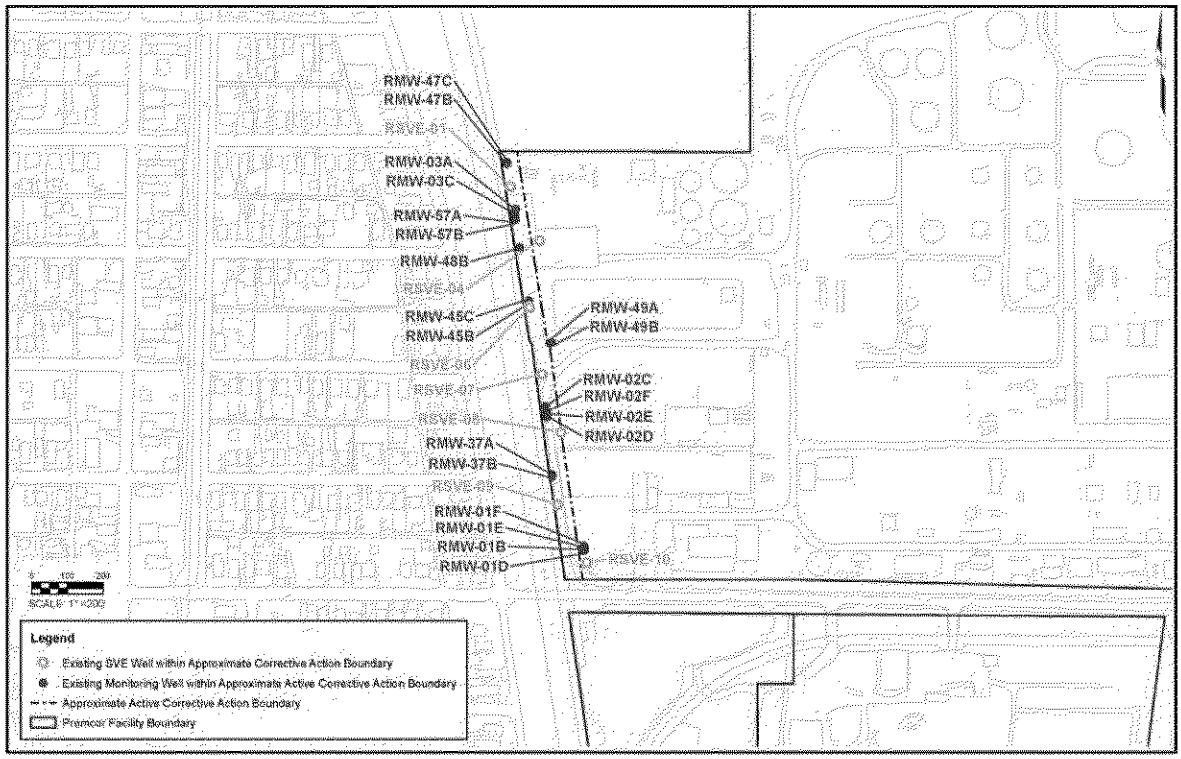


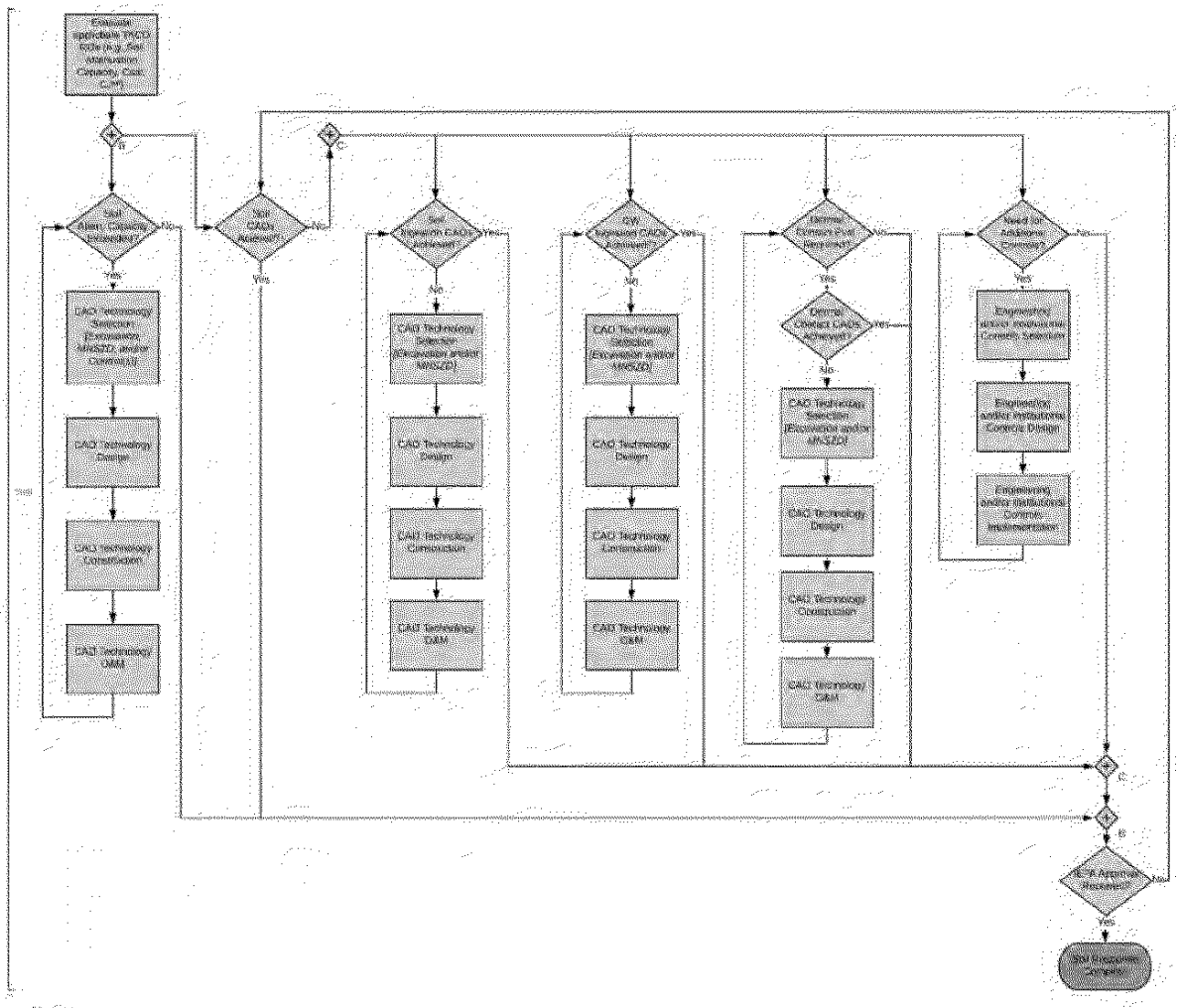
Figure 21 Active correction action boundary along WPBL and existing wells within the boundary. Bioventing and/or SVE will be implemented in an approximate 50-foot wide section along the WPBL, as required to meet plume migration metrics in Table 3.

The effectiveness of MNA and MNSZD versus bioventing and/or SVE will be reviewed every 5 years and documented in a five-year evaluation report (Section 4.4.2), and if MNA and MNSZD are more effective than bioventing and/or SVE, a request to cease operation of the bioventing and/or SVE will be submitted in a CMCR for Illinois EPA review and approval prior to shutdown of bioventing and/or SVE, with the understanding that Illinois EPA will approve the request if MNA and MNSZD combined exceed the rate of bioventing and/or SVE combined.

For areas of the Facility that cannot be safely accessed due to ongoing operations (i.e., WRB Refining's Distilling West, see the Deferred Remediation Area in Figure 5), investigation and corrective action will be postponed until operations have ceased and the area is safe for access and work. Potential migration of COCs out of the deferred areas will be monitored according to the Groundwater Monitoring Plan, as described in Table 10 and Table 11. The regulatory responsibility for contributing to contamination, existing or new, as a result of their releases, will be that of property owner and/or operator.

4.2.1 Process Description

The tactical plan detailing the process to be followed to implement the soil portion of the Strategic Plan (Figure 16) is presented in Figure 22.



Notes:
Additional presumptive remedies added in the future could also be considered to achieve the soil CAOs. The applicability of the additional remedies would be outline in the modification report.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Assumes exposure route will not be excluded and CAOs are established and approved by IEPA per the Strategic Plan (Figure 15).

2 - CAO cannot exceed Csat.

Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
Csat - Soil Saturation Limit
C_v^{sat} - Soil Vapor Saturation Limit
Eval. - Evaluation
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
LNAPL - Light Non-Aqueous Phase Liquid
MNSZD - Monitored Natural Source Zone Depletion
O&M - Operations and Maintenance

ST01: Premcor Hartford Tactical Plan - Soil

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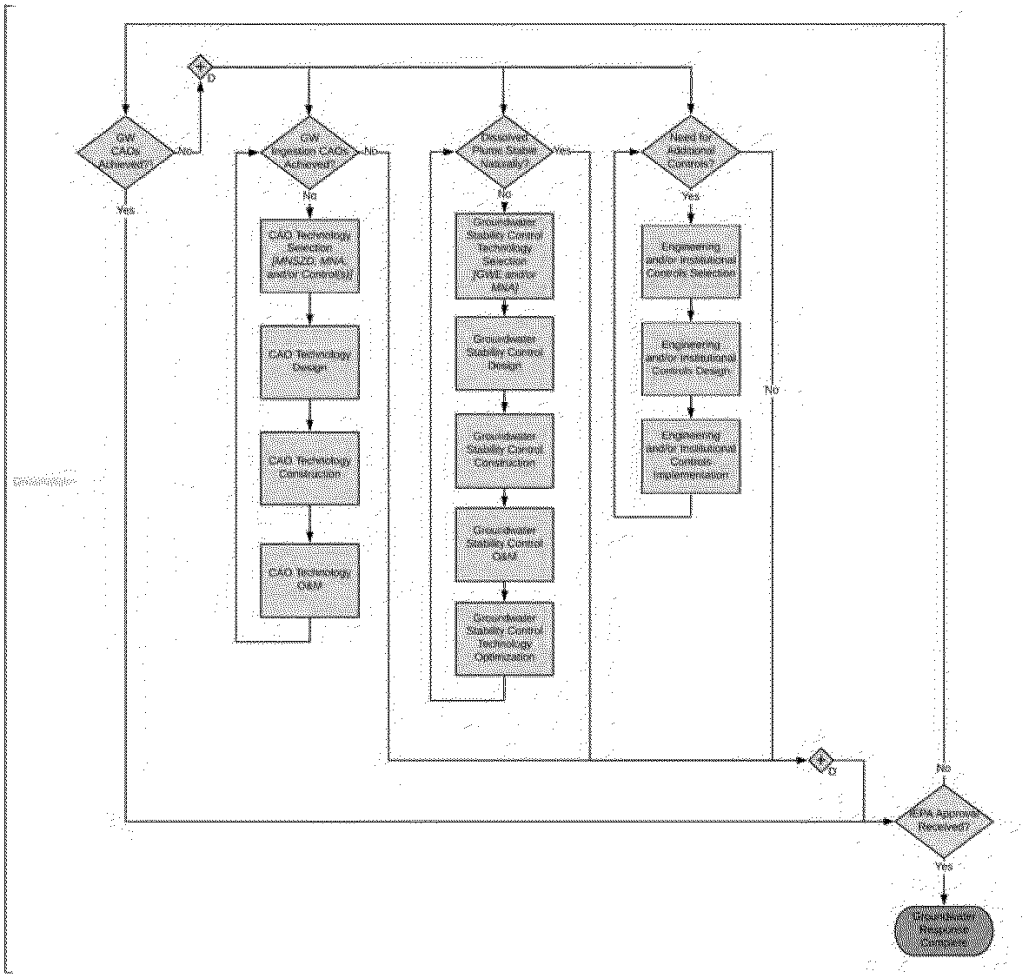
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Assumption: Only chronic (no acute) concerns exist

Figure 22 Soil Tactical Plan (see full size figure following the text).

SR000688

The tactical plan detailing the process to be followed to implement the groundwater portion of the Strategic Plan (Figure 17) is presented in Figure 23.



Notes:
Additional presumptive remedies added in the future could also be considered to achieve the groundwater CAOs. The applicability of the additional remedies would be outline in the modification report.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Assumes exposure route will not be excluded and CAOs are established and approved by IEPA per the Strategic Plan (Figure 15).

Definitions:
CAO - Corrective Action Objective
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
GWE - Groundwater Extraction
MNA - Monitored Natural Attenuation
MNSZD - Monitored Natural Source Zone Depletion
O&M - Operations and Maintenance

DT01: Premcor Hartford Tactical Plan - Dissolved Phase

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Assumption: Only chronic (no acute) concerns exist

Figure 23 Groundwater Tactical Plan (see full size figure following the text).

The tactical plan detailing the process to be followed to implement the soil gas portion of the Strategic Plan (Figure 18) is presented in Figure 24.

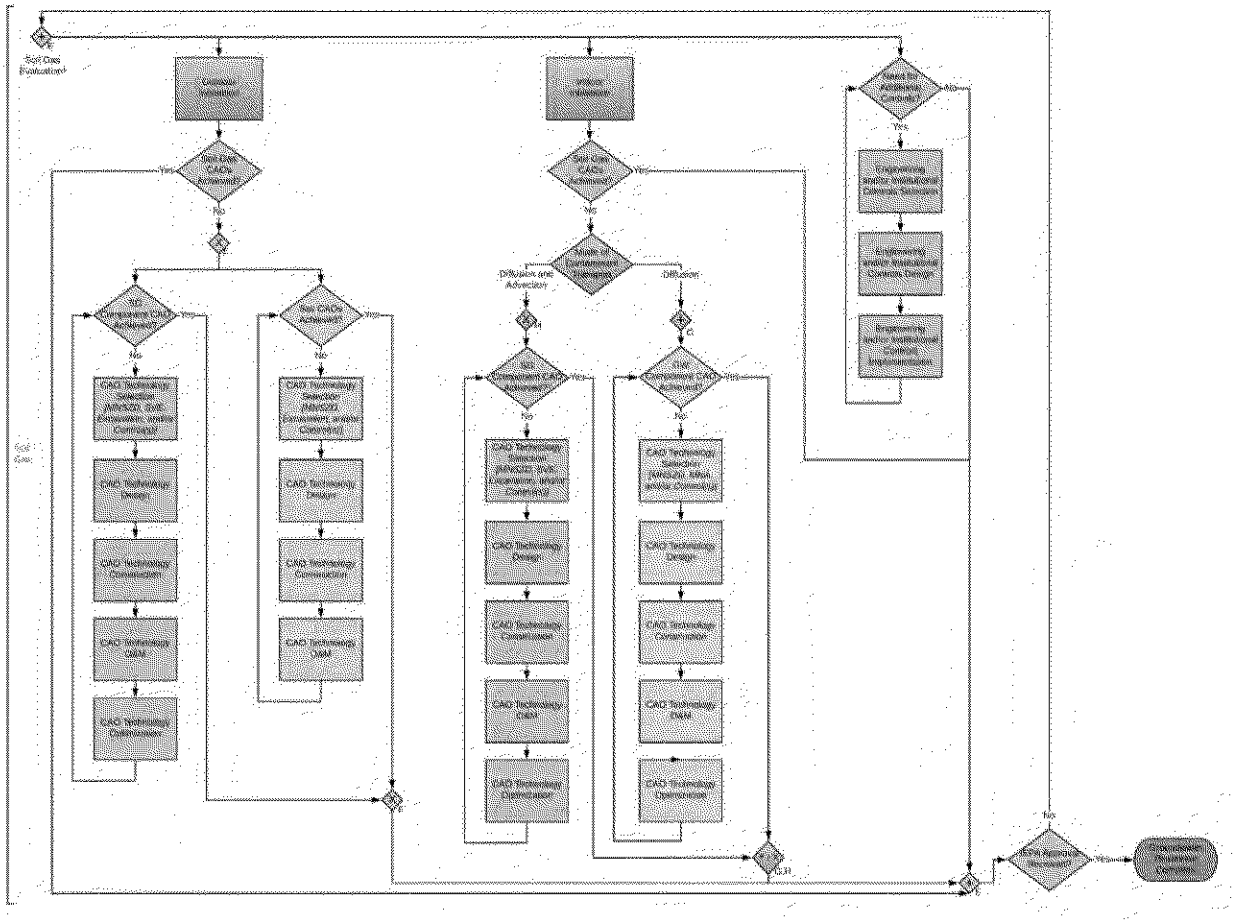
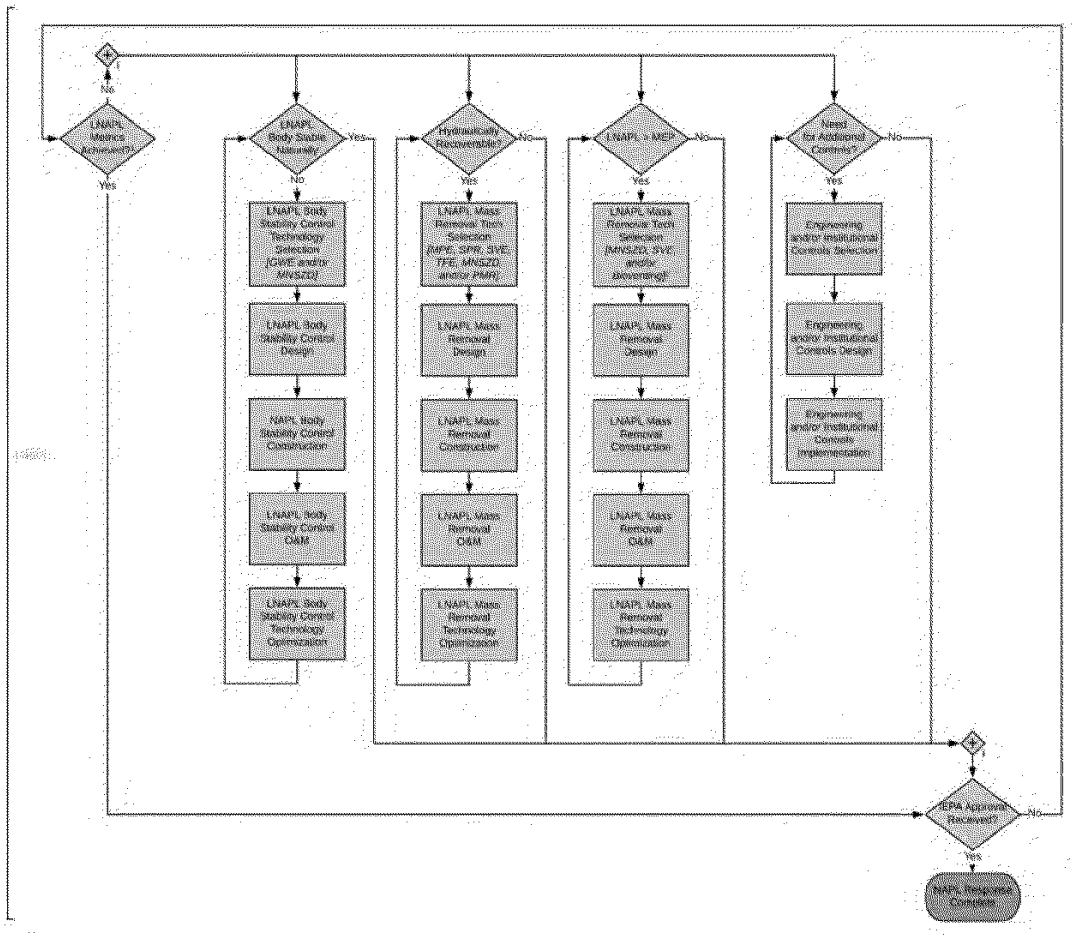


Figure 24 Soil Gas Tactical Plan (see full size figure following the text).

The tactical plan detailing the process to be followed to implement the LNAPL portion of the Strategic Plan (Figure 19) is presented in Figure 25.



Additional presumptive remedies added in the future could also be considered to achieve the LNAPL metrics. The applicability of the additional remedies would be outline in the modification report.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Assumes NAPL is present and site-specific metrics are established and approved by IEPA per the Strategic Plan (Figure 15).

2 - Soil Vapor Extraction and Bioventing would be implemented on the Western Property Boundary Line only as described in Section 4.2.

CAO - Corrective Action Objective
IEPA - Illinois Environmental Protection Agency
GWE - Groundwater Extraction
LNAPL - Light Non-Aqueous Phase Liquid
MEP - Maximum Extent Practicable
MNSZD - Monitored Natural Source Zone Depletion
MPE - Multiphase Extraction
O&M - Operations and Maintenance
PMR - Periodic Manual Recovery
SPR - Skimmer Pump Recovery
SVE - Soil Vapor Extraction
TFE - Total Fluids Extraction

NT01 Premcor Hartford Tactical Plan - NAPL

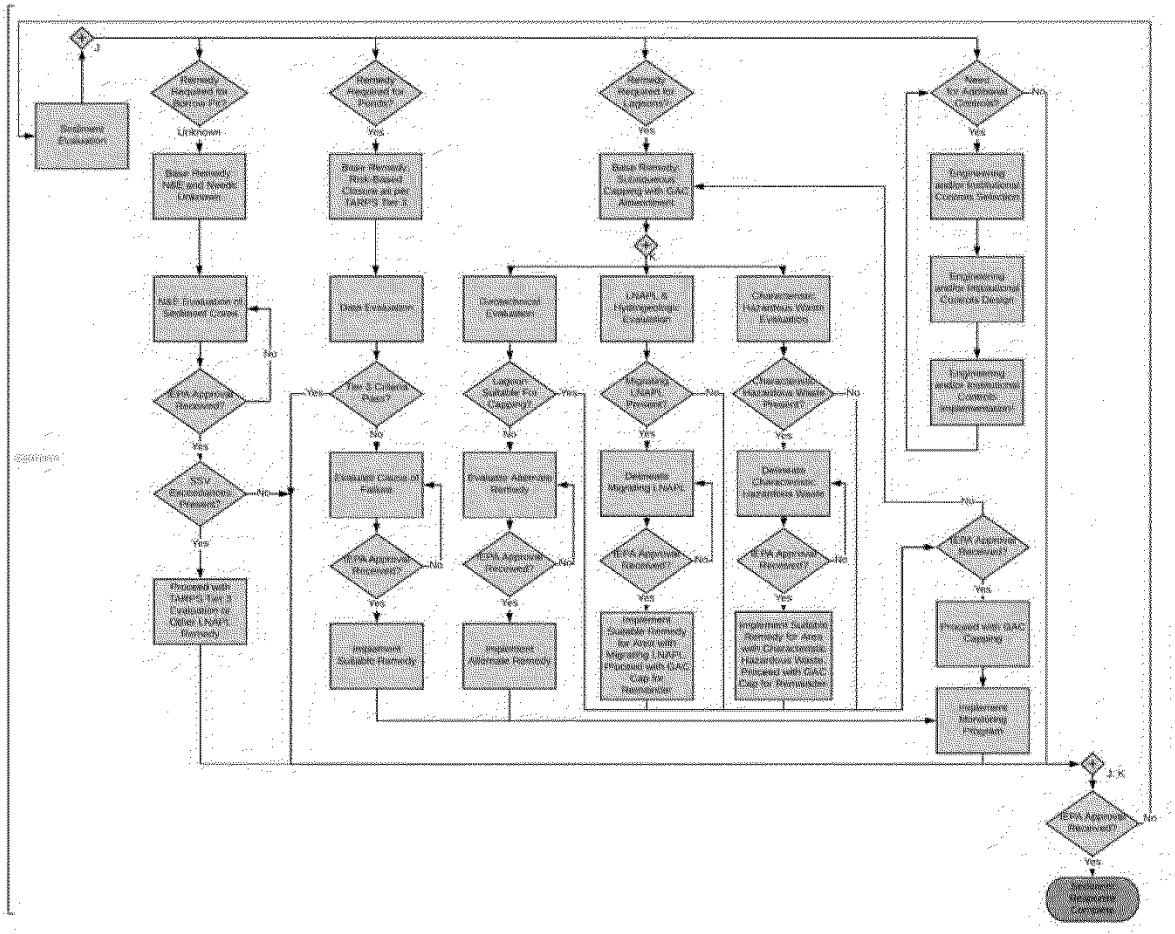
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Attorney-Client Privileged Attorney Work Product

Assumption: Only chronic (no acute) concerns exist

Figure 25 LNAPL Tactical Plan (see full size figure following the text).

The tactical plan detailing the process to be followed to implement the sediment portion of the Strategic Plan (Figure 20) is presented in Figure 26. Additional detail is provided separately in the *Path Forward Approach for the River Dock Area Sediments, Premcor Facility* (GEI 2018a; Appendix A3).



Notes:
Additional presumptive remedies added in the future could also be considered to achieve the sediment metrics. The applicability of the additional remedies would be outlined in a modification report.

This plan assumes that all third party property owners or controlling permit entities will approve the plan and allow access to the entirety of the area to perform the work.

- Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Institutional controls that specify that no disturbance can occur without precautions to prevent exposure, and minimize unauthorized access, include deed records, access control, access permitting, work permits, and other controls for each affected property. Planned disturbance, such as maintenance or construction activities, will require a Soil Management Plan to specify worker protection measures for each affected property.

Definitions:
IEPA - Illinois Environmental Protection Agency
GAC - granual activated carbon
LNAPL - Light Non-Aqueous Phase Liquid
N&E - Nature and extent
SSV - Sediment Screening Value
TARPS - Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments

SD01: Premcor Hartford Tactical Plan - Sediment

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Attorney-Client Privileged Attorney Work Product

Assumption: Only chronic (no acute) concerns exist

Figure 26 Sediment tactical plan (see full size figure following the text).

4.2.2 Process Oversight

Premcor will document progress for each tactical plan in routine reports and provide notifications as described in the Reporting Process and Structure section (Section 4.4.2).

As noted in each of the media/route tactical plan processes, Illinois EPA must review and approve that all relevant science- and risk-based CAOs and site-specific metrics, as defined in Section 4.3, are developed in accordance with TACO where appropriate, and have been met before a media/route corrective action is complete.

4.3 QUANTIFYING DECISION POINTS AND METRICS

One critical task towards attainment of certainty relative to the project path forward is quantifying decision point metrics and objectives so that any activity has clear and measurable design objectives. Where appropriate, these decision points metrics, endpoints, and objectives are defined through the TACO process. The CAOs described in this Strategic Plan include either Tier 1, Tier 2, or Tier 3 ROs as defined in TACO or CAOs documented and approved in a CAOR as described in Section 4.4.2.

Where flexibility is present in TACO, quantified decision point metrics and objectives have been jointly established with Illinois EPA for greater certainty in this Strategic Plan. These metrics and objectives define the decision point (point of diminishing returns) for remedy systems as well as metrics to evaluate stability and to control any potential for off-site migration of COCs. All of the decision point metrics and TACO requirements need to be met to obtain permanent remedy objectives and closure of the Facility. In the case that the decision point metrics are met, but TACO requirements are not, corrective action will continue until such time that TACO requirements are met.

Other metrics and objectives may be jointly established in the future, where necessary, in a CAOR as specified in Section 4.4.2.

Table 2 presents the decision point metrics for dissolved-phase plume stability. Stability will be evaluated via plume scale analysis or individual well scale analysis, using trends in overall mass/center of mass or groundwater analytical concentrations in wells, respectively as shown in the table. The guidance followed includes but may not be limited to: *Geospatial Analysis for Optimization at Environmental Sites* (ITRC 2016), *Statistical Estimation and Visualization of Ground-Water Contamination Data* (U.S. EPA 2000), *Groundwater Statistics for Monitoring and Compliance* (ITRC 2013), and *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* (U.S. EPA 2009). Results will be included in five-year evaluation reports and CMCRs, as detailed in Section 4.4.2.

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
Plume Scale Analysis (Mass Moment Analysis)	Zeroeth Moment (mass) Stable/Decreasing OR 1st Moment (center of mass) Stable/Receding	Geospatial Analysis Consistent with *Geospatial Analysis for Optimization at Environmental Sites* (ITRC 2016) and/or *Statistical Estimation and Visualization of Ground-Water Contamination Data* (U.S. EPA 2000)	• Center of mass analysis performed both laterally and vertically. Analysis performed every 5 years while IGC continues (Section 4.4.1). • With Active LNAPL Recovery – Use up to 10 years of data • Gradient Control Only – Use at least 3 years of data after shutdown of active LNAPL recovery
Individual Well Scale Analysis	Stable/Decreasing trends at individual wells	Statistical Trend Analysis Consistent with *Groundwater Statistics for Monitoring and Compliance* (ITRC 2013), and/or *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance* (U.S. EPA 2009)	

Table 2 Dissolved-phase plume stability metrics. Any one of these metrics must be met to demonstrate dissolved-phase plume stability.

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Table 3 presents the decision point metrics for dissolved-phase COC migration across the WPBL. Migration will be evaluated during gradient control by analyzing the inward gradient using gauging and sampling according to Section 4.4.1. Migration will be evaluated after shutdown of gradient control by analyzing migration of dissolved-phase COCs exceeding CAOs across the WPBL. Exposure route exclusion will be evaluated at any time during the process. The guidance followed includes, but may not be limited to: *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (U.S. EPA 1999), *Geospatial Analysis for Optimization at Environmental Sites* (ITRC 2016), *Use and Measurement of Mass Flux and Mass Discharge* (ITRC 2010), Groundwater Monitoring Plan in Section 4.4.1, and TACO. Results will be included in quarterly reports, annual reports, five-year evaluation reports, and CMCRs, as detailed in Section 4.4.2.

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
With Gradient Control			
Off-site Migration Analysis	Inward gradient in the uppermost aquifer (Main Silt, EPA Stratum, or Main Sand) along the WPBL	Gauging per Groundwater Monitoring Plan	• Table 10
After Shutdown of Gradient Control			
Off-site Migration Analysis	No migration of dissolved-phase COCs exceeding the CAOs off-site across the WPBL	COC concentrations within the 50-foot bioventing and/or SVE strip along the WPBL in conjunction with site-specific distance/concentration MNA plots or biodegradation models with *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (U.S. EPA 1999) and/or	• Natural Conditions - Use at least 3 years of data for select wells along the WPBL after shutdown of gradient control system

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
		Geospatial Analysis Consistent with *Geospatial Analysis for Optimization at Environmental Site* (ITRC 2016) and/or *Use and Measurement of Mass Flux and Mass Discharge* (ITRC 2010)	
Either With or After Shutdown of Gradient Control			
Off-site Migration Analysis	Exposure route exclusion	TACO	• All criteria to exclude the route are met or a documented plan is in place to achieve them

Table 3 Dissolved-phase plume migration metrics for the WPBL. The measurement standard for the applicable status of gradient control must be met to demonstrate satisfaction of the dissolved-phase plume migration objective.

Table 4 presents the decision point metrics for dissolved-phase plume stability along the Industrial Property Boundary Line - South (IPBL-S) and Industrial Property Boundary Line - North (IPBL-N). Stability will be evaluated by analyzing stability and degradation of dissolved-phase COCs exceeding CAOs adjacent to IPBL-N and IPBL-S (modeling approach and monitoring approach). The guidance followed includes: Groundwater Monitoring Plan (Section 4.4.1), *Geospatial Analysis for Optimization at Environmental Sites* (ITRC 2016), *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (U.S. EPA 1999), *Use and Measurement of Mass Flux and Mass Discharge* (ITRC 2010), and TACO. Results will be included in annual reports, five-year evaluation reports, and CMCRs, as detailed in Section 4.4.2.

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
COC Stability Analysis	Stability and/or degradation of dissolved-phase COCs exceeding the CAOs adjacent to the property boundary line	Groundwater elevation and dissolved-phase concentration measured per the Groundwater Monitoring Plan	• Use at least 3 years of data for select wells along the property boundary line

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
		Analysis methodologies to demonstrate stability or degradation per: Geospatial Analysis Consistent with *Geospatial Analysis for Optimization at Environmental Site* (ITRC 2016) and/or Site-specific distance/concentration and/or biodegradation modeling with *Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites* (U.S. EPA 1999) and/or *Use and Measurement of Mass Flux and Mass Discharge* (ITRC 2010)	
Route exclusion	N/A	TACO	• All criteria to exclude the route are met or a documented plan is in place to achieve them

Table 4 Dissolved-phase plume migration metrics for the IPBL-S and IPBL-N. Any one of these measurement standards may be used to demonstrate satisfaction of the dissolved-phase plume migration objective.

Table 5 presents the decision point metrics for LNAPL body stability. Stability will be evaluated using both lateral and vertical stability analysis. Lines of evidence and preponderance of evidence will guide the analysis. Results will be included in annual reports, five-year evaluation reports, and CMCRs, as detailed in Section 4.4.2.

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
Lateral Stability Analysis	No lateral expansion of the LNAPL body outside of periodic fluctuations due to groundwater elevation fluctuations	Lines of Evidence Approach, Preponderance of Evidence	• LNAPL is from historic releases and there is no evidence of ongoing releases that could theoretically feed an expanding plume. Qualitative metric based on historic forensic analysis and current operational context. • Remediation systems have effectively reduced the source mass. Qualitative metric based on reduced potential for migration by reducing LNAPL saturation. The reduction in saturation threshold will be the same as the metrics described in the hydraulic LNAPL recovery metrics table. • Extent of LNAPL is stable within a range of fluctuating water table driven variation based on statistical trend analyses. • LNAPL footprint evaluation – up to 10 years of data with stable footprint based on LNAPL occurrence in wells. Use at least 3 years of data after suspension of LNAPL
Vertical Stability Analysis	No vertical expansion of the LNAPL body outside of the residual LNAPL footprint due to groundwater fluctuations	Lines of Evidence Approach, Preponderance of Evidence	

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
			recovery and/or gradient control. • Apparent LNAPL thickness in monitoring wells varies with water table elevation consistently with LNAPL in vertical equilibrium (i.e., consistent with perched, confined, or unconfined trends on a diagnostic gauge plot), or mobile NAPL interval thickness at well locations is stable according to well LNAPL conceptual models. • Dissolved-phase plume stability as an analog for LNAPL plume stability – use same metrics as Table 2.
Local Redistribution Across Property Boundaries Analysis	No local redistribution across property boundaries away from the Facility	Lines of Evidence Approach, Preponderance of Evidence	• Unconfined conditions – maintain inward gradient; or • Confined conditions – structure contour (confining surface) gradient is towards the refinery; or • Hydraulic recovery decision point achieved.

Table 5 LNAPL body stability metrics. All of the decision point metrics must be met to demonstrate LNAPL body stability, but only one or more of the measurement standards must be used to demonstrate achievement of the decision point metrics.

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Table 6 presents the decision point metrics for hydraulic LNAPL recovery. Hydraulic LNAPL recovery will be evaluated using LNAPL transmissivity, cumulative recovered volume, and remaining recoverable volume. The guidance followed include: ASTM E2856 or most current method approved by the Illinois EPA, decline curve methodologies from Poston and Poe (2008) and API (2001), and LNAPL Distribution and Recovery Model from Charbeneau (2007). Results will be included in annual reports, five-year evaluation reports, and CMCRs, as detailed in Section 4.4.2.

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
LNAPL Transmissivity (T_n) Analysis	≤ 0.8 ft^2/day	ASTM E2856 or most current method approved by the Illinois EPA	• Monitor based on LNAPL recovery data until recovery based calculation indicates Tn $\leq$ 0.8 ft^2/ day calculated via methods in ASTM E2856. • Shutdown recovery operations and allow wells to return to equilibrium. • Verify T_n using an individual well test (baildown test, manual skimming test, or LNAPL/water ratio test) via methods in ASTM E2856. Test at least one well within radius of influence of the recovery system. Geostatistics may or may not be utilized to more accurately represent the distribution of LNAPL transmissivity within the radius of influence of the recovery system. • LNAPL under perched or confined conditions may be tested under any groundwater conditions. LNAPL under unconfined conditions shall be tested under the most conservative conditions, which is under seasonally low groundwater conditions (defined

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
			as the quarter with the lowest average groundwater elevation for the preceding 10 years) within 1 year of suspension of recovery operations.
Cumulative Recovered Volume Analysis	≥ 90% of Expected Ultimate Recovery Volume	Decline Curve Analysis Poston and Poe 2008 API 2001	• Monitor based on LNAPL recovery data on a rate-cumulative decline curve via methods in Poston & Poe 2008 and API 2001. • Estimate expected ultimate recovery volume via first-order decay model.
Remaining Recoverable Volume Analysis	≤ 10% of Total Remaining LNAPL Volume (mobile and residual)	LNAPL Distribution and Recovery Model and/or Decline Curve Analysis Charbeneau 2007	• Estimate the expected ultimate recovery volume via rate-cumulative decline curve analysis with a first-order decay model or a calibrated LNAPL Distribution and Recovery Model. Remaining recoverable volume is the difference between the cumulative recovered volume and the expected ultimate recovery volume. • Estimate total volume using an LNAPL f-factor as described in Charbeneau 2007.

Table 6 Hydraulic LNAPL recovery decision point metrics. Any one of these metrics must be met to demonstrate LNAPL has been recovered to the hydraulic recovery decision point.

Table 7 presents the decision point metrics for the LNAPL MEP endpoint. LNAPL MEP will be evaluated using measured or observed free product in wells, according to the Illinois EPA. Results will be included in annual reports, five-year evaluation reports, and CMCRs, as detailed in Section 4.4.2.

Endpoint	Threshold	Measurement Standard	Measurement Process
Individual Wells Analysis	No measurable or visually observed product, including a sheen, detected in a well for four consecutive quarterly or semiannual monitoring events, unless otherwise approved by the Illinois EPA	Illinois EPA	Groundwater monitoring events

Table 7 MEP LNAPL endpoint metrics. This metric must be met to demonstrate LNAPL has been recovered to the MEP.

Table 8 presents the decision point metric for soil gas migration to off-site from contaminated groundwater for the WPBL. Soil gas migration will be evaluated by analyzing the migration of vapor-phase COCs exceeding the soil gas CAOs along the WPBL when dissolved-phase plume stability metrics are met under natural conditions, maintaining a vacuum along the WPBL in the uppermost permeable stratum, maintaining a vacuum at the SVE manifold, maintaining oxygen concentration, and evaluating exposure route exclusion. TACO guidance will be followed. Results will be included in annual reports, five-year evaluation reports, and CMCRs, as detailed in Section 4.4.2.

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
After Shutdown of SVE and/or Bioventing			
Off-site Migration Analysis	No migration of vapor-phase COCs exceeding the soil gas CAOs along the WPBL when dissolved-phase plume stability metrics are	CAO values	• Annual measurement of soil gas values in uppermost permeable stratum wells under non-operating SVE system conditions to demonstrate absence of values exceeding soil gas CAOs

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
	met under natural conditions		
During SVE and/or Bioventing			
Off-site Migration Analysis	No migration of vapor-phase COCs exceeding the soil gas CAOs along the WPBL when dissolved-phase plume stability metrics are met under natural conditions	Maintain vacuum along the WPBL in the uppermost permeable stratum	• Gauge vacuum in sealed wells: Measured vacuum or an occluded screen in select vapor monitoring wells along the WPBL while SVE along WPBL is operational
		Maintain vacuum at SVE Manifold	• Maintain manifold vacuum of at least 5 inches of Hg at least 75% per annum and-monitor SVE system manifold vacuum at least once weekly
		Maintain oxygen concentration during bioventing	• Maintain oxygen concentration sufficient to support aerobic biologic activity. Measurement locations and frequency along with a quantitative threshold would be proposed in conjunction with construction and operation of a bioventing system
Either During or After Shutdown of SVE and/or Bioventing			
Off-site Migration Analysis	No migration of contaminated groundwater above CAOs for indoor inhalation exposure route	CAO values	• Groundwater Monitoring Results compared to CAOs
	Exposure route exclusion	TACO	• All criteria to exclude the route are met or a documented plan is

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
			in place to achieve them

Table 8 Soil gas migration metrics for the WPBL. One measurement standard for the applicable status of soil gas control must be met to demonstrate there is no potentially complete exposure route from the Facility to the Village of Hartford while meeting the metrics specified in Table 3.

Table 9 presents the decision point metrics for soil gas recovery. Soil gas recovery will be evaluated using the cumulative recovered volume, the respiration rate, and route exclusion. Any one of these metrics must be met to demonstrate soil gas has been recovered to the decision point. The guidance followed include: *Soil Vapor Extraction and Bioventing* (USACE 2001), decline curve methodologies from Poston and Poe (2008) and API (2001), and TACO. Results will be included in annual reports, five-year evaluation reports, and CMCRs, as detailed in Section 4.4.2.

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
Cumulative Recovered Volume	≥ 90% of Expected Ultimate Recovery Volume	Decline Curve Analysis Poston and Poe 2008 API 2001	• Monitor based on LNAPL recovery data on a rate-cumulative decline curve via methods in Poston & Poe 2008 and API 2001 • Estimate expected ultimate recovery volume via first-order decay model
Respiration Rate	Respiration rate (% oxygen/day) drops below quantitative threshold	Evaluation consistent with: *Soil Vapor Extraction and Bioventing* (USACE 2002)	• Measurement locations and frequency along with a quantitative threshold would be proposed in conjunction with construction and operation of a bioventing system.
Route exclusion	N/A	TACO	• All criteria to exclude the route are met or a documented plan is in place to achieve them

Table 9 Soil gas recovery metrics. Any one of these metrics must be met to demonstrate soil gas has been recovered to the decision point.

4.4 OPERATIONAL PROCESSES AND PROCEDURES

A set of operational processes and procedures for groundwater quality monitoring have been previously developed and approved by Illinois EPA. These documents, included in Appendix A6, form the basis for site work moving forward.

Operational processes and procedures introduced in or modified by this Strategic Plan are discussed further in this section.

4.4.1 Groundwater Sampling and Measurement Protocols

Groundwater Analytical Monitoring

Screening Evaluation to Optimize COCs, Well Locations, and Monitoring Frequency

Overall, the process described below and in Appendix A7 was used to evaluate groundwater sampling and measurement protocols, while changes to the program will continue to meet applicable regulations. The *Groundwater Monitoring Plan (Rev 3)* (SMA 2013a) includes sampling for 62 analytes at 191 total well locations on the Main Facility (excluding the RDA). The historical COCs are defined in Appendix 3 of the Consent Order. This sampling schema was designed to characterize conditions and develop the CSM. However, that characterization is largely complete for the Main Facility, as described in Section 2. It is now appropriate to craft a routine monitoring plan going forward for the Facility that can be more efficient and streamlined. Modifications subsequent to this analysis will be addressed in CAORs, and the analysis rerun if jointly agreed to by Illinois EPA and Premcor.

In accordance with Illinois EPA regulations, the full COC list must be analyzed annually for the Facility. However, Illinois EPA regulations allow for optimization of the COC list based on site data (35 Ill. Adm. Code 724.196(c)). A step-wise process was implemented to develop a targeted, refined list of COCs for future sampling. As an initial step, any COC that has not been detected in any well, over all the years of available data, was excluded from analysis for future monitoring events. This list was then further refined by excluding COCs that do not exceed the GRO in any samples or have not exceeded the GRO for 3 consecutive years (per 35 Ill. Adm. Code 724.196(c)). The resulting list of 26 COCs for the Spring Monitoring Event groundwater sampling is provided in Table 10.

1,2-Dichloroethane	Bis(2-ethylhexyl) phthalate	Methyl Tert-Butyl Ether (MTBE)
2,4-Dimethylphenol	Cadmium (total)	Naphthalene
Arsenic (total)	Chloroform	Nickel (total)
Barium (total)	Chromium (total)	Phenol
Benzene	Chrysene	Tetrachloroethene
Benzo(a)anthracene	Dibenzo(a,h)anthracene	Toluene
Benzo(a)pyrene	Ethylbenzene	Trichloroethene
Benzo(b)fluoranthene	Indeno(1,2,3-Cd)Pyrene	Vanadium (total)
Benzo(k)fluoranthene	Lead (total)	

Table 10 Refined COC list from Appendix A7 based on removal of compounds with no concentrations above detection limits from 2004 to 2017 and removal of compounds that did not exceed their respective Class I GRO within the most recent 3 years of data representative of current site conditions. This forms the COC list for the Spring Monitoring Event.

The COC optimization analysis utilized to determine the appropriate COCs for the Fall Monitoring Event sampling included evaluation of whether a smaller data set of COCs can be identified to represent the underlying trends in the data (surrogate COCs) (Appendix A7). Concentrations of different COCs over time may be correlated. If these correlations are significant, one of these COCs can be used to represent one or more other analytes it is strongly correlated with, as described in Appendix A7. Analyte correlation in conjunction with *de minimis* frequency analysis (Appendix A7) was used to identify four surrogate COCs to be evaluated during the Fall Monitoring Event – benzene, methyl tert-butyl ether (MTBE), arsenic, and lead (Table 11).

Benzene	Methyl Tert-Butyl Ether (MTBE)	Arsenic (total)
Lead (total)		

Table 11 Surrogate COC list from Appendix A7 to be sampled for during the Fall Monitoring Event.

The network of wells to be sampled was refined to exclude low priority wells. These wells include those screened at depth in the Main Deep and Main Basal hydrostratigraphic zones, which typically have not had detectable measurements of any COCs across all years sampled, or have not had any exceedances of the GROs over a threshold number of years.

The wells to be sampled each year in the Spring and Fall Monitoring Events are identified in Figure 27 and detailed in Appendix A4. In addition, a subset of the wells screened in the Main Deep zone will be sampled at each 5-year review to demonstrate continuity of vertical delineation of COCs. The Main Deep zone wells to be sampled will be selected dynamically at each 5-year review based on data from the preceding 3 years of monitoring events (i.e., only for those intermediate zone wells that have exhibited COC concentrations greater than the Class I GROs during the preceding 3 years per 35 Ill. Adm. Code 724.196(c), and which have corresponding Main Deep wells).

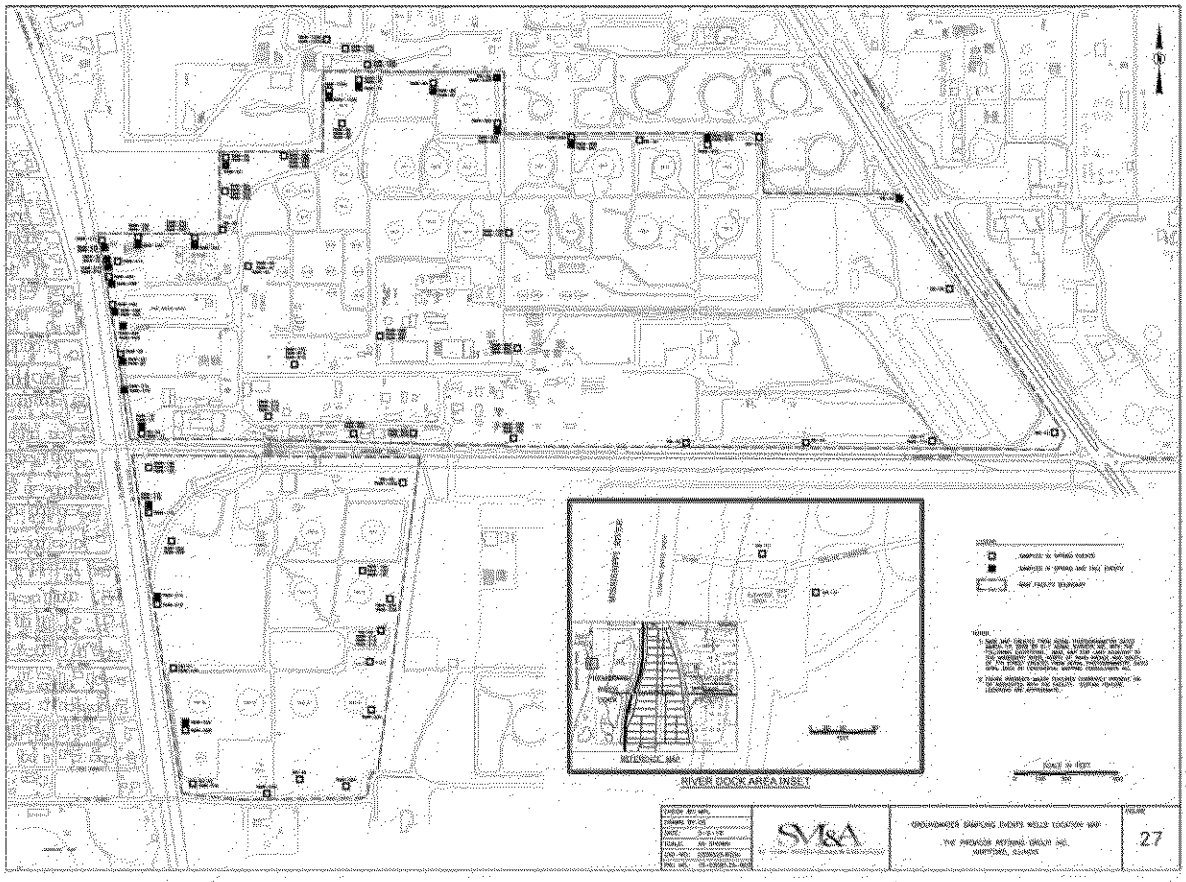


Figure 27 Spring and Fall Groundwater Sampling Events Well Location Map (see full size figure following the text).

All wells in the monitoring network will be maintained as a contingency for future use, as needed (e.g., future plume delineation, monitoring in the event of a new or existing release), unless their removal is approved by Illinois EPA. For PCAs now and in the future, the disposition and monitoring, if any, for wells associated with each PCA will be specified in the PCA report for each area, which must be approved by Illinois EPA.

Groundwater monitoring data from the Spring and Fall Monitoring Events will be provided in an appropriate electronic data deliverable (EDD) format to the Illinois EPA.

Fluid Elevation Monitoring

The groundwater monitoring program will include semiannual gauging, once during the Spring Monitoring Event and once during the Fall Monitoring Event. Wells to be gauged during the Spring and Fall Events are shown in Figure 28 and detailed in Appendix A4.

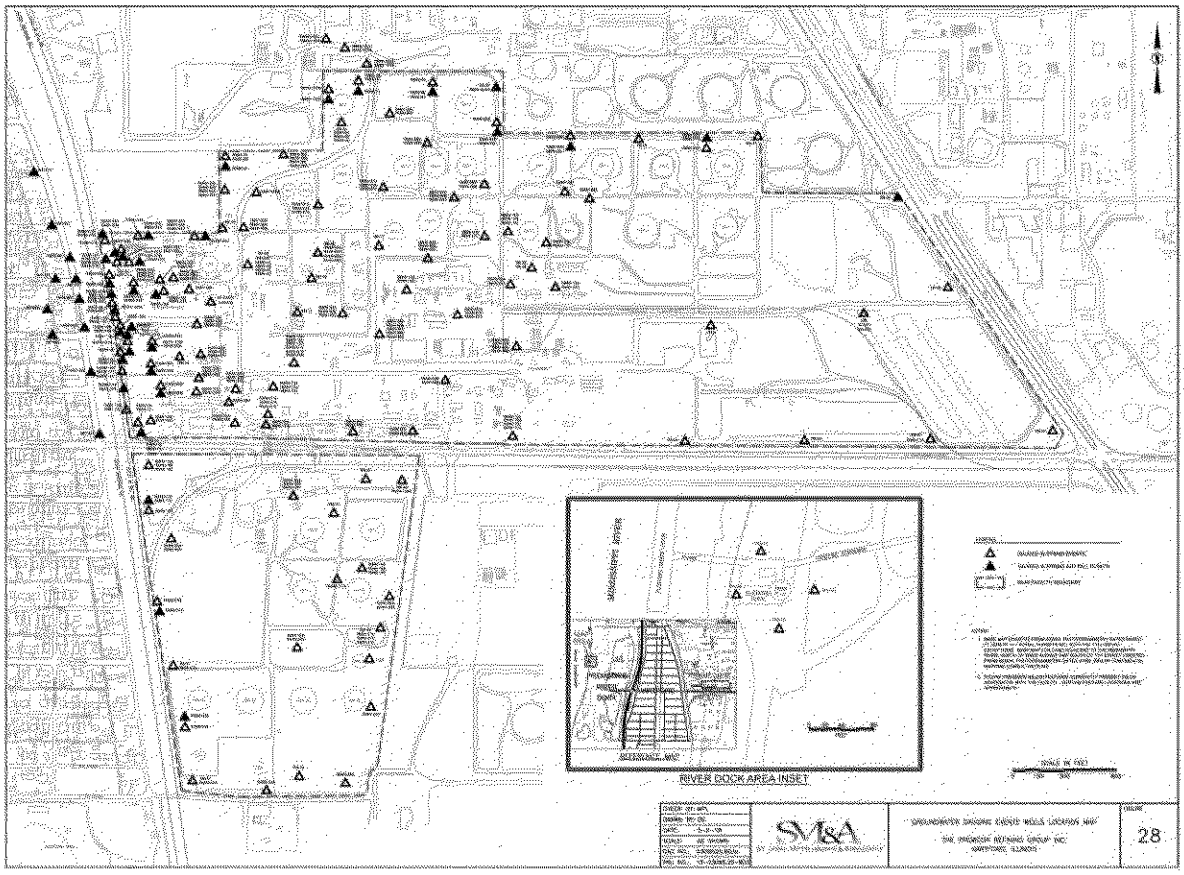


Figure 28 Spring and Fall Groundwater Gauging Events Well Location Ma p (see full size figure following the text).

Groundwater monitoring data from the Spring and Fall Monitoring Events will be provided in an appropriate EDD format to the Illinois EPA.

Groundwater Monitoring Implementation

Well gauging and groundwater sampling will proceed in accordance with the identified well network and following the appropriate Standard Operating Procedures:

- 110 Records, Reports, Field Reporting, Documentation, and Record Retention
- 213 Well Maintenance & Rehabilitation
- 220 Groundwater and NAPL Level Measurements
- 320 Field Measurements
- 410 Groundwater Sampling
- 415 Low Flow Groundwater Sampling
- 500 Equipment Decontamination
- 910 Sample Containers, Preservation, and Holding Times
- 911 Sample Classification, Storage, Packaging, and Shipment
- 912 Sample Control and Custody Procedures

- 920 Field Quality Assurance Samples
- 930 Control, Calibration and Maintenance of Measurement and Test Equipment
- 940 Waste Management Procedures

The refined list of analyte groups and methods, as a result of the evaluation detailed in Appendix A7, are presented in Table 12.

Analyte Group	COCs
Metals, total	Barium, cadmium, nickel, vanadium, chromium, arsenic, lead
VOCs	1,2-Dichloroethane, benzene, chloroform, ethylbenzene, MTBE, tetrachloroethene, toluene, trichloroethene
SVOCs	2,4-Dimethylphenol, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, bis(2-ethylhexyl) phthalate, chrysene, dibenzo(a,h)anthracene, indeno(1,2,3-Cd)pyrene, naphthalene, phenol

Table 12 Groundwater sampling analyte groups and methods.

MNSZD

Industry standard guidance documents (ITRC 2009, API 2017) for MNSZD methodologies are designed to measure the NSZD rate in the vadose, smear, and saturated zones for LNAPL under unconfined conditions in a single aquifer. LNAPL at the Facility is found under more complex conditions including both unconfined and confined conditions in multiple strata. Therefore, a technology demonstration period is required to identify the most effective methodology for long-term MNSZD. An initial approach is presented in the *Technical Memo for MNSZD Initial Assessment Scope and Approach* (GEI 2018b), included as Appendix A5.

The initial approach will incorporate potentially applicable industry standard methods as well as developing methodologies for measuring NSZD rates for confined LNAPL that have been published in peer reviewed literature.

Three sets of data will be collected in these two areas at the Facility as follows:

1. Temperature profile within existing monitoring wells from the bottom of the screened intervals through the saturated zone (Main Sand or EPA Stratum) and into the Main Silt or B/C Clay (Figure 8) depending on the location of the well and length of the screen. A maximum length of 30 feet of temperature profile will be collected.

2. Dissolved gases in both LNAPL in select wells, where present, and groundwater for methane (CH_4), carbon dioxide (CO_2), nitrogen (N_2), argon (Ar), and oxygen (O_2) collected from within the same wells selected for temperature profiling. The selected wells include upgradient (background), plume, and downgradient wells. Changes in the N_2 concentration over time can be used to estimate the rate of methanogenesis that has occurred during that time interval (Amos *et al.* 2005). Therefore, several measurements spanned over a period of time would be needed to determine changes in N_2 concentrations over time.

3. CO_2 emission rate through the vadose zone into the atmosphere using CO_2 traps.

In addition to these three major activities, the groundwater samples will be analyzed for electron acceptors and anaerobic reduction parameters including nitrate (NO_3^-), sulfate (SO_4^{-2}), manganese II (Mn^{+2}), Manganese VI (Mn^{+4}), ferrous iron (Fe^{2+}), Ferric Iron (Fe^{+3}), and sulfide (S^{-2}).

The results of the technology demonstration analysis will be utilized to identify the most effective methodology for long term MNSZD at the Facility. A plan will be developed for this methodology to collect sufficient information to characterize the NSZD rates over time. The results of these studies will be documented in a workplan to quantify plume scale NSZD and NA rates that will be submitted as a preapproval report (Section 4.4.2).

Remedy System O&M

O&M plans will be optimized for each remedy system on the Facility. The plans will contain, at a minimum, the list of system O&M activities, a general schedule for performance of the activities, and planned waste management practices. A copy of the plan will be readily available to all staff that work with the system and will be made available to the Illinois EPA upon request.

4.4.2 Reporting Process and Structure

Communication with the Illinois EPA will take place through routine annual reports, quarterly reports, and five-year evaluation reports, as well as in metrics / CAORs, preapproval reports, and corrective measures completion reports, and modification reports.

Annual Reports

One annual report will be provided by March 1st of each year for the preceding year. The intent of this report is to provide a concisely focused forward-looking status report of progress towards attainment of closure for the Facility. It summarizes the activities taken within the flexibility allowed by ASM and their effectiveness, including new investigation data from the previous year. The report will also address any Illinois EPA notification requests for additional data.

The structure of the report will be based on the objectives laid out in the Strategic Plan, shown in Figure 15. The report will include:

- The activities that have been performed, relevant to each remediation objective, as appropriate during the reporting period;
- Tabular, graphical, and/or map-based summaries of the corrective action activities performed and associated monitoring data;
- Trend analysis demonstrations towards attainment of closure and/or remedy decision points;
- Estimates of progress towards attainment of closure and/or remedy decision points;
- Summary of site status;
- Projected work for the next reporting period; and
- Material to address any Illinois EPA notifications received.

The report will also provide supporting details for the implementation of each tactical plan, shown in Figure 22 through Figure 25, as necessary. The specific appendices will vary from year to year, depending on the specific site activities completed. Examples of materials that could be included in the tactical appendices include:

- Documentation of any technology selection
    - Identification of the presumptive technology selected
    - Metrics to govern the decision points and endpoints of the technology
- Documentation of any technology design
    - Map or description of the general location of the system
    - A general process flow diagram sufficient to communicate the conceptual design and function of the system
- Documentation of any technology construction
    - System photograph, as-built process flow diagram, or map with general system components as-built
    - Copies of required permits
- Documentation of any O&M
    - List of O&M procedures
    - Monitoring schedule

  - Waste management practices
- Documentation of optimization
  - Start or stop a presumptive remedy (remedy location and date)
  - Changes in mode of operation of presumptive remedies

Activities summarized in the annual report are those taken within the flexibility offered by ASM. A completed Quarterly, Annual, and Five-Year Reporting Form (Appendix A8) must accompany the report. No response from Illinois EPA for each annual report is required or anticipated.

Quarterly Reports

Four quarterly reports will be provided by March 1st, May 1st, August 1st, and November 1st for each preceding quarter. The intent of these reports is to provide a summary of site activities conducted, site conditions, and progress towards attainment of closure and/or remedy decision points along the WPBL.

The quarterly report will include a summary of site activities conducted in the previous quarter. It will also include a summary of conditions monitored along the WPBL during the preceding quarter in map, graphical, and/or tabular format, if applicable. At a minimum, this data will include groundwater elevation data, groundwater quality conditions, and presence/absence of LNAPL for monitoring conducted in accordance with the groundwater monitoring plan described in Section 4.4.1. Potentiometric surface maps and cross section(s) showing calculated groundwater gradient slopes and the property line for transects along the WPBL will be provided from wells gauged in the WPB during the preceding quarter for quarterly reports that include the Spring and Fall Monitoring Events data.

Activities summarized in the quarterly report are those taken within the flexibility offered by ASM. A completed Quarterly, Annual, and Five-Year Reporting Form (Appendix A8) must accompany the report. No response from Illinois EPA for each quarterly report is required or anticipated.

Five-Year Evaluation Report

A five-year evaluation report will be provided every 5 years starting December 31, 2024. The report will provide an evaluation of the remedy technologies implemented during the previous 5 years, and an evaluation determining if the transition to MNSZD and MNA in the WBPL is appropriate.

The Five-Year Evaluation Report will include a brief summary of the technologies implemented and conditions monitored during the preceding 5 years in map, graphical,

and/or tabular format. Monitoring data will be specific to bioventing and/or SVE, and will include a comparison to MNSZD and MNA effectiveness.

Activities summarized in the five-year evaluation report are those taken within the flexibility offered by ASM. A completed Quarterly, Annual, and Five-Year Reporting Form (Appendix A8) must accompany the report. No response from Illinois EPA for each five-year evaluation report is required or anticipated. Changes to the program will be proposed and documented in the appropriate report subject to Illinois EPA review and approval.

Illinois EPA Notification to Premcor

The Illinois EPA may submit a notification to request additional data/information from Premcor specifically to prevent insufficient data/information being available for the Illinois EPA to approve a closure request for the Facility. The notification must be made in writing to Premcor and include an explanation as to why such information is necessary and a requested timeline of the required information to be submitted for the Illinois EPA to review. A notification will be addressed by Premcor within the requested timeline, or a mutually agreed upon timeframe. If the additional information requested by Illinois EPA is found to be a necessary data/information in evaluating any of the reports that require Illinois EPA's pre-approval, as described within this section, then the time period between Illinois EPA's request and Premcor's submittal of the requested information will be added to the default timeframe of Illinois EPA's 180-day review period without Premcor's consent.

Metrics or Corrective Action Objectives Report

A CAOR would be submitted when additional site data allows for a CAO or site-specific metric to be established or modified. The CAOs may be defined via the TACO procedures or other procedures acceptable to both Premcor and the Illinois EPA, and be site-specific definitions, similar to the metrics described in Section 4.3.

The report will include:

- Applicable area(s) of the Facility;
- Applicable COCs;
- Applicable TACO option(s) and regulations or other procedures acceptable to both Premcor and the Illinois EPA;
- Quantitative threshold(s);
- Supporting information sufficient to establish how the metric or objective threshold was determined;
- Measurement standard based on industry standards, guidance, or methods outlined in peer reviewed journals, such as those defined in Section 1; and

- Conceptual design information to demonstrate that the proposed corrective measure is effective to achieve the planned CAOs and/or metrics in the CAOR, such as description of the corrective measure along with the general location.

Review and approval of the new or modified metric or objective from Illinois EPA is required within a mutually agreed upon timeframe, proposed within the report cover letter or body, and not to exceed 180 days. Illinois EPA may extend, for a specified period of time, the timeframe for a final response, if necessary, with a consent from Premcor (also see "Illinois EPA Notification to Premcor"). A completed Certification Form (Appendix A8) must accompany the report. If corrective action or controls are required, Premcor will facilitate the design and implementation of one or more of the presumptive remedies and/or controls within the structure of the overall Strategic Plan and tactical plans.

Preapproval Report

A preapproval report may be (but is not required to be) submitted in advance of conducting work as part of a presumptive remedy. The preapproval report provides a mechanism for Premcor to engage the Illinois EPA in the process for larger and/or more complex projects in advance. This approach is intended to ensure that work for such projects is performed within Illinois EPA rules and guidelines to minimize the potential for denial of any CMCR or closure request subsequently submitted for such projects.

Preapproval reports would typically be submitted for work plans or design reports for larger and/or more complex projects, at Premcor's discretion. The report will include sufficient information to document the scope of the proposed activities and specify the specific components where Premcor is requesting Illinois EPA review and approval.

Premcor will initiate the process by submitting the preapproval report in writing to the Illinois EPA. The Illinois EPA may respond either through a redline strikeout version or through written comments. If the Illinois EPA comments are substantive, Premcor and the Illinois EPA will have at least one meeting (web meeting or in person at the Illinois EPA office) to discuss the comments and aid in development of a collaborative solution. Illinois EPA and Premcor will mutually agree on a timeframe for response, proposed in the cover letter or body of the preapproval report, and not to exceed 180 days. Illinois EPA may extend, for a specified period of time, the timeframe for a final response, if necessary, with a consent from Premcor (also see "Illinois EPA Notification to Premcor"). A completed Certification Form (Appendix A8) must accompany the report.

This work would be documented in a CMCR.

Corrective Measures Completion Reports

A CMCR will be prepared when major milestones towards corrective action objectives and/or metrics have been achieved. The milestones when a CMCR will be submitted are:

- Shut down of IGC along the WPBL;
- Transition from bioventing and/or SVE to MNA and MNSZD along the WPBL;
- Achievement of hydraulic recovery metrics (Table 6) sitewide;
- Achievement of LNAPL MEP (Table 7) sitewide; and
- Completion of a non-presumptive remedy as specified in a design plan and/or modification report.

The report will document the efforts carried out as part of implementing the corrective measures and demonstrating, as appropriate, that the approved CAOs and/or metrics have been achieved, including completion of work outlined in a modification report and/or design plan. The report will include:

- A brief summary of activities that have been performed, relevant to each remediation objective;
- Analytical test results, including quality assurance/quality control test results and identification of any test results that did not meet the specified value and a description of the action taken in response to this failure, including retesting efforts;
- Tabular, graphical, and/or map-based summaries of the corrective action activities performed and associated monitoring data;
- Trend analysis demonstrations of attainment of closure and/or remedy decision points, where applicable;
- Summary of site status;
- Photograph(s) documenting the various stages of construction, as applicable; and
- Content specified in an associated modification report and/or design plan.

Review and approval of the CMCR by Illinois EPA is required for Premcor to consider the response complete, as shown in the Strategic Plan (Figure 15). A CMCR provides the Illinois EPA the opportunity to disagree with actions taken by Premcor. At such time a Modification Process can be initiated (Section 4.5).

Design Plan

A design plan will be prepared for constructed controls that do not have performance metrics discussed in this Strategic Plan. The design plan will include sufficient information to demonstrate that the control is effective to achieve the planned CAOs and/or metrics approved by Illinois EPA in the CAOR, and/or institutional controls to prevent the migration of contaminants from the area of concern. The plan will include:

- The applicable CAOs, metrics, and/or remedy decision points;
- Specifications, calculations, and/or drawings sufficient to demonstrate the constructed control is effective;
- Description of the management strategy; and
- Operation and management procedures, which also include a list of required permits, overview of construction schedule, standard operating procedures, and inspection and contingency procedures.

A completed Certification Form (Appendix A8) must accompany the report.

Review and approval of the design plan by Illinois EPA is required. Premcor will initiate the process by submitting the design plan in writing to the Illinois EPA. The Illinois EPA may respond either through a redline strikeout version or through written comments. If the Illinois EPA comments are substantive, Premcor and the Illinois EPA will have at least one meeting (web meeting or in person at the Illinois EPA office) to discuss the comments and aid in development of a collaborative solution. Illinois EPA and Premcor will mutually agree on a timeframe for response, proposed in the cover letter or body of the design report, and not to exceed 180 days.

Notification to Illinois EPA

A notification will be provided to the Illinois EPA for the events or site conditions described below. The intent of these notifications is to inform the Illinois EPA, in a timely manner, of the status of the IGC system as well as to provide adequate notification of site activities should the Illinois EPA choose to plan a site visit.

When pumping is required to maintain IGC, a notification will be sent to the Illinois EPA for the IGC equipment or wastewater treatment plant if there is malfunctioning equipment or equipment offline for a duration greater than 24 hours that could potentially impact hydraulic control. The notification will be sent within 30 days of the event. The resolution will be provided in the next quarterly or annual report, whichever comes first.

If the results of an evaluation of IGC conducted per Table 3 indicate that inward gradient is not present in the uppermost aquifer, a notification will be sent to the Illinois EPA within 30 days of making the determination. The resolution or the projected work to restore inward gradient will be included in the notification.

A notification will be provided to Illinois EPA in advance of non-routine scheduled activities including:

- Conducting subsurface soil or sediment investigations;
- Startup of a new non-presumptive remedy; or

- A major remedy-related construction activity.

The notification is intended to indicate when the activity is taking place. If the Illinois EPA determines that sufficient lead time was not provided to plan a site visit, Illinois EPA and Premcor will mutually agree on an alternate date.

No response from Illinois EPA for each notification is required or anticipated.

4.5 MODIFICATION PROCESS

Both Illinois EPA and Premcor reserve the ability to propose modifications to this Strategic Plan. Proposed modifications shall be communicated in writing between the Illinois EPA and Premcor for response and comment. Both parties must approve the modifications for the Strategic Plan in writing. Upon approval by both parties, the Strategic Plan will be revised and updated accordingly. If a consensus cannot be achieved, either party may choose to initiate Dispute Resolution, Section X.B. of the Consent Order, for a final determination.

The parties agree the Strategic Plan complies with applicable laws and regulations of the State of Illinois. If, subsequent to entering the Consent Order, the applicable laws and regulations of the State of Illinois, and specifically the risk-based requirements of 35 Illinois Adm. Code Part 742 (TACO), are modified, revised, or otherwise changed, either Premcor or the Illinois EPA may request to modify or update the Strategic Plan to satisfy the changes to the applicable laws and regulations of the State of Illinois. Such notification shall be in writing between the Illinois EPA and Premcor, and specifically identify the change in regulation, the portion of the Strategic Plan affected by such change, and the proposed or requested change to satisfy the regulation(s). Within a mutually agreed upon timeframe following such notification, and not to exceed 180 days, the party in receipt of the notification shall either confirm its acceptance of the proposed modification in writing, or submit any comments on and/or revisions to the proposed modification. If the proposed modification is accepted, it shall become part of the Strategic Plan pursuant to this Section 1.1. If the proposed modification is not accepted, the parties shall meet and confer within a mutually agreed upon timeframe, not to exceed 180 days, to reach a resolution. The party in receipt may extend for a specified period of time for a final response, if necessary, with a consent from the other party. Any disputes arising under this paragraph shall be handled pursuant to the Dispute Resolution Section of the Consent Order.

Illinois EPA also reserves the right to require changes to Premcor's implementation of this Strategic Plan within the flexibility of ASM. To enforce a change to Premcor's implementation, Illinois EPA must provide documentation that:

- Site data demonstrates that a risk to human health and the environment is present and not being addressed;

- Insufficient site data to meet applicable TACO regulations, is being collected to adequately characterize protection of human health and the environment; or
- Site data demonstrates that progress toward the CAOs is not in accordance with the Strategic Plan, and an appropriate plan is not in place to address the necessary changes.

Modification Report

Proposed modifications to this Strategic Plan by Premcor will be submitted in the form of a modification report. The modification report will include all relevant sections of the Strategic Plan for modification and redline strikeout text that highlights the specific modifications. Modification reports would typically be submitted to introduce a new presumptive remedy or to update operational processes and procedures.

Review and approval of the modification report by the Illinois EPA is required for the modification to be complete and the Strategic Plan to be updated. Upon Illinois EPA approval, Premcor will submit one paper copy and electronic submission, plus additional paper copies upon request of the full, revised document to the Illinois EPA. Illinois EPA and Premcor will mutually agree on a timeframe for response, proposed in the cover letter or body of the modification report, and not to exceed 180 days. Illinois EPA may extend for a specified period of time for a final response, if necessary, with a consent from Premcor (see also "Illinois EPA Notification to Premcor").

5. TRANSITION PLAN

As a result of ongoing activities and/or pending report and plan approvals for specific tasks from Illinois EPA, a plan to incorporate initial response activities and transition from the draft Consent Order (2007) process to this final Strategic Plan approach is necessary. Section 5.1 summarizes all current reports or plans that have been submitted to Illinois EPA and are awaiting approval. Section 5.2 summarizes all approved reports or plans from Illinois EPA that are awaiting completion. Section 5.3 summarizes all approved reports or plans that will be superseded by this Strategic Plan. Section 5.4 summarizes compliance of this Strategic Plan with the draft Consent Order (2007) Appendices B and C.

This Strategic Plan is intended to replace or incorporate, as noted herein, all other plans and corrective action activities planned and/or ongoing at the Facility into a single, final remedial action plan designed to achieve a permanent remedy.

5.1 DOCUMENTS AWAITING ILLINOIS EPA REVIEW AND APPROVAL

Documents that have been submitted for Illinois EPA review and approval include:

- Document 1 – Path Forward Approach to River Dock Area Sediments, Premcor Facility (Appendix A3);
- Document 2 – Corrective Action Objectives Report, Main Facility East Partial Closure Area;
- Document 3 – Corrective Action Objectives Report, River Dock Area Partial Closure Area;
- Document 4 – Corrective Action Objectives Report, South Property Partial Closure Area;

Illinois EPA has provided general comments on Documents 1 through 4 through written correspondence and/or meetings. Premcor will submit revised versions of each document for Illinois EPA review and approval.

Documents 1 through 4 are incorporated by reference into this Strategic Plan and will be implemented as written upon receipt of written approval from Illinois EPA, subject to consistency of any approval conditions with this Strategic Plan. In the event of any conflicts, this Strategic Plan will be the controlling document.

5.2 ILLINOIS EPA APPROVED DOCUMENTS AWAITING COMPLETION

Documents previously approved by Illinois EPA and awaiting completion include:

- Document 5 – Group 3 Groundwater Investigation Work Plan (submitted October 29, 2015; approved by Illinois EPA August 1, 2017)

Document 5 will be completed as planned.

5.3 DOCUMENTS TO BE SUPERSEDED

Approved documents to be superseded by this Strategic Plan include:

- Letter Re: LFDPE System – Changing Mode of Operation (submitted November 24, 2014)
- Western Property Boundary Free Product Recovery Enhancement Low-Flow Dual Phase Extraction Operation and Maintenance Plan (submitted June 13, 2008)
- Interim Measures Western Property Boundary and RMW-35 Expansion Area SVE System Operation and Maintenance Plan Rev. 03 (submitted May 13, 2010)
- Basis of Design for Site Wide Management of Free Product (submitted October 26, 2012)
- Response Action Plan for Groundwater Inward Gradient Control - Revision 4 (submitted July 10, 2013)
- Revision No. 3 of the Groundwater Monitoring Plan (submitted May 31, 2013)

Documents awaiting approval to be superseded by this Strategic Plan include:

- Final Design Report for Management of Free Product in Districts 1A and 1B, Volumes 1 and 2 (submitted February 25, 2016)

Elements of these documents to be carried forward are addressed in Appendix A6.

5.4 DRAFT CONSENT ORDER CONCURRENCE

Appendix A1 details the concurrence of this Strategic Plan with Appendices B and C of the draft Consent Order (2007), and where requirements have already been satisfied. The Strategic Plan is designed to meet the requirements of Appendices B and C of the draft Consent Order (2007) and TACO.

5.5 TRANSITION REPORTING

Transition reporting will apply during the transition between the draft Consent Order (2007) and the final Consent Order and this Strategic Plan approach. Routine reports include:

- Quarterly Reporting; and
- Annual Reporting.

These reports will have the formats as described in Section 4.4.2 of this Strategic Plan. Non-routine reports will be limited to those instances where Illinois EPA review and approval is necessary in order to progress forward. Examples may include, but are not necessarily limited to:

- CAORs;
- Sediment Risk-Based Closure Evaluation Reports;
- Engineering Control Design Reports;
- CMCRs;
- Modification to Strategic Plan; and
- Preapproval reports.

The content and approach to such reports is generally specified in Section 4.4.2 of this Strategic Plan.

6. SUMMARY

Premcor will continue to work collaboratively with the Illinois EPA to protect human health and the environment regarding the Facility by:

- Implementing ASM principles within applicable Illinois regulatory programs;
- Streamlining management and reporting; and
- Specifying procedures, quantitative metrics, and thresholds for those metrics inherent to risk-based remediation programs, developed in accordance with the Illinois EPA's TACO and U.S. EPA or other guidance documents that are acceptable to Illinois EPA, to provide clear, measurable, and attainable objectives and targets for corrective action.

The general Strategic Plan approach, within Illinois EPA regulatory programs, is presented in Figure 29. As previously noted in Section 1, this Strategic Plan supersedes and/or incorporates, as noted herein, all other plans and corrective action activities planned and/or ongoing at the Facility. To this end, Appendix A1 includes a tabular comparison of initial response action progress relating to the work outlined in Appendices B and C of the draft Consent Order (2007).

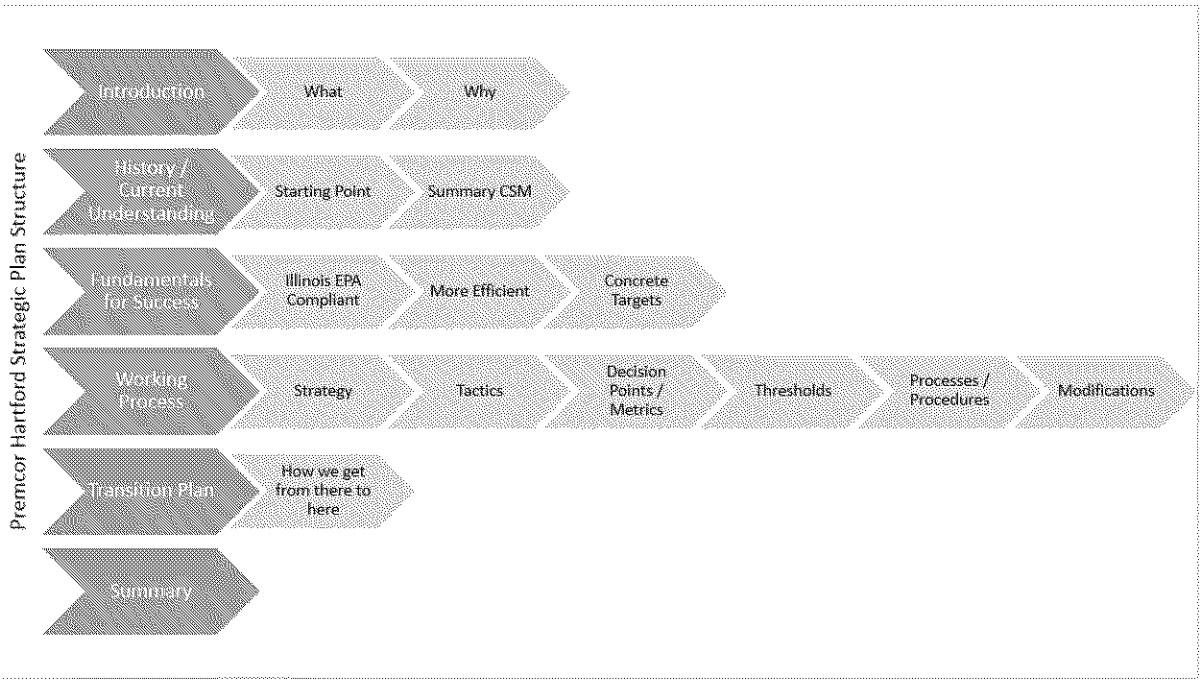


Figure 29 Overview of the general Strategic Plan approach.

Protection of human health and the environment will be driven by measured data and evaluations of measured data for the Facility within the context of scientific understanding of

the COCs at the Facility in accordance with the applicable laws and regulations of the State of Illinois. This Strategic Plan represents the science-based and risk-based consensus approach developed jointly by Illinois EPA and Premcor to efficiently and effectively protect human health and the environment.

7. REFERENCES

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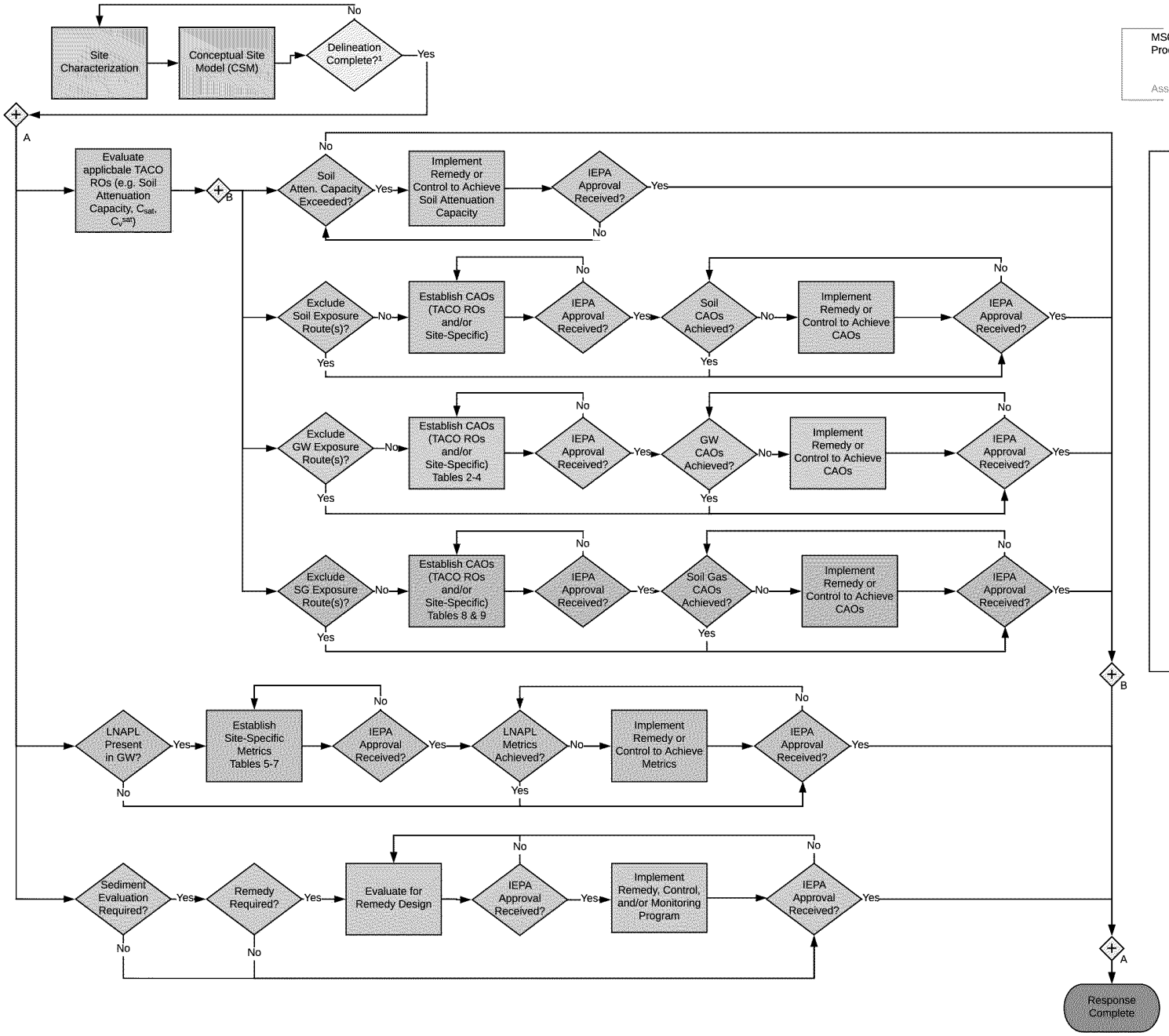
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Figures

Premcor Hartford Progression through Corrective Action Process



MS01: Premcor Hartford Strategic Plan - Progression through Corrective Action Process

Assumption: Only chronic (no acute) concerns exist

Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program (35 Ill. Adm. Code 724). Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).

Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, technical impracticability demonstration or any other program allowable under the TACO regulation.

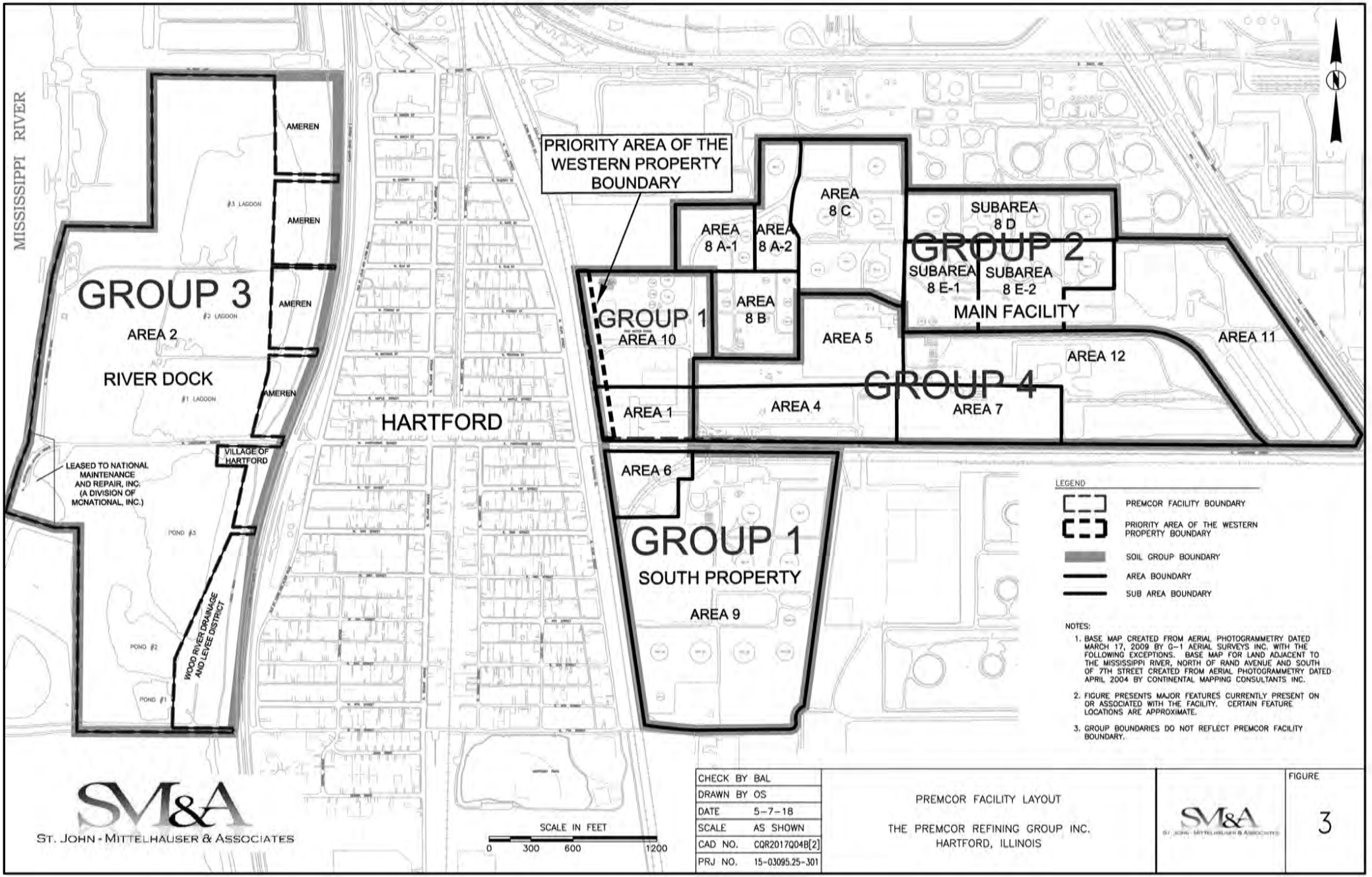
Z - Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.

1 - Site characterization, integration of data into the conceptual site model, and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion, and/or as required by the Illinois EPA, to enhance the conceptual site model and proceed to the next stage of the process.

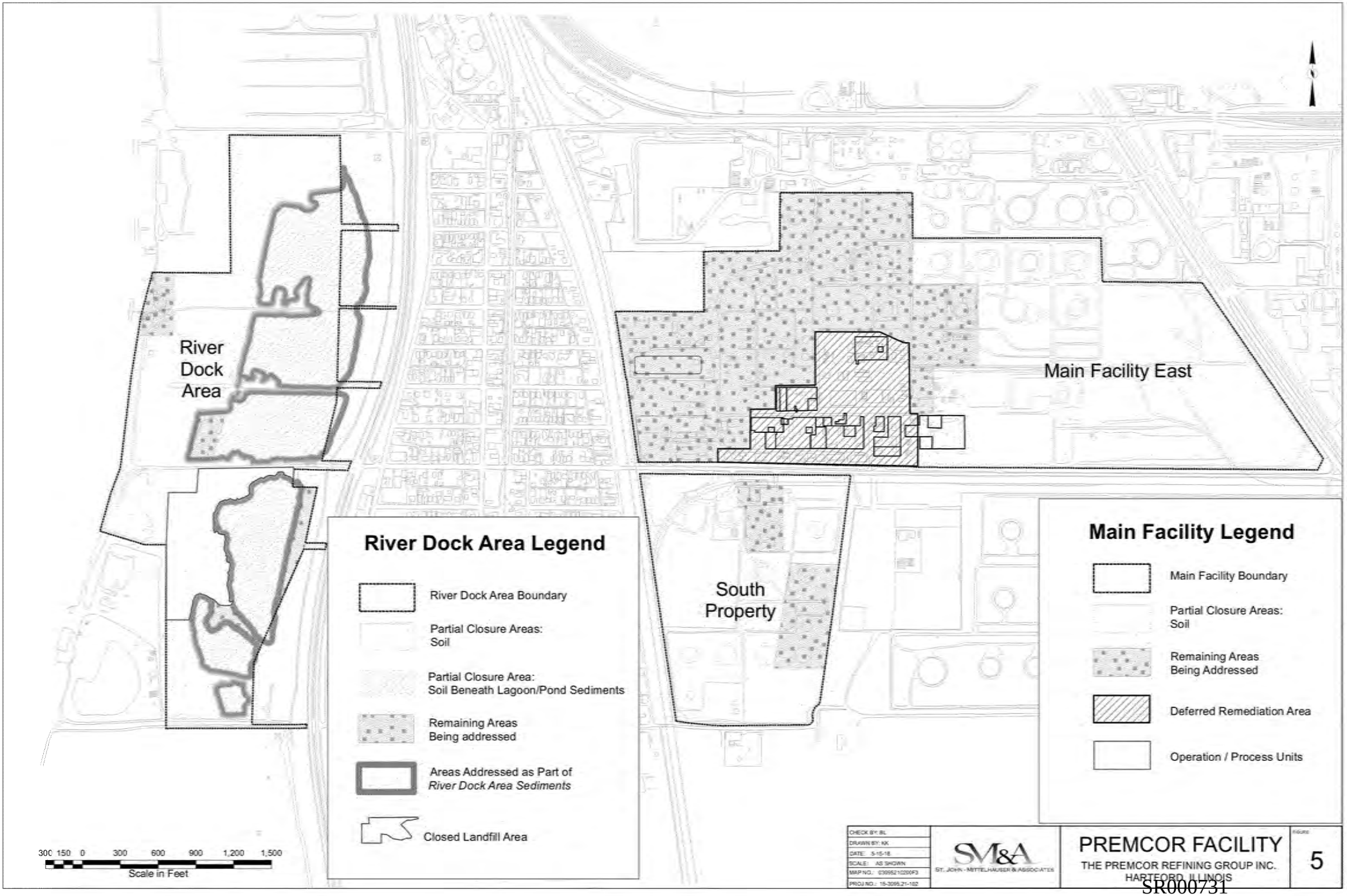
Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
CO - Sediment Cleanup Objective
C_{sat} - Soil Saturation Limit
C_v^{sat} - Soil Vapor Saturation Limit
CSM - Conceptual Site Model
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
LNAPL - Light Non-Aqueous Phase Liquid
RO - Remediation Objective
SG - Soil Gas
SSV - Sediment Screening Value
TACO - 35 Illinois Administrative Code Part 742 (Tiered Approach to Cleanup Objectives)

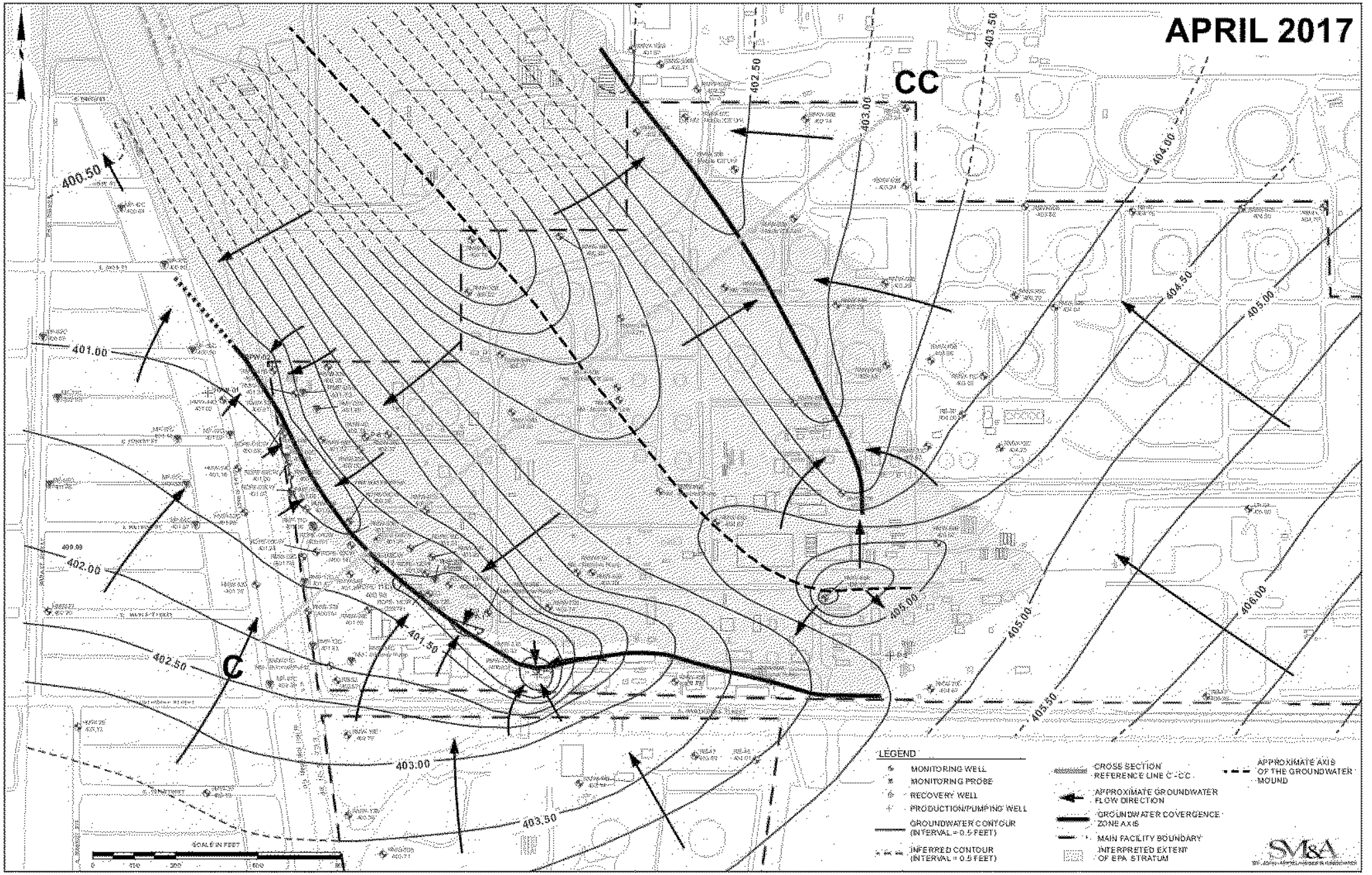
GEI Consultants

SR000729

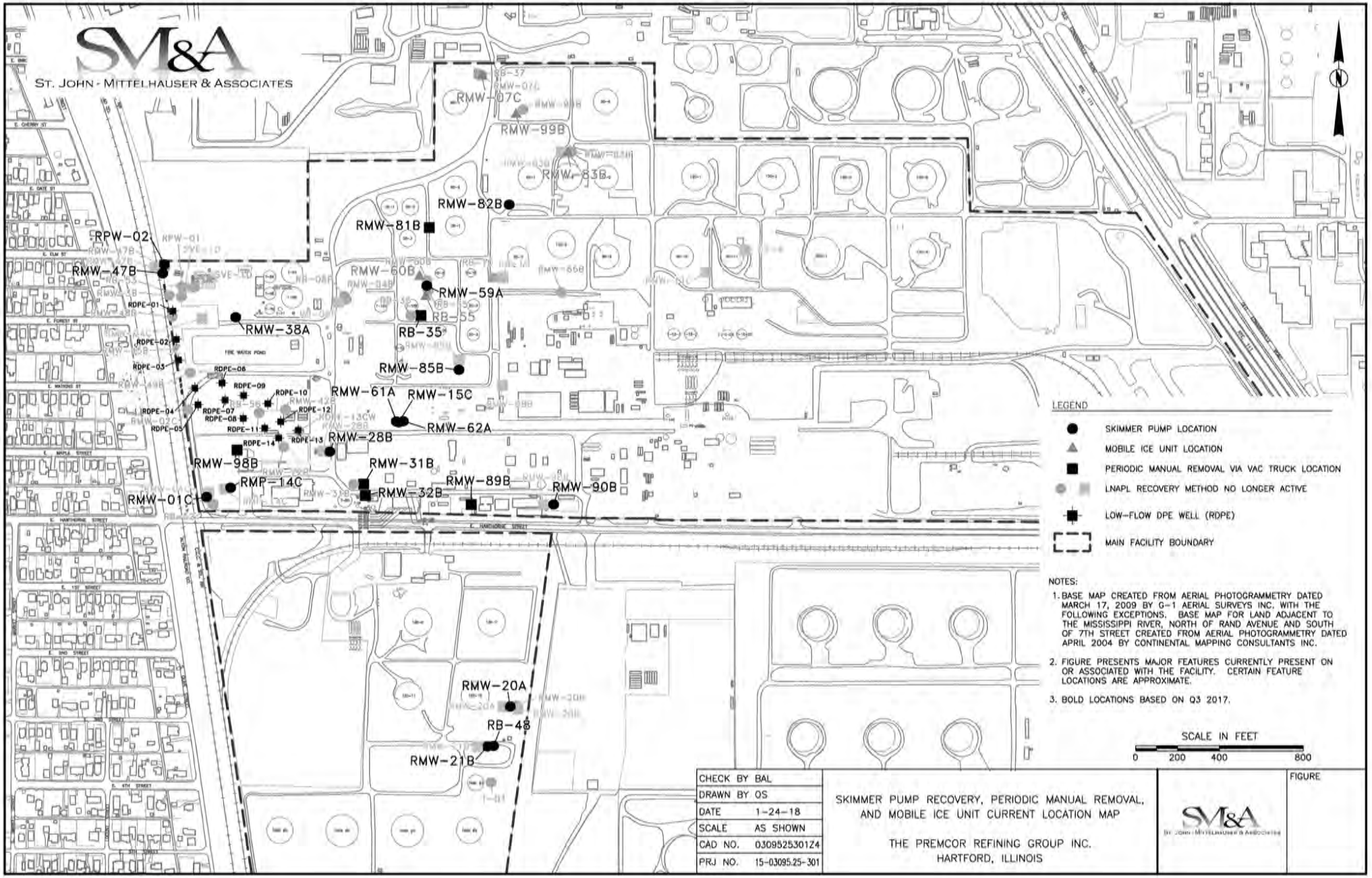

MISSISSIPPI RIVER
PRIORITY AREA OF THE WESTERN PROPERTY BOUNDARY
AMEREN
AMEREN
AMEREN
AMEREN
#3 LAGOON
#2 LAGOON
#1 LAGOON
GROUP 3
AREA 2
RIVER DOCK
HARTFORD
VILLAGE OF HARTFORD
LEASED TO NATIONAL MAINTENANCE AND REPAIR, INC. (A DIVISION OF MCNATIONAL, INC.)
POND #3
POND #2
POND #1
WOOD RIVER DRAINAGE AND LEVEE DISTRICT
AREA 8 A-1
AREA 8 A-2
AREA 8 C
SUBAREA 8 D
GROUP 2
SUBAREA 8 E-1
SUBAREA 8 E-2
MAIN FACILITY
GROUP 1
AREA 10
AREA 8 B
AREA 5
AREA 11
AREA 12
GROUP 4
AREA 1
AREA 4
AREA 7
AREA 6
GROUP 1
SOUTH PROPERTY
AREA 9
LEGEND
PREMCOR FACILITY BOUNDARY
PRIORITY AREA OF THE WESTERN PROPERTY BOUNDARY
SOIL GROUP BOUNDARY
AREA BOUNDARY
SUB AREA BOUNDARY
NOTES:
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2009 BY G-1 AERIAL SURVEYS INC. WITH THE FOLLOWING EXCEPTIONS. BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC.
2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. CERTAIN FEATURE LOCATIONS ARE APPROXIMATE.
3. GROUP BOUNDARIES DO NOT REFLECT PREMCOR FACILITY BOUNDARY.
SCALE IN FEET
0 300 600 1200
SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES
CHECK BY BAL
DRAWN BY OS
DATE 5-7-18
SCALE AS SHOWN
CAD NO. CQR2017Q04B[2]
PRJ NO. 15-03095.25-301
PREMCOR FACILITY LAYOUT
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES
FIGURE
3

SR000730

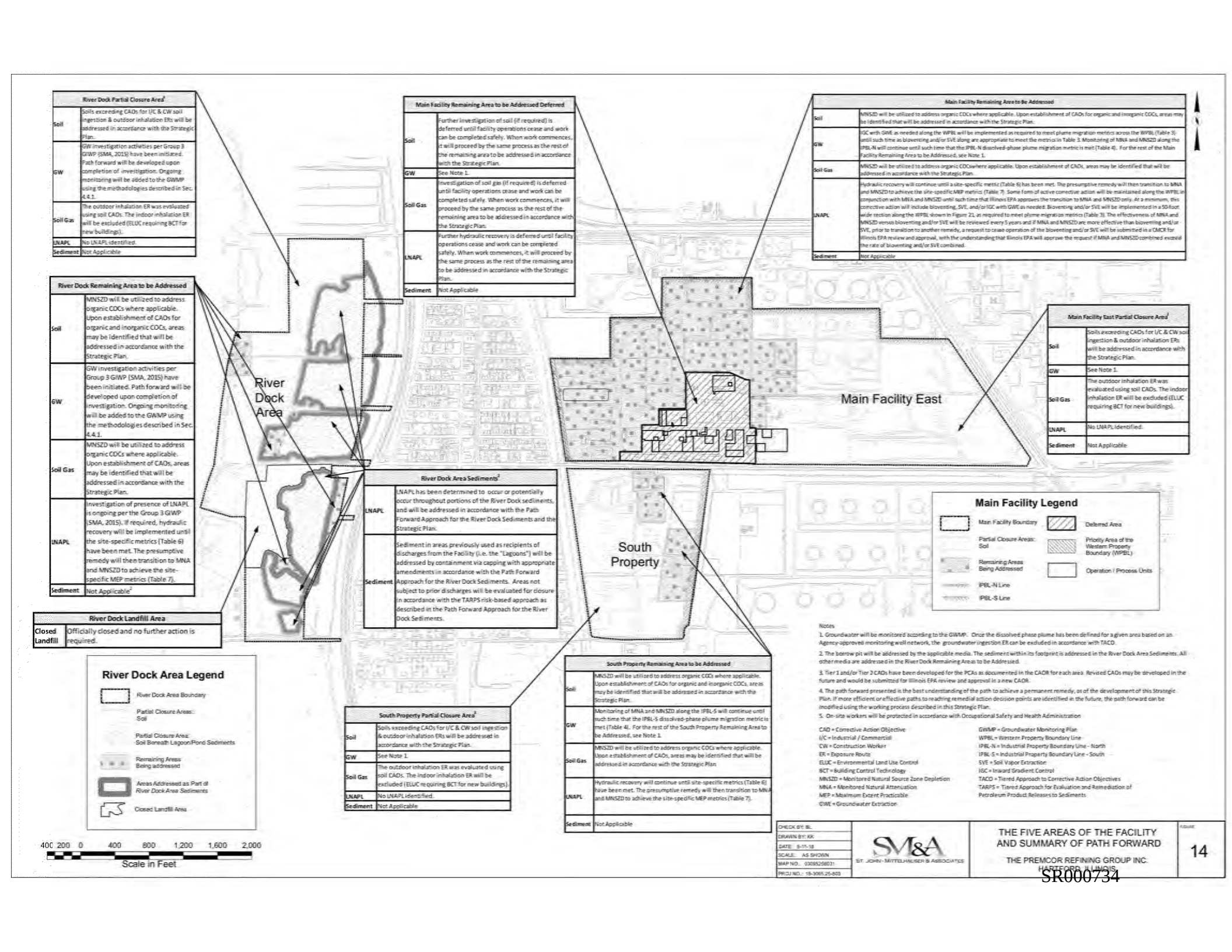

River
Dock
Area
Main Facility East
South
Property
River Dock Area Legend
River Dock Area Boundary
Partial Closure Areas:
Soil
Partial Closure Area:
Soil Beneath Lagoon/Pond Sediments
Remaining Areas
Being addressed
Areas Addressed as Part of
River Dock Area Sediments
Closed Landfill Area
Main Facility Legend
Main Facility Boundary
Partial Closure Areas:
Soil
Remaining Areas
Being Addressed
Deferred Remediation Area
Operation / Process Units
300 150 0 300 600 900 1,200 1,500
Scale in Feet
CHECK BY: BL
DRAWN BY: KK
DATE: 5-15-18
SCALE: AS SHOWN
MAP NO.: 039952102000F3
PROJ NO.: 15-3095.21-102
SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES
PREMCOR FACILITY
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
FIGURE
5

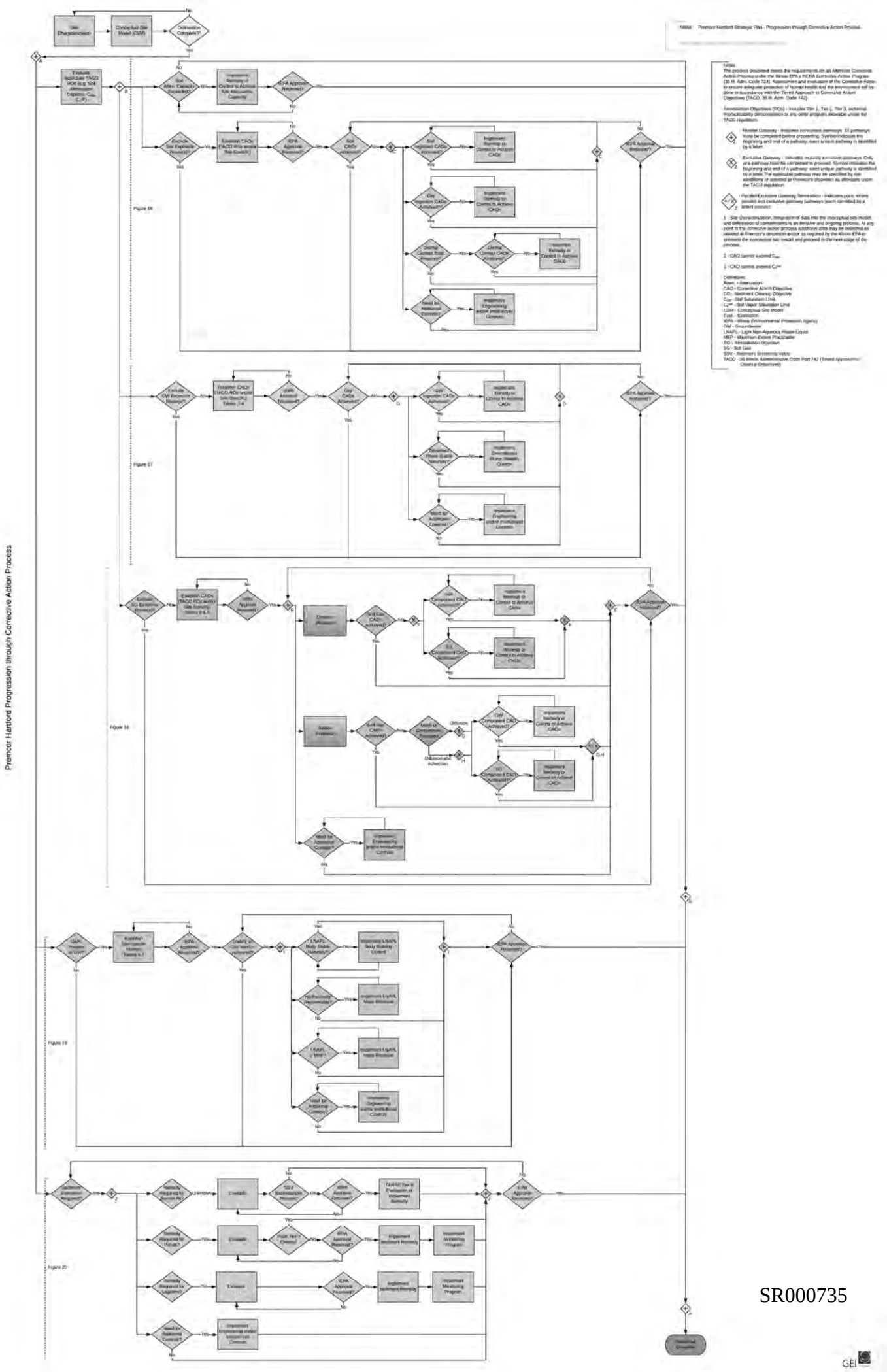

APRIL 2017
CC
C
400.50
401.00
402.00
402.50
403.00
403.50
404.00
404.50
405.00
406.00
LEGEND
MONITORING WELL
MONITORING PROBE
RECOVERY WELL
PRODUCTION/PUMPING WELL
GROUNDWATER CONTOUR (INTERVAL = 0.5 FEET)
INFERRED CONTOUR (INTERVAL = 0.5 FEET)
CROSS SECTION REFERENCE LINE C - CC'
APPROXIMATE GROUNDWATER FLOW DIRECTION
GROUNDWATER CONVERGENCE ZONE AXIS
MAIN FACILITY BOUNDARY
INTERPRETED EXTENT OF EPA STRATUM
APPROXIMATE AXIS OF THE GROUNDWATER MOUND
SCALE IN FEET
SV&A

SR000732


SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES
RMW-07C
RMW-99B
RMW-83B
RMW-82B
RMW-81B
RPW-02
RMW-47B
RMW-60B
RMW-59A
RB-55
RB-35
RMW-38A
RMW-85B
RMW-61A
RMW-15C
RMW-62A
RMW-28B
RMW-98B
RMW-31B
RMW-89B
RMW-90B
RMP-14C
RMW-32B
RMW-01C
RMW-20A
RB-48
RMW-21B
RDPE-01
RDPE-02
RDPE-03
RDPE-04
RDPE-05
RDPE-06
RDPE-07
RDPE-08
RDPE-09
RDPE-10
RDPE-11
RDPE-12
RDPE-13
RDPE-14
LEGEND
SKIMMER PUMP LOCATION
MOBILE ICE UNIT LOCATION
PERIODIC MANUAL REMOVAL VIA VAC TRUCK LOCATION
LNAPL RECOVERY METHOD NO LONGER ACTIVE
LOW-FLOW DPE WELL (RDPE)
MAIN FACILITY BOUNDARY
NOTES:
1. BASE MAP CREATED FROM AERIAL PHOTOGRAMMETRY DATED MARCH 17, 2009 BY G-1 AERIAL SURVEYS INC. WITH THE FOLLOWING EXCEPTIONS. BASE MAP FOR LAND ADJACENT TO THE MISSISSIPPI RIVER, NORTH OF RAND AVENUE AND SOUTH OF 7TH STREET CREATED FROM AERIAL PHOTOGRAMMETRY DATED APRIL 2004 BY CONTINENTAL MAPPING CONSULTANTS INC.
2. FIGURE PRESENTS MAJOR FEATURES CURRENTLY PRESENT ON OR ASSOCIATED WITH THE FACILITY. CERTAIN FEATURE LOCATIONS ARE APPROXIMATE.
3. BOLD LOCATIONS BASED ON Q3 2017.
SCALE IN FEET
0 200 400 800
CHECK BY BAL
DRAWN BY OS
DATE 1-24-18
SCALE AS SHOWN
CAD NO. 0309525301Z4
PRJ NO. 15-03095.25-301
SKIMMER PUMP RECOVERY, PERIODIC MANUAL REMOVAL, AND MOBILE ICE UNIT CURRENT LOCATION MAP
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
SM&A
FIGURE

SR000733


River Dock Partial Closure Area[3]
Soil: Soils exceeding CAOs for I/C & CW soil ingestion & outdoor inhalation ERs will be addressed in accordance with the Strategic Plan.
GW: GW investigation activities per Group 3 GIWP (SMA, 2015) have been initiated. Path forward will be developed upon completion of investigation. Ongoing monitoring will be added to the GWMP using the methodologies described in Sec. 4.4.1.
Soil Gas: The outdoor inhalation ER was evaluated using soil CAOs. The indoor inhalation ER will be excluded (ELUC requiring BCT for new buildings).
LNAPL: No LNAPL identified.
Sediment: Not Applicable
River Dock Remaining Area to be Addressed
Soil: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs for organic and inorganic COCs, areas may be identified that will be addressed in accordance with the Strategic Plan.
GW: GW investigation activities per Group 3 GIWP (SMA, 2015) have been initiated. Path forward will be developed upon completion of investigation. Ongoing monitoring will be added to the GWMP using the methodologies described in Sec. 4.4.1.
Soil Gas: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs, areas may be identified that will be addressed in accordance with the Strategic Plan.
LNAPL: Investigation of presence of LNAPL is ongoing per the Group 3 GIWP (SMA, 2015). If required, hydraulic recovery will be implemented until the site-specific metrics (Table 6) have been met. The presumptive remedy will then transition to MNA and MNSZD to achieve the site-specific MEP metrics (Table 7).
Sediment: Not Applicable[2]
River Dock Landfill Area
Closed Landfill: Officially closed and no further action is required.
Main Facility Remaining Area to be Addressed Deferred
Soil: Further investigation of soil (if required) is deferred until facility operations cease and work can be completed safely. When work commences, it will proceed by the same process as the rest of the remaining area to be addressed in accordance with the Strategic Plan.
GW: See Note 1.
Soil Gas: Investigation of soil gas (if required) is deferred until facility operations cease and work can be completed safely. When work commences, it will proceed by the same process as the rest of the remaining area to be addressed in accordance with the Strategic Plan.
LNAPL: Further hydraulic recovery is deferred until facility operations cease and work can be completed safely. When work commences, it will proceed by the same process as the rest of the remaining area to be addressed in accordance with the Strategic Plan.
Sediment: Not Applicable
River Dock Area Sediments[2]
LNAPL: LNAPL has been determined to occur or potentially occur throughout portions of the River Dock sediments, and will be addressed in accordance with the Path Forward Approach for the River Dock Sediments and the Strategic Plan.
Sediment: Sediment in areas previously used as recipients of discharges from the Facility (i.e. the "Lagoons") will be addressed by containment via capping with appropriate amendments in accordance with the Path Forward Approach for the River Dock Sediments. Areas not subject to prior discharges will be evaluated for closure in accordance with the TARPS risk-based approach as described in the Path Forward Approach for the River Dock Sediments.
South Property Partial Closure Area[3]
Soil: Soils exceeding CAOs for I/C & CW soil ingestion & outdoor inhalation ERs will be addressed in accordance with the Strategic Plan.
GW: See Note 1.
Soil Gas: The outdoor inhalation ER was evaluated using soil CAOs. The indoor inhalation ER will be excluded (ELUC requiring BCT for new buildings)
LNAPL: No LNAPL identified.
Sediment: Not Applicable
South Property Remaining Area to be Addressed
Soil: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs for organic and inorganic COCs, areas may be identified that will be addressed in accordance with the Strategic Plan.
GW: Monitoring of MNA and MNSZD along the IPBL-S will continue until such time that the IPBL-S dissolved-phase plume migration metric is met (Table 4). For the rest of the South Property Remaining Area to be Addressed, see Note 1.
Soil Gas: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs, areas may be identified that will be addressed in accordance with the Strategic Plan
LNAPL: Hydraulic recovery will continue until site-specific metrics (Table 6) have been met. The presumptive remedy will then transition to MNA and MNSZD to achieve the site-specific MEP metrics (Table 7).
Sediment: Not Applicable
Main Facility Remaining Area to Be Addressed
Soil: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs for organic and inorganic COCs, areas may be identified that will be addressed in accordance with the Strategic Plan.
GW: IGC with GWE as needed along the WPBL will be implemented as required to meet plume migration metrics across the WPBL (Table 3) until such time as bioventing and/or SVE along are appropriate to meet the metrics in Table 3. Monitoring of MNA and MNSZD along the IPBL-N will continue until such time that the IPBL-N dissolved-phase plume migration metric is met (Table 4). For the rest of the Main Facility Remaining Area to be Addressed, see Note 1.
Soil Gas: MNSZD will be utilized to address organic COCs where applicable. Upon establishment of CAOs, areas may be identified that will be addressed in accordance with the Strategic Plan.
LNAPL: Hydraulic recovery will continue until a site-specific metric (Table 6) has been met. The presumptive remedy will then transition to MNA and MNSZD to achieve the site-specific MEP metrics (Table 7). Some form of active corrective action will be maintained along the WPBL in conjunction with MNA and MNSZD until such time that Illinois EPA approves the transition to MNA and MNSZD only. At a minimum, this corrective action will include bioventing, SVE, and/or IGC with GWE as needed. Bioventing and/or SVE will be implemented in a 50-foot wide section along the WPBL shown in Figure 21, as required to meet plume migration metrics (Table 3). The effectiveness of MNA and MNSZD versus bioventing and/or SVE will be reviewed every 5 years and if MNA and MNSZD are more effective than bioventing and/or SVE, prior to transition to another remedy, a request to cease operation of the bioventing and/or SVE will be submitted in a CMCR for Illinois EPA review and approval, with the understanding that Illinois EPA will approve the request if MNA and MNSZD combined exceed the rate of bioventing and/or SVE combined.
Sediment: Not Applicable
Main Facility East Partial Closure Area[3]
Soil: Soils exceeding CAOs for I/C & CW soil ingestion & outdoor inhalation ERs will be addressed in accordance with the Strategic Plan.
GW: See Note 1.
Soil Gas: The outdoor inhalation ER was evaluated using soil CAOs. The indoor inhalation ER will be excluded (ELUC requiring BCT for new buildings).
LNAPL: No LNAPL identified.
Sediment: Not Applicable
River Dock Area
Main Facility East
South Property
Main Facility Legend
Main Facility Boundary
Partial Closure Areas: Soil
Remaining Areas Being Addressed
IPBL-N Line
IPBL-S Line
Deferred Area
Priority Area of the Western Property Boundary (WPBL)
Operation / Process Units
River Dock Area Legend
River Dock Area Boundary
Partial Closure Areas: Soil
Partial Closure Area: Soil Beneath Lagoon/Pond Sediments
Remaining Areas Being addressed
Areas Addressed as Part of River Dock Area Sediments
Closed Landfill Area
400 200 0 400 800 1,200 1,600 2,000
Scale in Feet
Notes
1. Groundwater will be monitored according to the GWMP. Once the dissolved phase plume has been defined for a given area based on an Agency-approved monitoring well network, the groundwater ingestion ER can be excluded in accordance with TACO.
2. The borrow pit will be addressed by the applicable media. The sediment within its footprint is addressed in the River Dock Area Sediments. All other media are addressed in the River Dock Remaining Areas to be Addressed.
3. Tier 1 and/or Tier 2 CAOs have been developed for the PCAs as documented in the CAOR for each area. Revised CAOs may be developed in the future and would be submitted for Illinois EPA review and approval in a new CAOR.
4. The path forward presented is the best understanding of the path to achieve a permanent remedy, as of the development of this Strategic Plan. If more efficient or effective paths to reaching remedial action decision points are identified in the future, the path forward can be modified using the working process described in this Strategic Plan.
5. On-site workers will be protected in accordance with Occupational Safety and Health Administration
CAO = Corrective Action Objective
I/C = Industrial / Commercial
CW = Construction Worker
ER = Exposure Route
ELUC = Environmental Land Use Control
BCT = Building Control Technology
MNSZD = Monitored Natural Source Zone Depletion
MNA = Monitored Natural Attenuation
MEP = Maximum Extent Practicable
GWE = Groundwater Extraction
GWMP = Groundwater Monitoring Plan
WPBL = Western Property Boundary Line
IPBL-N = Industrial Property Boundary Line - North
IPBL-S = Industrial Property Boundary Line - South
SVE = Soil Vapor Extraction
IGC = Inward Gradient Control
TACO = Tiered Approach to Corrective Action Objectives
TARPS = Tiered Approach for Evaluation and Remediation of Petroleum Product Releases to Sediments
CHECK BY: BL
DRAWN BY: KK
DATE: 5-11-18
SCALE: AS SHOWN
MAP NO.: 0309525803I
PROJ NO.: 18-3065.25-803
SM&A
ST. JOHN-MITTELHAUSER & ASSOCIATES
THE FIVE AREAS OF THE FACILITY AND SUMMARY OF PATH FORWARD
THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS
FIGURE
14


Premcor Hartford Progression through Corrective Action Process
Title: Premcor Hartford Strategic Plan - Progression through Corrective Action Process
Notes:
The process described meets the requirements for an Alternate Corrective Action Process under the Illinois EPA's RCRA Corrective Action Program [35 Ill. Adm. Code 724]. Assessment and evaluation of the Corrective Action to ensure adequate protection of human health and the environment will be done in accordance with the Tiered Approach to Corrective Action Objectives (TACO, 35 Ill. Adm. Code 742).
Remediation Objectives (ROs) - Includes Tier 1, Tier 2, Tier 3, exclusive, or practicability demonstration or any other program allowable under the TACO regulation.
Parallel Gateway - Indicates concurrent pathways. All pathways must be completed before proceeding. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter.
Exclusive Gateway - Indicates mutually exclusive pathways. Only one pathway must be completed to proceed. Symbol indicates the beginning and end of a pathway; each unique pathway is identified by a letter. The applicable pathway may be specified by risk conditions or selected at Premcor's discretion as allowable under the TACO regulation.
Parallel Exclusive Gateway Termination - Indicates joint, where parallel and exclusive gateway pathways (each identified by a letter) reconnect.
1. Site Characterization, Integration of data into the conceptual site model and delineation of contaminants is an iterative and ongoing process. At any point in the corrective action process additional data may be collected as needed at Premcor's discretion and/or as required by the Illinois EPA to optimize the conceptual site model and proceed to the next stage of the process.
1 - CAO cannot exceed C_{sat}.
1 - CAO cannot exceed C_s.
Definitions:
Atten. - Attenuation
CAO - Corrective Action Objective
CO - Treatment Cleanup Objective
C_{sat} - Soil Saturation Limit
C_s - Soil Vapor Saturation Limit
CSM - Conceptual Site Model
Evac - Evacuation
IEPA - Illinois Environmental Protection Agency
GW - Groundwater
LNAPL - Light Non-Aqueous Phase Liquid
MEP - Maximum Extent Practicable
RO - Remediation Objective
SG - Soil Gas
SSV - Sediment Screening Value
TACO - (35 Illinois Administrative Code Part 742 (Tiered Approach to Corrective Action Objectives)
Figure 16
Figure 17
Figure 18
Figure 19
Figure 20
SR000735
GEI

Technical Memorandum

4601 DTC Boulevard, Suite 325 ● Denver, Colorado 80237 ● 303.662.0100

To:	Illinois Environmental Protection Agency
From:	J. Michael Hawthorne, P.G. and Camille Carter, GEI Consultants, Inc. Daniel J. Lombardi, P.G. St. John-Mittelhauser & Associates, Inc. A Terracon Company
cc:	Tom Mroz, The Premcor Refining Group Inc.
Date:	April 10, 2025
Re:	Corrective Measures Completion Report for the Soil Vapor Extraction System The Premcor Refining Group Inc. Hartford, Illinois
Project No.:	2500059

This Corrective Measures Completion Report (CMCR) was prepared on behalf of The Premcor Refining Group Inc. (Premcor) for their Facility (Facility) located in Hartford, Illinois and is being submitted to the Illinois Environmental Protection Agency (Illinois EPA). In accordance with the *Strategic, Tactical, and Operational Plan for Site-Wide Investigation / Remediation Work* (Strategic Plan, GEI 2018), this CMCR requests Illinois EPA approval for the transition from operating the Soil Vapor Extraction (SVE) System to Monitored Natural Source Zone Depletion (MNSZD) and Monitored Natural Attenuation (MNA) along the Western Property Boundary Line (WPBL).

Introduction

As outlined in the Strategic Plan, the WPBL is the priority area of the Western Property Boundary (WPB) of the Facility, spanning approximately 50 feet in width and 1,200 feet in length (equivalent to 1.4 acres). The WPBL is situated alongside a railway easement that extends towards the Village of Hartford (Figure 1).

The SVE System was implemented as an Interim Remedial Measure and engineering control to limit the potential of vapor-phase constituents of concern (COCs) from migrating off-site and to enhance light non-aqueous phase liquid (LNAPL) removal along the WPBL. Initially, ten RSVE wells (RSVE-01 through RSVE-10) screened in the North Olive Stratum and Main Silt were installed and have been operating since September 2006. The SVE System was expanded in 2007 to include six additional RSVE wells (RSVE-11 through RSVE-16) in the vicinity of well nest RMW-35 to address the presence of LNAPL and COCs exceeding the Class I Groundwater Quality Standards in this area. Operation of the RSVE wells in the RMW-35 Area was discontinued with Illinois EPA approval in August 2018. The locations of the vapor extraction and effectiveness monitoring wells are shown in Figure 2.

The remaining operational wells have achieved the site-specific decision point metric for soil gas recovery in the WPBL, which indicates that the SVE System may cease operation. Upon receiving Illinois EPA approval of this CMCR, operation of the SVE System will be discontinued and monitoring and remediation in the WPBL will continue in accordance with the Strategic Plan.

Site Specific Decision Points

The goal of the LNAPL remedies at the Facility, as adopted in the Strategic Plan, is to reach diminishing returns decision points for hydrocarbon removal such that more permanent natural degradation processes, such as MNSZD and MNA, become the most effective and efficient remediation alternatives. The decision point metrics for soil gas included in the Strategic Plan are the following:

- When MNSZD and MNA are more effective than SVE (Page 41, Paragraph 1);
- Lack of soil gas migration to off-site from contaminated groundwater for the WPBL (Table 8 of the Strategic Plan); and
- Soil gas recovery (Table 9 of the Strategic Plan).

The Strategic Plan documents that when MNSZD and MNA are more effective than the SVE System, a request to cease operation will be submitted in a CMCR for Illinois EPA review and approval prior to SVE System transition to MNSZD and MNA, with the understanding that Illinois EPA will approve the request if MNSZD and MNA combined exceed the rate of bioventing and/or SVE combined. Relevant excerpts from the Strategic Plan are included in Appendix A for reference.

As discussed in Premcor's meeting with the Illinois EPA on February 20, 2024, achievement of the soil gas recovery decision point can be met either by achieving the metrics included in Table 9 of the Strategic Plan or by demonstrating that MNSZD and MNA combined exceed the recovery rate attained by the SVE System. This comparison will include all ten RSVE wells in the WPB and not be restricted to the seven RSVE wells within the WPBL area.

After transition from SVE to MNSZD and MNA, the decision point metric for soil gas migration to off-site from contaminated groundwater for the WPBL (Table 8 of the Strategic Plan) must still be met and documented to demonstrate this exposure route continues to be incomplete.

Decision Point Evaluation

SVE System Performance

Recovery Rate

The SVE System recovers a variety of mixed, light-end hydrocarbons that volatilize from the LNAPL and/or groundwater to limit the potential of vapor-phase COCs from migrating off-site and to enhance LNAPL removal. The recovery data for the SVE System is reported annually, such as in the 2023 *Annual Progress Report Including Quarterly Status Report Fourth Quarter 2023 Premcor Facility* (2023 Annual Progress Report, SMA 2024). The data reported includes all operational RSVE wells. Gallons per day (gpd) of equivalent gallons of gasoline is a proxy measurement for the total volume of soil vapor recovered via the SVE System[1]. Through the end of 2023, the SVE System has recovered about 137,731 equivalent gallons of gasoline. Approximately 59,720 equivalent gallons of gasoline or 43 percent of the total recovery volume have been removed by the ten RSVE wells in the WPB.

For the purposes of this evaluation, the relative volume recovered by each RSVE well was identified based on flame ionization detector (FID) data (Appendix B) at the wellhead. This data is collected at the

[1] It is a calculated value that converts vapor-phase recovery to a liquid (at a specific molecular weight).

wellhead as part of routine operation and maintenance, and the annual average FID result was calculated for each SVE extraction well (Table 1). The total annual volume associated with the two areas of the System (WPBL and the RMW-35 Area) was estimated as a weighted average of the total volume for the entire SVE System. The rates for these areas were then estimated based on the number of operational days each year. These results are presented in Table 2.

The combined recovery rate for the WPBL RSVE wells was relatively consistent from 2007 through 2019, with an average rate of 11 gpd. The rate decreased to an average of 2 gpd from 2020 through 2023. To be conservative, the average rate from 2007 through 2019 of 11 gpd was selected to represent the optimal performance of the SVE System for comparison to the MNSZD rate.

Area of Influence

The effectiveness of the SVE System in the Uppermost Permeable Unit has been evaluated via effectiveness monitoring events performed from September 2006 through October 2017. These events included measuring vacuum, total hydrocarbon concentrations (FID and Photoionization Detector [PID]), and other fixed gases at monitoring wells and points as reported in previously submitted Quarterly and Annual Progress Reports.

The SVE System was designed to have a radius of influence (ROI) of about 100 feet around each RSVE well (Clayton 2003). The distance from the RSVE wells to the associated monitoring points and wells varies from about 40 to 120 feet. Vacuum and FID concentrations at these locations were measured at those distances from the extraction well locations. These values varied over time but the distances where readings were detected stayed generally consistent through 2014. After 2014, vacuum at the monitoring locations was inconsistent, but the recovery rate from the SVE System did not decline, suggesting consistent performance through 2019 (Appendix C).

The ROI of each RSVE well was based on the distance from each RSVE well to its associated effectiveness monitoring points and wells. The area of influence of the SVE System was estimated as the outer edge of each of the radii in order to prevent double counting where ROIs of individual wells overlapped, as shown in Figure 3. It was also restricted to the portion of the ROI that is within the Facility property boundary.

The area of influence of the SVE System was estimated to be about 7 acres. Therefore, the average rate of recovery from the SVE System from 2007 through 2019 is estimated as 700 gallons per acre per year (gal/acre/yr).

MNSZD Performance

The results of the annual MNSZD events have been reported in *Monitored Natural Source Zone Depletion 2022 Results* (GEI and SMA 2023) and *Monitored Natural Source Zone Depletion 2023 Results* (GEI and SMA 2024). To supplement this data, a one-time monitoring event was conducted to evaluate MNSZD rates along the WPBL and facilitate the evaluation of MNSZD rates in comparison to the SVE System removal rates. MNSZD rates were evaluated to represent each of the seven RSVE wells located within the 50-foot WPBL area. These rates were reported in *Monitored Natural Source Zone Depletion 2023 WPBL Results* (GEI 2024). Each of these reports has been submitted previously in the 2022 or 2023 annual reports. Updates to the biogenic heat calculations based on new research data on thermal conductivities of soils and improved equipment calibrations yielding refined thermal gradients were documented in the

April 9, 2025 virtual meeting with the Illinois EPA and were also documented in the *2022 Annual Progress Report Including Quarterly Status Report Fourth Quarter 2022 Premcor Facility Errata* (GEI and SMA 2025a), *2023 Annual Progress Report Including Quarterly Status Report Fourth Quarter 2023 Premcor Facility Errata* (GEI and SMA 2025b), and *Five-Year Evaluation Report (2019-2023) Errata* (GEI and SMA 2025c). The updated results are summarized in Table 3 and Figure 4.

Based on these results, an annual average MNSZD rate of approximately 2,000 gal/acre/year was estimated within the area of influence of the SVE System.

Conclusion

The MNSZD rate in the WPBL of 2,000 gal/acre/year exceeds the performance of the SVE System (700 gal/acre/year). Therefore, the site-specific decision point metric for soil gas recovery in the WPBL has been achieved, which indicates that the SVE System meets the metrics for transition to MNSZD/MNA specified in the Strategic Plan. Premcor requests the Illinois EPA's approval of this transition as intended within the overall Strategic Plan for the site.

Post Completion Monitoring Plan

After transition from SVE to MNSZD and MNA, monitoring of the WPBL will continue in accordance with the Strategic Plan. The decision point metric for soil gas migration to off-site from contaminated groundwater for the WPBL (Table 8 of the Strategic Plan) must continue to be met and documented to demonstrate this exposure route continues to be incomplete.

Achievement of the decision point metric will be evaluated by demonstrating no migration of contaminated groundwater above Corrective Action Objectives (CAOs) for the indoor inhalation exposure route in the uppermost permeable unit in the WPBL. Since no CAOs have been defined for the Facility for the indoor inhalation exposure route, the 35 Illinois Administrative Code 742 - Tiered Approach to Corrective Action Objectives (TACO) Tier 1 Industrial/Commercial Groundwater Remedial Objectives (I/C GROs, Table I of TACO) will be used for the evaluation unless or until another objective is approved by the Illinois EPA. Compliance with this metric can also be demonstrated by showing no groundwater migration (e.g., inward gradient, dry strata).

Groundwater monitoring will be performed semiannually as defined in the Strategic Plan (Tables 10 and 11 and Appendix A4 of the Strategic Plan). Compliance with Table 8 of the Strategic Plan will be reported in the applicable quarterly and annual reports.

In order to confirm that the metrics identified in the Strategic Plan are sufficient to demonstrate any potential vapor issues in the uppermost permeable unit along the WPBL are controlled, a baseline vapor monitoring event will be conducted along the WPBL within 90 days of shutdown of the SVE System. This event will monitor select wells in the North Olive Stratum via PID, FID and percent methane field measurements following historical procedures utilized for such monitoring as approved previously by the Illinois EPA (Bureau Veritas 2008-11-11). Should any concerns be observed, the contingency plan identified herein will be implemented as appropriate to the concern.

Contingency Plan

Inward gradient control (IGC) in multiple strata along the WPBL will continue to be maintained by the IGC System. A new IGC well (RPW-05) will be installed in Q1 and Q2 to maintain IGC. Pumping Well RPW-03 and Production Well P-6 will be used to provide backup contingency capability for the IGC system in the event that maintenance or other activities require temporary shutdown of RPW-04 and/or RPW-05. The installation and operation of new IGC wells will be documented in routine reports for the Facility.

Groundwater in the North Olive Stratum, where it occurs locally in this uppermost permeable unit, is perched and is not influenced by the IGC System. Along the WPBL, the North Olive Stratum is typically dry to containing very little groundwater. Historical gauging data and groundwater concentrations of COCs for wells screened in the North Olive Stratum and located along the WPBL are included in Appendices D and E, respectively. With one exception (RMW-01B through Q4 2021), LNAPL has not been observed in wells, and no exceedances of the I/C GROs for the indoor inhalation exposure route have been observed in the last 10 years in these wells.

Compliance with Table 8 of the Strategic Plan is anticipated to be demonstrated via IGC (wells in the primary aquifer) and dry strata in the North Olive Stratum. However, if groundwater sufficient for sampling recurs in those North Olive Stratum wells in the WPBL area, and if resulting concentrations exceeding the Tier 1 I/C GROs are observed, Premcor's response actions may include (alone or in combination), but are not limited to,

- demonstrating compliance with an alternate measurement standard in Table 8 of the strategic plan,
- proposal of Tier 2 GROs,
- demonstration via measurement-based modeling that soil vapor above TACO-based thresholds is not of concern along the WPBL,
- evaluation of soil gas flux rates relative to the WPBL,
- evaluation of the application of an alternative control technology for the WPBL such as continued operation of the existing SVE system in an optimized mode that does not require off-gas treatment, or
- temporary operation of an appropriate Presumptive Remedy as defined in the Strategic Plan (e.g., bioventing).

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ATTACHMENTS

Figures
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Appendix A Strategic Plan Excerpts
Appendix B SVE System FID Readings
Appendix C SVE Area of Influence Backup
Appendix D Historic Groundwater Concentrations

Figures

Figure 1 Site Map

Figure 2 SVE System Well Locations

Figure 3 SVE System Well Locations with Interpreted Radius of Influence

Figure 4 2023 MNSZD Results

600 300 0 600 1,200

Scale in Feet

CHECK BY: DJL	
DRAWN BY: KAK	
DATE: 5-31-24	
SCALE: AS SHOWN	
MAP NO.: NA	
PROJ NO.: 15-3095.24-913	

SM&A
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A Terracon COMPANY

SITE MAP

SR000743

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

FIGURE
1

RMW-05
RMP-34
RMP-26
RVMP-09
RMP-33
RMP-25
RMP-24
RMP-27
RMP-23
RSVE-16
RSVE-15
RSVE-14
RMP-28
RMP-36
RMP-22
RMP-32
RMW-35
RMP-21
RSVE-13
RMP-35
RSVE-11
RSVE-12
RMP-29
RMP-31
RMP-20
SVE System Buildings
RMP-30
RMW-47
RMP-16
RVMP-07
RVMP-08
RSVE-01
RMP-05
RMP-06
RSVE-02
RMW-03
RVMP-06
RMW-57
RMP-07
RSVE-04
RMW-48
RMW-24
RMW-64
RMW-26
RMP-17A
RSVE-05
RMW-25
RMP-15
RSVE-03
RMP-08
RMP-09
FIRE POND
RSVE-06
RMP-10
RMW-49
RMW-46
RMP-18A
RMP-11
RSVE-07
RMW-93
RMP-19A
RMW-02
RMW-42
RVMP-05
RMW-94
RSVE-08
RMP-37
RMP-12
RMW-72
RVMP-04
RMW-98
RMW-28
RMW-37
RMW-27
RSVE-09
RMW-29
RMP-13
RMW-01
RMP-14
RVMP-03
RMW-30
RSVE-10
Hawthorne Street

Legend

- SVE Effectiveness Monitoring Locations
- SVE Wells
- SVE Piping
- WPBL Buffer
- Facility Boundary

0 62.5 125 250 375 500

Scale in Feet

CHECK BY: DJL	
DRAWN BY: KAK	
DATE: 5-31-24	
SCALE: AS SHOWN	
MAP NO.: N/A	
PROJ NO.:15-03095.24-913	

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SVE System Well Locations

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

SR000744

FIGURE 2

RSVE-16
RSVE-15
RSVE-14
RSVE-13
RSVE-12
RSVE-11
SVE System Buildings
RMW-47A
RSVE-01
RMP-05B
RMP-06B
RMW-03A
RSVE-02
RMP-07B
RSVE-04
RMW-48A
RMW-24A
RMW-26A
RSVE-05
RSVE-03
RMP-08B
RMP-15B
RMP-09B
FIRE POND
RSVE-06
RMP-10B
RMW-49A
RMW-46A
RMP-11B
RSVE-07
RMW-93A
RMW-02A
RMW-42A
RMW-94A
RSVE-08
RMP-37A
RMP-12B
RMP-12C
RMW-98A
RMW-37A
RMW-27A
RMW-28A
RSVE-09
RMP-13B
RMW-01B
RMP-14B
RSVE-10
RMW-30A
Hawthorne Street

Legend

- SVE Effectiveness Monitoring Locations Uppermost Permeable Horizon
- SVE Wells
- Interpreted Radius of Influence (ROI)
- SVE Piping
- Overall ROI Coverage (6.68 Acres)
- WPBL Buffer
- Facility Boundary

0 62.5 125 250 375 500

Scale in Feet

CHECK BY: DJL	
DRAWN BY: KAK	
DATE: 7-3-24	
SCALE: AS SHOWN	
MAP NO.: N/A	
PROJ NO.:15-03095.24-913	

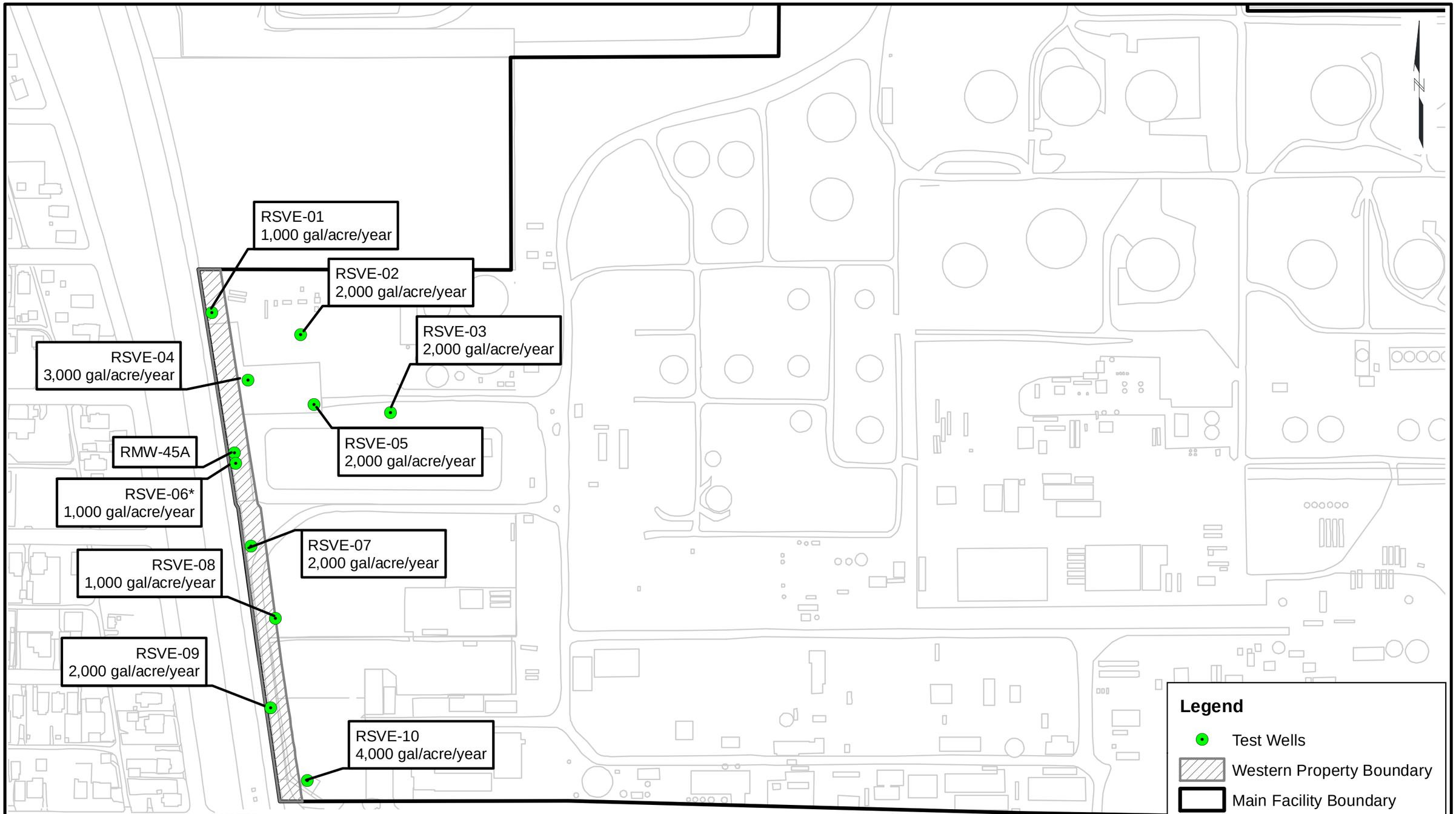
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SVE System Well Locations with Interpreted Radius of Influence

THE PREMCOR REFINING GROUP INC.
HARTFORD, ILLINOIS

FIGURE 3

SR000745



NOTES:

- NSZD = Natural source zone depletion
- NSZD rates are in gallons per acre per year
- MNSZD = Monitored natural source zone depletion
- WPBL = Western Property Boundary Line
- Basemap adapted from SMA provided figures
-* Due to the inaccessibility of RSVE-06, RMW-45A was utilized as a backup.

Corrective Measures
Completion Report for the Soil
Vapor Extraction System

The Premcor Refining Group Inc.
Hartford, Illinois

GEI Consultants

2023 MNSZD Results

Project 2400073 | January 2025 | SR000746 | Figure 4

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Tables

Table 1 Annual Average FID Concentrations

Table 2 Average Annual SVE System Recovery Rates

Table 3 2023 MNSZD Results

Table 1. Annual Average FID Results
Corrective Measures Completion Report for the Soil Vapor Extraction System
Premcor Facility, Hartford, Illinois

Year	WPBL ppmv										RMW-35 Area ppmv					
	RSVE-01	RSVE-02	RSVE-03	RSVE-04	RSVE-05	RSVE-06	RSVE-07	RSVE-08	RSVE-09	RSVE-10	RSVE-11	RSVE-12	RSVE-13	RSVE-14	RSVE-15	RSVE-16
2006	119,093	398,186	767,095	264,727	752,405	111,285	77,242	256,413	1,797	26,602	--	--	--	--	--	--
2007	11,239	8,986	230,193	17,110	129,688	4,310	2,589	49,305	1,250	2,425	13,486	376,791	748,676	30,041	238,824	23,673
2008	4,652	1,479	132,824	8,918	55,368	1,745	637	31,701	719	5,556	29,751	205,339	618,900	8,737	162,540	1,419
2009	4,347	606	156,469	7,565	38,942	1,540	954	22,770	19	2,523	4,349	40,654	323,252	3,008	258,750	1,368
2010	73,774	8,013	170,667	42,602	87,318	2,825	1,603	63,682	472	10,872	4,245	151,322	126,455	62,775	252,418	1,564
2011	100,084	7,139	252,872	27,861	126,931	1,041	2,244	47,905	164	11,918	292	100,842	266,442	19,375	230,358	1,939
2012	47,589	13,954	182,561	19,906	85,707	712	892	9,444	33	6,286	107	61,775	134,913	4,033	270,867	3,704
2013	9,710	3,332	71,463	20,288	42,303	399	412	2,408	692	4,183	137	61,333	74,941	927	159,376	742
2014	6,204	19,232	78,649	14,506	32,201	227	47	1,990	19	4,328	201	73,429	144,477	1,694	113,514	5,082
2015	3,218	1,026	94,952	24,756	45,776	166	163	6,828	74	5,502	325	48,033	102,626	4,345	150,834	2,498
2016	27,658	3,089	110,465	58,015	82,792	725	1,392	11,952	162	6,077	3,662	72,802	20,037	2,686	98,798	2,201
2017	42,371	45,668	184,838	140,603	220,000	534	2,768	21,510	206	6,233	1,350	40,492	10,470	1,608	51,729	854
2018	21,672	77,115	344,692	72,397	213,650	440	4,317	59,099	320	3,683	2,260	27,013	2,439	12,349	179,572	11,783
2019	82,903	95,220	151,479	33,466	202,275	2,855	3,786	25,295	252	4,612	--	--	--	--	--	--
2020	29,719	1,208	357,638	143,045	298,500	1,780	4,988	42,095	233	14,766	--	--	--	--	--	--
2021	44,825	2,474	375,125	83,986	138,538	615	8,189	53,923	131	2,626	--	--	--	--	--	--
2022	37,500	1,970	373,125	63,760	146,625	507	3,780	37,023	266	15,267	--	--	--	--	--	--
2023	172	13,915	187,513	5,502	299,500	212	1,769	39,710	150	384	--	--	--	--	--	--

Notes:
-- not operated
FID = Flame Ionization Detector
MNSZD = Monitored Natural Source Zone Depletion
ppmv = parts per million by volume
SVE = Soil Vapor Extraction
WPBL = Priority Area of the Western Property Boundary (Western Property Boundary Line)

Table 2. Average Annual SVE System Recovery Rates
Corrective Measures Completion Report for the Soil Vapor Extraction System
Premcor Facility, Hartford, Illinois

Year	Total Annual Recovered Volume (gal)	System Operational Days[1]	SVE Recovery Rate (gpd)	
			WPBL	RMW-35 Area
2006	5,431	120	45	--
2007	21,569	365	14	30
2008	13,720	365	7.2	20
2009	8,540	365	6.4	12
2010	2,690	365	3.2	5.1
2011	10,629	365	14	17
2012	13,005	365	16	14
2013	12,268	365	12	12
2014	12,646	365	11	26
2015	10,818	365	11	18
2016	7,961	365	13	8.9
2017	6,432	365	15	3.7
2018	4,822	365	10	4.0
2019	4,139	364	11	--
2020	1,206	365	3.3	--
2021	383	365	1.0	--
2022	501	358	1.4	--
2023	971	364	2.7	--

Notes:
-- not operated
gal = gallons
gpd = gallons per day
MNSZD = Monitored Natural Source Zone Depletion
ppmv = parts per million by volume
SVE = Soil Vapor Extraction
WPBL = Western Property Boundary Line
WPB = Western Property Boundary

1 - System operational days estimated based on the actual dates measurements were recorded and may deviate from the calendar year.

Table 3. 2023 MNSZD Results
Corrective Measures Completion Report for the Soil Vapor Extraction System
Premcor Facility, Hartford, Illinois

Location	MNSZD Rate (gal/acre/year)
RSVE-01	1,000
RSVE-02	2,000[1]
RSVE-03	2,000[1]
RSVE-04	3,000
RSVE-05	2,000[1]
RSVE-06[2]	1,000
RSVE-07	2,000
RSVE-08	1,000
RSVE-09	2,000
RSVE-10	4,000
Total Average	2,000

Notes:
MNSZD = Monitored Natural Source Zone Depletion
gal/acre/year = gallons per acre per year

1 - Rate estimated as the average of all locations tested in 2023 in the North Olive Stratum (RSVE-01, RSVE-04, RSVE-06, RSVE-07, RSVE-08, and RMP-07C) rounded to the nearest thousand.
2 - Due to the inaccessibility of RSVE-06, RMW-45A was utilized as a backup.

Appendix A Strategic Plan Excerpts

Appendix A – Strategic Plan Excerpts

The decision point metrics for soil gas included in the Strategic Plan are the following:

Section 4.2, Page 41, Paragraph 1

The effectiveness of MNA and MNSZD versus bioventing and/or SVE will be reviewed every 5 years and documented in a 5-year evaluation report (Section 4.4.2), and if MNA and MNSZD are more effective than bioventing and/or SVE, a request to cease operation of the bioventing and/or SVE will be submitted in a CMCR for Illinois EPA review and approval prior to shutdown of bioventing and/or SVE, with the understanding that Illinois EPA will approve the request if MNA and MNSZD combined exceed the rate of bioventing and/or SVE combined.

Footnote 1: A preapproval workplan will be submitted for Illinois EPA review and approval prior to full-scale implementation of MNSZD and MNA, monitoring and implementation of bioventing along the WPBL, or controls proposed in CAORs.

Section 4.4.2, Page 69, Paragraph 1

A CMCR will be prepared when major milestones towards corrective action objectives and/or metrics have been achieved. The milestones when a CMCR will be submitted are:

- Shut down of IGC along the WPBL;
- Transition from bioventing and/or SVE to MNA and MNSZD along the WPBL;
- Achievement of hydraulic recovery metrics (Table 6) sitewide;
- Achievement of LNAPL MEP (Table 7) sitewide; and
- Completion of a non-presumptive remedy as specified in a design plan and/or modification report.

Table 8

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
After Shutdown of SVE and/or Bioventing			
Off-site Migration Analysis	No migration of vapor-phase COCs exceeding the soil gas CAOs along the	CAO values	• Annual measurement of soil gas values in uppermost permeable stratum wells under non-operating SVE system conditions to demonstrate absence of values exceeding soil gas CAOs

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
	WPBL when dissolved-phase plume stability metrics are met under natural conditions		
During SVE and/or Bioventing			
Off-site Migration Analysis	No migration of vapor-phase COCs exceeding the soil gas CAOs along the WPBL when dissolved-phase plume stability metrics are met under natural conditions	Maintain vacuum along the WPBL in the uppermost permeable stratum	• Gauge vacuum in sealed wells: Measured vacuum or an occluded screen in select vapor monitoring wells along the WPBL while SVE along WPBL is operational
		Maintain vacuum at SVE Manifold	• Maintain manifold vacuum of at least 5 inches of Hg at least 75% per annum and monitor SVE system manifold vacuum at least once weekly
		Maintain oxygen concentration during bioventing	• Maintain oxygen concentration sufficient to support aerobic biologic activity. Measurement locations and frequency along with a quantitative threshold would be proposed in conjunction with construction and operation of a bioventing system
Either During or After Shutdown of SVE and/or Bioventing			
Off-site Migration Analysis	No migration of contaminated groundwater above CAOs for indoor inhalation	CAO values	• Groundwater Monitoring Results compared to CAOs

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
	exposure route		
	Exposure route exclusion	TACO	• All criteria to exclude the route are met or a documented plan is in place to achieve them

Table 8 Soil gas migration metrics for the WPBL. One measurement standard for the applicable status of soil gas control must be met to demonstrate there is no potentially complete exposure route from the Facility to the Village of Hartford while meeting the metrics specified in Table 3.

Table 9

Decision Point Metric	Threshold	Measurement Standard	Measurement Process
Cumulative Recovered Volume	≥ 90% of Expected Ultimate Recovery Volume	Decline Curve Analysis Poston and Poe 2008 API 2001	• Monitor based on LNAPL recovery data on a rate-cumulative decline curve via methods in Poston & Poe 2008 and API 2001 • Estimate expected ultimate recovery volume via first-order decay model
Respiration Rate	Respiration rate (% oxygen/day) drops below quantitative threshold	Evaluation consistent with: *Soil Vapor Extraction and Bioventing* (USACE 2002)	• Measurement locations and frequency along with a quantitative threshold would be proposed in conjunction with construction and operation of a bioventing system.
Route exclusion	N/A	TACO	• All criteria to exclude the route are met or a documented plan is in place to achieve them

Table 9 Soil gas recovery metrics. Any one of these metrics must be met to demonstrate soil gas has been recovered to the decision point.

Appendix B SVE System FID Readings

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-01	9/1/2006	09-2006	2006-Q3	815,000
RSVE-02	9/1/2006	09-2006	2006-Q3	1,472,500
RSVE-03	9/1/2006	09-2006	2006-Q3	3,187,500
RSVE-04	9/1/2006	09-2006	2006-Q3	1,375,000
RSVE-05	9/1/2006	09-2006	2006-Q3	2,507,500
RSVE-06	9/1/2006	09-2006	2006-Q3	680,000
RSVE-07	9/1/2006	09-2006	2006-Q3	577,500
RSVE-08	9/1/2006	09-2006	2006-Q3	1,925,000
RSVE-09	9/1/2006	09-2006	2006-Q3	5,640
RSVE-10	9/1/2006	09-2006	2006-Q3	100,425
RSVE-01	9/6/2006	09-2006	2006-Q3	257,500
RSVE-02	9/6/2006	09-2006	2006-Q3	1,175,000
RSVE-03	9/6/2006	09-2006	2006-Q3	1,250,000
RSVE-04	9/6/2006	09-2006	2006-Q3	595,000
RSVE-05	9/6/2006	09-2006	2006-Q3	1,250,000
RSVE-06	9/6/2006	09-2006	2006-Q3	306,000
RSVE-07	9/6/2006	09-2006	2006-Q3	194,000
RSVE-08	9/6/2006	09-2006	2006-Q3	495,000
RSVE-09	9/6/2006	09-2006	2006-Q3	1,625
RSVE-10	9/6/2006	09-2006	2006-Q3	36,390
RSVE-01	9/7/2006	09-2006	2006-Q3	382,500
RSVE-02	9/7/2006	09-2006	2006-Q3	1,250,000
RSVE-03	9/7/2006	09-2006	2006-Q3	1,250,000
RSVE-04	9/7/2006	09-2006	2006-Q3	1,125,000
RSVE-05	9/7/2006	09-2006	2006-Q3	1,250,000
RSVE-06	9/7/2006	09-2006	2006-Q3	310,000
RSVE-07	9/7/2006	09-2006	2006-Q3	363,000
RSVE-08	9/7/2006	09-2006	2006-Q3	577,500
RSVE-09	9/7/2006	09-2006	2006-Q3	7,520
RSVE-10	9/7/2006	09-2006	2006-Q3	44,910
RSVE-01	9/8/2006	09-2006	2006-Q3	179,000
RSVE-02	9/8/2006	09-2006	2006-Q3	1,627,500
RSVE-03	9/8/2006	09-2006	2006-Q3	1,250,000
RSVE-04	9/8/2006	09-2006	2006-Q3	402,500
RSVE-05	9/8/2006	09-2006	2006-Q3	1,250,000
RSVE-06	9/8/2006	09-2006	2006-Q3	196,000
RSVE-07	9/8/2006	09-2006	2006-Q3	144,000
RSVE-08	9/8/2006	09-2006	2006-Q3	342,500
RSVE-09	9/8/2006	09-2006	2006-Q3	1,243
RSVE-10	9/8/2006	09-2006	2006-Q3	30,410
RSVE-01	9/11/2006	09-2006	2006-Q3	89,060
RSVE-02	9/11/2006	09-2006	2006-Q3	570,000
RSVE-03	9/11/2006	09-2006	2006-Q3	1,082,500
RSVE-04	9/11/2006	09-2006	2006-Q3	358,000
RSVE-05	9/11/2006	09-2006	2006-Q3	1,250,000
RSVE-06	9/11/2006	09-2006	2006-Q3	118,000
RSVE-07	9/11/2006	09-2006	2006-Q3	105,000
RSVE-08	9/11/2006	09-2006	2006-Q3	301,000
RSVE-09	9/11/2006	09-2006	2006-Q3	625

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-10	9/11/2006	09-2006	2006-Q3	21,550
RSVE-01	9/12/2006	09-2006	2006-Q3	80,870
RSVE-02	9/12/2006	09-2006	2006-Q3	562,500
RSVE-03	9/12/2006	09-2006	2006-Q3	1,352,500
RSVE-04	9/12/2006	09-2006	2006-Q3	327,000
RSVE-05	9/12/2006	09-2006	2006-Q3	1,250,000
RSVE-06	9/12/2006	09-2006	2006-Q3	86,230
RSVE-07	9/12/2006	09-2006	2006-Q3	54,410
RSVE-08	9/12/2006	09-2006	2006-Q3	273,000
RSVE-09	9/12/2006	09-2006	2006-Q3	1,121
RSVE-10	9/12/2006	09-2006	2006-Q3	25,970
RSVE-01	9/15/2006	09-2006	2006-Q3	57,540
RSVE-02	9/15/2006	09-2006	2006-Q3	391,000
RSVE-03	9/15/2006	09-2006	2006-Q3	707,500
RSVE-04	9/15/2006	09-2006	2006-Q3	140,000
RSVE-05	9/15/2006	09-2006	2006-Q3	1,062,500
RSVE-06	9/15/2006	09-2006	2006-Q3	56,100
RSVE-07	9/15/2006	09-2006	2006-Q3	33,840
RSVE-08	9/15/2006	09-2006	2006-Q3	170,000
RSVE-09	9/15/2006	09-2006	2006-Q3	641
RSVE-10	9/15/2006	09-2006	2006-Q3	18,930
RSVE-01	9/19/2006	09-2006	2006-Q3	95,740
RSVE-02	9/19/2006	09-2006	2006-Q3	291,000
RSVE-03	9/19/2006	09-2006	2006-Q3	880,000
RSVE-04	9/19/2006	09-2006	2006-Q3	260,000
RSVE-05	9/19/2006	09-2006	2006-Q3	982,500
RSVE-06	9/19/2006	09-2006	2006-Q3	46,520
RSVE-07	9/19/2006	09-2006	2006-Q3	40,220
RSVE-08	9/19/2006	09-2006	2006-Q3	120,000
RSVE-09	9/19/2006	09-2006	2006-Q3	5,873
RSVE-10	9/19/2006	09-2006	2006-Q3	10,350
RSVE-01	9/27/2006	09-2006	2006-Q3	81,770
RSVE-02	9/27/2006	09-2006	2006-Q3	130,000
RSVE-03	9/27/2006	09-2006	2006-Q3	522,500
RSVE-04	9/27/2006	09-2006	2006-Q3	165,000
RSVE-05	9/27/2006	09-2006	2006-Q3	570,000
RSVE-06	9/27/2006	09-2006	2006-Q3	32,180
RSVE-07	9/27/2006	09-2006	2006-Q3	22,510
RSVE-08	9/27/2006	09-2006	2006-Q3	155,500
RSVE-09	9/27/2006	09-2006	2006-Q3	4,780
RSVE-10	9/27/2006	09-2006	2006-Q3	11,160
RSVE-01	10/3/2006	10-2006	2006-Q4	59,710
RSVE-02	10/3/2006	10-2006	2006-Q4	93,070
RSVE-03	10/3/2006	10-2006	2006-Q4	457,500
RSVE-04	10/3/2006	10-2006	2006-Q4	131,000
RSVE-05	10/3/2006	10-2006	2006-Q4	555,000
RSVE-06	10/3/2006	10-2006	2006-Q4	25,180
RSVE-07	10/3/2006	10-2006	2006-Q4	15,950
RSVE-08	10/3/2006	10-2006	2006-Q4	121,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-09	10/3/2006	10-2006	2006-Q4	1,052
RSVE-10	10/3/2006	10-2006	2006-Q4	9,320
RSVE-01	10/11/2006	10-2006	2006-Q4	67,340
RSVE-02	10/11/2006	10-2006	2006-Q4	72,960
RSVE-03	10/11/2006	10-2006	2006-Q4	347,000
RSVE-04	10/11/2006	10-2006	2006-Q4	136,000
RSVE-05	10/11/2006	10-2006	2006-Q4	421,000
RSVE-06	10/11/2006	10-2006	2006-Q4	308,000
RSVE-07	10/11/2006	10-2006	2006-Q4	16,800
RSVE-08	10/11/2006	10-2006	2006-Q4	120,000
RSVE-09	10/11/2006	10-2006	2006-Q4	1,188
RSVE-10	10/12/2006	10-2006	2006-Q4	10,040
RSVE-01	10/19/2006	10-2006	2006-Q4	88,100
RSVE-02	10/19/2006	10-2006	2006-Q4	123,000
RSVE-03	10/19/2006	10-2006	2006-Q4	382,500
RSVE-04	10/19/2006	10-2006	2006-Q4	121,000
RSVE-05	10/19/2006	10-2006	2006-Q4	385,000
RSVE-06	10/19/2006	10-2006	2006-Q4	43,500
RSVE-07	10/19/2006	10-2006	2006-Q4	13,000
RSVE-08	10/19/2006	10-2006	2006-Q4	133,000
RSVE-09	10/19/2006	10-2006	2006-Q4	1,572
RSVE-10	10/19/2006	10-2006	2006-Q4	3,110
RSVE-01	11/2/2006	11-2006	2006-Q4	31,740
RSVE-02	11/2/2006	11-2006	2006-Q4	77,520
RSVE-03	11/2/2006	11-2006	2006-Q4	345,000
RSVE-04	11/2/2006	11-2006	2006-Q4	52,780
RSVE-05	11/2/2006	11-2006	2006-Q4	453,000
RSVE-06	11/2/2006	11-2006	2006-Q4	22,000
RSVE-07	11/2/2006	11-2006	2006-Q4	5,364
RSVE-08	11/2/2006	11-2006	2006-Q4	36,600
RSVE-09	11/2/2006	11-2006	2006-Q4	432
RSVE-10	11/2/2006	11-2006	2006-Q4	998
RSVE-01	11/9/2006	11-2006	2006-Q4	29,670
RSVE-02	11/9/2006	11-2006	2006-Q4	13,940
RSVE-03	11/9/2006	11-2006	2006-Q4	352,500
RSVE-04	11/9/2006	11-2006	2006-Q4	49,140
RSVE-05	11/9/2006	11-2006	2006-Q4	336,000
RSVE-06	11/9/2006	11-2006	2006-Q4	18,400
RSVE-07	11/9/2006	11-2006	2006-Q4	5,911
RSVE-08	11/9/2006	11-2006	2006-Q4	93,740
RSVE-09	11/9/2006	11-2006	2006-Q4	422
RSVE-10	11/9/2006	11-2006	2006-Q4	3,590
RSVE-01	11/16/2006	11-2006	2006-Q4	37,910
RSVE-02	11/16/2006	11-2006	2006-Q4	103,000
RSVE-03	11/16/2006	11-2006	2006-Q4	430,000
RSVE-04	11/16/2006	11-2006	2006-Q4	68,240
RSVE-05	11/16/2006	11-2006	2006-Q4	458,000
RSVE-06	11/16/2006	11-2006	2006-Q4	19,300
RSVE-07	11/16/2006	11-2006	2006-Q4	5,635

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-08	11/16/2006	11-2006	2006-Q4	150,000
RSVE-09	11/16/2006	11-2006	2006-Q4	201
RSVE-10	11/16/2006	11-2006	2006-Q4	129
RSVE-01	11/20/2006	11-2006	2006-Q4	28,010
RSVE-02	11/20/2006	11-2006	2006-Q4	52,450
RSVE-03	11/20/2006	11-2006	2006-Q4	340,000
RSVE-04	11/20/2006	11-2006	2006-Q4	53,910
RSVE-05	11/20/2006	11-2006	2006-Q4	344,000
RSVE-06	11/20/2006	11-2006	2006-Q4	12,100
RSVE-07	11/20/2006	11-2006	2006-Q4	7,439
RSVE-08	11/20/2006	11-2006	2006-Q4	47,480
RSVE-09	11/21/2006	11-2006	2006-Q4	79
RSVE-10	11/21/2006	11-2006	2006-Q4	2,060
RSVE-01	11/29/2006	11-2006	2006-Q4	32,020
RSVE-02	11/29/2006	11-2006	2006-Q4	54,110
RSVE-03	11/29/2006	11-2006	2006-Q4	492,000
RSVE-04	11/29/2006	11-2006	2006-Q4	66,920
RSVE-05	11/29/2006	11-2006	2006-Q4	251,000
RSVE-06	11/29/2006	11-2006	2006-Q4	15,000
RSVE-07	11/29/2006	11-2006	2006-Q4	4,403
RSVE-08	11/29/2006	11-2006	2006-Q4	80,460
RSVE-09	11/29/2006	11-2006	2006-Q4	22
RSVE-10	11/29/2006	11-2006	2006-Q4	4,910
RSVE-01	12/6/2006	12-2006	2006-Q4	20,120
RSVE-02	12/6/2006	12-2006	2006-Q4	90,080
RSVE-03	12/6/2006	12-2006	2006-Q4	370,000
RSVE-04	12/6/2006	12-2006	2006-Q4	31,740
RSVE-05	12/6/2006	12-2006	2006-Q4	304,000
RSVE-06	12/6/2006	12-2006	2006-Q4	10,200
RSVE-07	12/6/2006	12-2006	2006-Q4	1,659
RSVE-08	12/7/2006	12-2006	2006-Q4	31,930
RSVE-09	12/7/2006	12-2006	2006-Q4	548
RSVE-10	12/7/2006	12-2006	2006-Q4	217,000
RSVE-01	12/13/2006	12-2006	2006-Q4	23,910
RSVE-02	12/13/2006	12-2006	2006-Q4	84,080
RSVE-03	12/13/2006	12-2006	2006-Q4	357,500
RSVE-04	12/13/2006	12-2006	2006-Q4	36,620
RSVE-05	12/13/2006	12-2006	2006-Q4	312,000
RSVE-06	12/13/2006	12-2006	2006-Q4	10,500
RSVE-07	12/13/2006	12-2006	2006-Q4	4,527
RSVE-08	12/13/2006	12-2006	2006-Q4	40,060
RSVE-09	12/13/2006	12-2006	2006-Q4	410
RSVE-10	12/13/2006	12-2006	2006-Q4	592
RSVE-01	12/20/2006	12-2006	2006-Q4	22,120
RSVE-02	12/20/2006	12-2006	2006-Q4	39,520
RSVE-03	12/20/2006	12-2006	2006-Q4	362,500
RSVE-04	12/20/2006	12-2006	2006-Q4	24,550
RSVE-05	12/20/2006	12-2006	2006-Q4	226,000
RSVE-06	12/20/2006	12-2006	2006-Q4	12,100

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-07	12/20/2006	12-2006	2006-Q4	3,351
RSVE-08	12/20/2006	12-2006	2006-Q4	86,700
RSVE-09	12/20/2006	12-2006	2006-Q4	1,875
RSVE-10	12/20/2006	12-2006	2006-Q4	2,920
RSVE-01	12/27/2006	12-2006	2006-Q4	21,330
RSVE-02	12/27/2006	12-2006	2006-Q4	88,670
RSVE-03	12/27/2006	12-2006	2006-Q4	390,000
RSVE-04	12/27/2006	12-2006	2006-Q4	39,860
RSVE-05	12/27/2006	12-2006	2006-Q4	383,000
RSVE-06	12/27/2006	12-2006	2006-Q4	9,680
RSVE-07	12/27/2006	12-2006	2006-Q4	3,570
RSVE-08	12/27/2006	12-2006	2006-Q4	84,200
RSVE-09	12/27/2006	12-2006	2006-Q4	876
RSVE-10	12/27/2006	12-2006	2006-Q4	3,870
RSVE-01	1/3/2007	01-2007	2007-Q1	17,770
RSVE-02	1/3/2007	01-2007	2007-Q1	65,980
RSVE-03	1/3/2007	01-2007	2007-Q1	405,000
RSVE-04	1/3/2007	01-2007	2007-Q1	47,310
RSVE-05	1/3/2007	01-2007	2007-Q1	286,000
RSVE-06	1/3/2007	01-2007	2007-Q1	7,623
RSVE-07	1/3/2007	01-2007	2007-Q1	4,246
RSVE-08	1/3/2007	01-2007	2007-Q1	33,230
RSVE-09	1/3/2007	01-2007	2007-Q1	587
RSVE-10	1/3/2007	01-2007	2007-Q1	693
RSVE-01	1/11/2007	01-2007	2007-Q1	13,410
RSVE-02	1/11/2007	01-2007	2007-Q1	53,970
RSVE-03	1/11/2007	01-2007	2007-Q1	365,000
RSVE-04	1/11/2007	01-2007	2007-Q1	32,280
RSVE-05	1/11/2007	01-2007	2007-Q1	234,000
RSVE-06	1/11/2007	01-2007	2007-Q1	5,321
RSVE-07	1/11/2007	01-2007	2007-Q1	4,028
RSVE-08	1/11/2007	01-2007	2007-Q1	65,810
RSVE-09	1/11/2007	01-2007	2007-Q1	2,258
RSVE-10	1/11/2007	01-2007	2007-Q1	1,860
RSVE-01	1/17/2007	01-2007	2007-Q1	11,660
RSVE-02	1/17/2007	01-2007	2007-Q1	36,070
RSVE-03	1/17/2007	01-2007	2007-Q1	415,000
RSVE-04	1/17/2007	01-2007	2007-Q1	25,630
RSVE-05	1/17/2007	01-2007	2007-Q1	164,000
RSVE-06	1/17/2007	01-2007	2007-Q1	6,100
RSVE-07	1/17/2007	01-2007	2007-Q1	4,566
RSVE-08	1/17/2007	01-2007	2007-Q1	3,380
RSVE-09	1/17/2007	01-2007	2007-Q1	1,030
RSVE-10	1/17/2007	01-2007	2007-Q1	1,284
RSVE-01	1/24/2007	01-2007	2007-Q1	8,590
RSVE-02	1/24/2007	01-2007	2007-Q1	26,150
RSVE-03	1/24/2007	01-2007	2007-Q1	417,500
RSVE-04	1/24/2007	01-2007	2007-Q1	18,700
RSVE-05	1/24/2007	01-2007	2007-Q1	142,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-06	1/24/2007	01-2007	2007-Q1	4,164
RSVE-07	1/24/2007	01-2007	2007-Q1	2,533
RSVE-08	1/24/2007	01-2007	2007-Q1	63,780
RSVE-09	1/24/2007	01-2007	2007-Q1	2,071
RSVE-10	1/24/2007	01-2007	2007-Q1	4,178
RSVE-01	2/1/2007	02-2007	2007-Q1	10,000
RSVE-02	2/1/2007	02-2007	2007-Q1	7,560
RSVE-03	2/1/2007	02-2007	2007-Q1	447,500
RSVE-04	2/1/2007	02-2007	2007-Q1	14,100
RSVE-05	2/1/2007	02-2007	2007-Q1	105,000
RSVE-06	2/1/2007	02-2007	2007-Q1	6,862
RSVE-07	2/1/2007	02-2007	2007-Q1	3,836
RSVE-08	2/1/2007	02-2007	2007-Q1	103,000
RSVE-09	2/1/2007	02-2007	2007-Q1	2,122
RSVE-10	2/1/2007	02-2007	2007-Q1	4,361
RSVE-01	2/7/2007	02-2007	2007-Q1	5,802
RSVE-02	2/7/2007	02-2007	2007-Q1	2,940
RSVE-03	2/7/2007	02-2007	2007-Q1	412,000
RSVE-04	2/7/2007	02-2007	2007-Q1	11,000
RSVE-05	2/7/2007	02-2007	2007-Q1	76,310
RSVE-06	2/7/2007	02-2007	2007-Q1	4,713
RSVE-07	2/7/2007	02-2007	2007-Q1	10,300
RSVE-08	2/7/2007	02-2007	2007-Q1	52,410
RSVE-09	2/7/2007	02-2007	2007-Q1	2,714
RSVE-10	2/7/2007	02-2007	2007-Q1	4,695
RSVE-01	2/14/2007	02-2007	2007-Q1	4,261
RSVE-02	2/14/2007	02-2007	2007-Q1	918
RSVE-03	2/14/2007	02-2007	2007-Q1	134,000
RSVE-04	2/14/2007	02-2007	2007-Q1	9,445
RSVE-05	2/14/2007	02-2007	2007-Q1	124,000
RSVE-06	2/14/2007	02-2007	2007-Q1	32,200
RSVE-07	2/14/2007	02-2007	2007-Q1	12,500
RSVE-08	2/14/2007	02-2007	2007-Q1	40,680
RSVE-09	2/14/2007	02-2007	2007-Q1	2,574
RSVE-10	2/14/2007	02-2007	2007-Q1	3,028
RSVE-01	2/20/2007	02-2007	2007-Q1	2,320
RSVE-02	2/20/2007	02-2007	2007-Q1	1,100
RSVE-03	2/20/2007	02-2007	2007-Q1	362,500
RSVE-04	2/20/2007	02-2007	2007-Q1	9,465
RSVE-06	2/20/2007	02-2007	2007-Q1	3,644
RSVE-07	2/20/2007	02-2007	2007-Q1	2,240
RSVE-08	2/20/2007	02-2007	2007-Q1	44,810
RSVE-09	2/20/2007	02-2007	2007-Q1	1,201
RSVE-10	2/20/2007	02-2007	2007-Q1	827
RSVE-05	2/20/2007	02-2007	2007-Q1	83,080
RSVE-01	2/28/2007	02-2007	2007-Q1	5,903
RSVE-02	2/28/2007	02-2007	2007-Q1	8,830
RSVE-03	2/28/2007	02-2007	2007-Q1	357,500
RSVE-04	2/28/2007	02-2007	2007-Q1	10,750

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-05	2/28/2007	02-2007	2007-Q1	162,000
RSVE-06	2/28/2007	02-2007	2007-Q1	4,678
RSVE-07	2/28/2007	02-2007	2007-Q1	12,900
RSVE-08	2/28/2007	02-2007	2007-Q1	6,580
RSVE-09	2/28/2007	02-2007	2007-Q1	3,624
RSVE-10	2/28/2007	02-2007	2007-Q1	2,684
RSVE-01	3/6/2007	03-2007	2007-Q1	6,905
RSVE-02	3/6/2007	03-2007	2007-Q1	20,630
RSVE-03	3/6/2007	03-2007	2007-Q1	442,000
RSVE-04	3/6/2007	03-2007	2007-Q1	6,940
RSVE-05	3/6/2007	03-2007	2007-Q1	169,000
RSVE-06	3/6/2007	03-2007	2007-Q1	3,612
RSVE-07	3/6/2007	03-2007	2007-Q1	2,026
RSVE-08	3/6/2007	03-2007	2007-Q1	11,370
RSVE-09	3/6/2007	03-2007	2007-Q1	798
RSVE-10	3/6/2007	03-2007	2007-Q1	2,123
RSVE-01	3/13/2007	03-2007	2007-Q1	8,646
RSVE-02	3/13/2007	03-2007	2007-Q1	9,580
RSVE-03	3/13/2007	03-2007	2007-Q1	337,500
RSVE-04	3/13/2007	03-2007	2007-Q1	15,490
RSVE-05	3/13/2007	03-2007	2007-Q1	182,000
RSVE-06	3/13/2007	03-2007	2007-Q1	5,163
RSVE-07	3/13/2007	03-2007	2007-Q1	4,633
RSVE-08	3/13/2007	03-2007	2007-Q1	38,150
RSVE-09	3/13/2007	03-2007	2007-Q1	1,866
RSVE-10	3/13/2007	03-2007	2007-Q1	3,422
RSVE-01	3/23/2007	03-2007	2007-Q1	20,700
RSVE-02	3/23/2007	03-2007	2007-Q1	17,870
RSVE-03	3/23/2007	03-2007	2007-Q1	385,000
RSVE-04	3/23/2007	03-2007	2007-Q1	20,810
RSVE-05	3/23/2007	03-2007	2007-Q1	184,000
RSVE-06	3/23/2007	03-2007	2007-Q1	12,700
RSVE-07	3/23/2007	03-2007	2007-Q1	2,985
RSVE-08	3/23/2007	03-2007	2007-Q1	37,810
RSVE-09	3/23/2007	03-2007	2007-Q1	685
RSVE-10	3/23/2007	03-2007	2007-Q1	833
RSVE-01	3/27/2007	03-2007	2007-Q1	17,400
RSVE-02	3/27/2007	03-2007	2007-Q1	21,670
RSVE-03	3/27/2007	03-2007	2007-Q1	450,000
RSVE-04	3/27/2007	03-2007	2007-Q1	26,030
RSVE-05	3/27/2007	03-2007	2007-Q1	224,000
RSVE-06	3/27/2007	03-2007	2007-Q1	11,600
RSVE-07	3/27/2007	03-2007	2007-Q1	3,559
RSVE-08	3/27/2007	03-2007	2007-Q1	35,670
RSVE-09	3/27/2007	03-2007	2007-Q1	1,092
RSVE-10	3/27/2007	03-2007	2007-Q1	365
RSVE-01	4/3/2007	04-2007	2007-Q2	15,740
RSVE-02	4/3/2007	04-2007	2007-Q2	28,350
RSVE-03	4/3/2007	04-2007	2007-Q2	475,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-04	4/3/2007	04-2007	2007-Q2	23,480
RSVE-05	4/3/2007	04-2007	2007-Q2	235,000
RSVE-06	4/3/2007	04-2007	2007-Q2	8,369
RSVE-07	4/3/2007	04-2007	2007-Q2	6,473
RSVE-08	4/3/2007	04-2007	2007-Q2	88,180
RSVE-09	4/3/2007	04-2007	2007-Q2	3,875
RSVE-10	4/3/2007	04-2007	2007-Q2	695
RSVE-01	4/11/2007	04-2007	2007-Q2	13,450
RSVE-02	4/11/2007	04-2007	2007-Q2	26,730
RSVE-03	4/11/2007	04-2007	2007-Q2	480,000
RSVE-04	4/11/2007	04-2007	2007-Q2	51,690
RSVE-05	4/11/2007	04-2007	2007-Q2	242,000
RSVE-06	4/11/2007	04-2007	2007-Q2	6,184
RSVE-07	4/11/2007	04-2007	2007-Q2	13,100
RSVE-08	4/11/2007	04-2007	2007-Q2	357,500
RSVE-09	4/11/2007	04-2007	2007-Q2	8,257
RSVE-10	4/11/2007	04-2007	2007-Q2	804
RSVE-01	4/20/2007	04-2007	2007-Q2	301,000
RSVE-02	4/20/2007	04-2007	2007-Q2	23,640
RSVE-03	4/20/2007	04-2007	2007-Q2	337,500
RSVE-04	4/20/2007	04-2007	2007-Q2	31,920
RSVE-05	4/20/2007	04-2007	2007-Q2	271,000
RSVE-06	4/20/2007	04-2007	2007-Q2	3,212
RSVE-07	4/20/2007	04-2007	2007-Q2	3,301
RSVE-08	4/20/2007	04-2007	2007-Q2	109,000
RSVE-09	4/20/2007	04-2007	2007-Q2	2,482
RSVE-10	4/20/2007	04-2007	2007-Q2	2,860
RSVE-01	4/25/2007	04-2007	2007-Q2	18,150
RSVE-02	4/25/2007	04-2007	2007-Q2	18,220
RSVE-03	4/25/2007	04-2007	2007-Q2	487,500
RSVE-04	4/25/2007	04-2007	2007-Q2	43,040
RSVE-05	4/25/2007	04-2007	2007-Q2	433,000
RSVE-06	4/25/2007	04-2007	2007-Q2	4,365
RSVE-07	4/25/2007	04-2007	2007-Q2	5,323
RSVE-08	4/25/2007	04-2007	2007-Q2	74,950
RSVE-09	4/25/2007	04-2007	2007-Q2	6,306
RSVE-10	4/25/2007	04-2007	2007-Q2	1,022
RSVE-01	5/2/2007	05-2007	2007-Q2	15,840
RSVE-02	5/2/2007	05-2007	2007-Q2	13,940
RSVE-03	5/2/2007	05-2007	2007-Q2	448,000
RSVE-04	5/2/2007	05-2007	2007-Q2	25,180
RSVE-05	5/2/2007	05-2007	2007-Q2	376,000
RSVE-06	5/2/2007	05-2007	2007-Q2	3,766
RSVE-07	5/2/2007	05-2007	2007-Q2	2,216
RSVE-08	5/2/2007	05-2007	2007-Q2	76,490
RSVE-09	5/2/2007	05-2007	2007-Q2	1,754
RSVE-10	5/2/2007	05-2007	2007-Q2	993
RSVE-01	5/9/2007	05-2007	2007-Q2	9,250
RSVE-02	5/9/2007	05-2007	2007-Q2	13,630

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-03	5/9/2007	05-2007	2007-Q2	392,500
RSVE-04	5/9/2007	05-2007	2007-Q2	16,670
RSVE-05	5/9/2007	05-2007	2007-Q2	393,000
RSVE-06	5/9/2007	05-2007	2007-Q2	3,169
RSVE-07	5/9/2007	05-2007	2007-Q2	2,896
RSVE-08	5/9/2007	05-2007	2007-Q2	51,350
RSVE-09	5/9/2007	05-2007	2007-Q2	3,392
RSVE-10	5/9/2007	05-2007	2007-Q2	876
RSVE-01	5/14/2007	05-2007	2007-Q2	7,985
RSVE-02	5/14/2007	05-2007	2007-Q2	6,190
RSVE-03	5/14/2007	05-2007	2007-Q2	491,000
RSVE-04	5/14/2007	05-2007	2007-Q2	18,400
RSVE-05	5/14/2007	05-2007	2007-Q2	220,000
RSVE-06	5/14/2007	05-2007	2007-Q2	2,745
RSVE-07	5/14/2007	05-2007	2007-Q2	1,334
RSVE-08	5/15/2007	05-2007	2007-Q2	67,600
RSVE-09	5/14/2007	05-2007	2007-Q2	1,804
RSVE-10	5/14/2007	05-2007	2007-Q2	900
RSVE-01	5/22/2007	05-2007	2007-Q2	3,674
RSVE-02	5/22/2007	05-2007	2007-Q2	2,620
RSVE-03	5/22/2007	05-2007	2007-Q2	330,000
RSVE-04	5/22/2007	05-2007	2007-Q2	10,800
RSVE-05	5/22/2007	05-2007	2007-Q2	94,870
RSVE-06	5/22/2007	05-2007	2007-Q2	2,046
RSVE-07	5/22/2007	05-2007	2007-Q2	492
RSVE-08	5/22/2007	05-2007	2007-Q2	62,690
RSVE-09	5/22/2007	05-2007	2007-Q2	1,055
RSVE-10	5/22/2007	05-2007	2007-Q2	2,903
RSVE-01	6/1/2007	06-2007	2007-Q2	1,620
RSVE-02	6/1/2007	06-2007	2007-Q2	2,300
RSVE-03	6/1/2007	06-2007	2007-Q2	336,000
RSVE-04	6/1/2007	06-2007	2007-Q2	10,430
RSVE-05	6/1/2007	06-2007	2007-Q2	83,100
RSVE-06	6/1/2007	06-2007	2007-Q2	2,544
RSVE-07	6/1/2007	06-2007	2007-Q2	1,390
RSVE-08	6/1/2007	06-2007	2007-Q2	54,370
RSVE-09	6/1/2007	06-2007	2007-Q2	1,770
RSVE-10	6/1/2007	06-2007	2007-Q2	159
RSVE-01	6/6/2007	06-2007	2007-Q2	1,940
RSVE-02	6/6/2007	06-2007	2007-Q2	2,300
RSVE-03	6/6/2007	06-2007	2007-Q2	203,000
RSVE-04	6/6/2007	06-2007	2007-Q2	10,260
RSVE-05	6/6/2007	06-2007	2007-Q2	83,560
RSVE-06	6/6/2007	06-2007	2007-Q2	2,891
RSVE-07	6/6/2007	06-2007	2007-Q2	948
RSVE-08	6/6/2007	06-2007	2007-Q2	45,780
RSVE-09	6/6/2007	06-2007	2007-Q2	1,634
RSVE-10	6/6/2007	06-2007	2007-Q2	341
RSVE-01	6/15/2007	06-2007	2007-Q2	2,400

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

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WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-02	6/15/2007	06-2007	2007-Q2	1,850
RSVE-03	6/15/2007	06-2007	2007-Q2	204,000
RSVE-04	6/15/2007	06-2007	2007-Q2	11,000
RSVE-05	6/15/2007	06-2007	2007-Q2	77,520
RSVE-06	6/15/2007	06-2007	2007-Q2	2,398
RSVE-07	6/15/2007	06-2007	2007-Q2	748
RSVE-08	6/15/2007	06-2007	2007-Q2	56,540
RSVE-09	6/15/2007	06-2007	2007-Q2	870
RSVE-10	6/15/2007	06-2007	2007-Q2	3,657
RSVE-01	6/19/2007	06-2007	2007-Q2	1,780
RSVE-02	6/19/2007	06-2007	2007-Q2	2,150
RSVE-03	6/19/2007	06-2007	2007-Q2	248,000
RSVE-04	6/19/2007	06-2007	2007-Q2	12,770
RSVE-05	6/19/2007	06-2007	2007-Q2	83,040
RSVE-06	6/19/2007	06-2007	2007-Q2	2,817
RSVE-07	6/19/2007	06-2007	2007-Q2	1,204
RSVE-08	6/19/2007	06-2007	2007-Q2	59,820
RSVE-09	6/19/2007	06-2007	2007-Q2	661
RSVE-10	6/19/2007	06-2007	2007-Q2	3,475
RSVE-01	6/29/2007	06-2007	2007-Q2	1,528
RSVE-02	6/29/2007	06-2007	2007-Q2	2,090
RSVE-03	6/29/2007	06-2007	2007-Q2	231,000
RSVE-04	6/29/2007	06-2007	2007-Q2	13,800
RSVE-05	6/29/2007	06-2007	2007-Q2	94,830
RSVE-06	6/29/2007	06-2007	2007-Q2	4,210
RSVE-07	6/29/2007	06-2007	2007-Q2	1,338
RSVE-08	6/29/2007	06-2007	2007-Q2	41,400
RSVE-09	6/29/2007	06-2007	2007-Q2	448
RSVE-10	6/29/2007	06-2007	2007-Q2	350
RSVE-01	7/5/2007	07-2007	2007-Q3	1,290
RSVE-02	7/5/2007	07-2007	2007-Q3	1,770
RSVE-03	7/5/2007	07-2007	2007-Q3	166,000
RSVE-04	7/5/2007	07-2007	2007-Q3	11,010
RSVE-05	7/5/2007	07-2007	2007-Q3	88,070
RSVE-06	7/5/2007	07-2007	2007-Q3	4,554
RSVE-07	7/5/2007	07-2007	2007-Q3	1,454
RSVE-08	7/5/2007	07-2007	2007-Q3	45,590
RSVE-09	7/5/2007	07-2007	2007-Q3	883
RSVE-10	7/5/2007	07-2007	2007-Q3	3,597
RSVE-01	7/12/2007	07-2007	2007-Q3	902
RSVE-02	7/12/2007	07-2007	2007-Q3	1,150
RSVE-03	7/12/2007	07-2007	2007-Q3	120,000
RSVE-04	7/12/2007	07-2007	2007-Q3	12,410
RSVE-05	7/12/2007	07-2007	2007-Q3	69,330
RSVE-06	7/12/2007	07-2007	2007-Q3	4,315
RSVE-07	7/12/2007	07-2007	2007-Q3	1,550
RSVE-08	7/12/2007	07-2007	2007-Q3	37,800
RSVE-09	7/12/2007	07-2007	2007-Q3	643
RSVE-10	7/12/2007	07-2007	2007-Q3	452

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WPBL SVE System FID Readings (2006 - 2023)

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WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-01	7/17/2007	07-2007	2007-Q3	1,010
RSVE-02	7/17/2007	07-2007	2007-Q3	1,090
RSVE-03	7/17/2007	07-2007	2007-Q3	168,000
RSVE-04	7/17/2007	07-2007	2007-Q3	13,320
RSVE-05	7/17/2007	07-2007	2007-Q3	63,490
RSVE-06	7/17/2007	07-2007	2007-Q3	3,953
RSVE-07	7/17/2007	07-2007	2007-Q3	1,963
RSVE-08	7/17/2007	07-2007	2007-Q3	43,930
RSVE-09	7/17/2007	07-2007	2007-Q3	801
RSVE-10	7/17/2007	07-2007	2007-Q3	3,317
RSVE-01	7/27/2007	07-2007	2007-Q3	1,490
RSVE-02	7/27/2007	07-2007	2007-Q3	1,160
RSVE-03	7/27/2007	07-2007	2007-Q3	97,710
RSVE-04	7/27/2007	07-2007	2007-Q3	12,370
RSVE-05	7/27/2007	07-2007	2007-Q3	59,040
RSVE-06	7/27/2007	07-2007	2007-Q3	2,674
RSVE-07	7/27/2007	07-2007	2007-Q3	2,099
RSVE-08	7/27/2007	07-2007	2007-Q3	54,090
RSVE-09	7/27/2007	07-2007	2007-Q3	951
RSVE-10	7/27/2007	07-2007	2007-Q3	3,842
RSVE-01	8/2/2007	08-2007	2007-Q3	1,360
RSVE-03	8/2/2007	08-2007	2007-Q3	126,000
RSVE-02	8/2/2007	08-2007	2007-Q3	1,730
RSVE-04	8/2/2007	08-2007	2007-Q3	13,500
RSVE-06	8/2/2007	08-2007	2007-Q3	2,132
RSVE-05	8/2/2007	08-2007	2007-Q3	72,970
RSVE-07	8/2/2007	08-2007	2007-Q3	2,146
RSVE-08	8/2/2007	08-2007	2007-Q3	55,640
RSVE-09	8/2/2007	08-2007	2007-Q3	394
RSVE-10	8/2/2007	08-2007	2007-Q3	4,256
RSVE-01	8/9/2007	08-2007	2007-Q3	1,200
RSVE-02	8/9/2007	08-2007	2007-Q3	1,390
RSVE-03	8/9/2007	08-2007	2007-Q3	101,000
RSVE-04	8/9/2007	08-2007	2007-Q3	16,340
RSVE-05	8/9/2007	08-2007	2007-Q3	49,800
RSVE-06	8/9/2007	08-2007	2007-Q3	2,008
RSVE-07	8/9/2007	08-2007	2007-Q3	711
RSVE-08	8/9/2007	08-2007	2007-Q3	60,910
RSVE-09	8/9/2007	08-2007	2007-Q3	124
RSVE-10	8/9/2007	08-2007	2007-Q3	5,078
RSVE-01	8/16/2007	08-2007	2007-Q3	703
RSVE-02	8/16/2007	08-2007	2007-Q3	1,400
RSVE-03	8/16/2007	08-2007	2007-Q3	94,310
RSVE-04	8/16/2007	08-2007	2007-Q3	17,480
RSVE-05	8/16/2007	08-2007	2007-Q3	55,870
RSVE-06	8/16/2007	08-2007	2007-Q3	1,582
RSVE-07	8/16/2007	08-2007	2007-Q3	834
RSVE-08	8/16/2007	08-2007	2007-Q3	52,100
RSVE-09	8/16/2007	08-2007	2007-Q3	99

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WPBL SVE System FID Readings (2006 - 2023)

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WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-10	8/16/2007	08-2007	2007-Q3	4,284
RSVE-01	8/21/2007	08-2007	2007-Q3	627
RSVE-02	8/21/2007	08-2007	2007-Q3	1,200
RSVE-03	8/21/2007	08-2007	2007-Q3	82,310
RSVE-04	8/21/2007	08-2007	2007-Q3	15,840
RSVE-05	8/21/2007	08-2007	2007-Q3	63,080
RSVE-06	8/21/2007	08-2007	2007-Q3	1,342
RSVE-07	8/21/2007	08-2007	2007-Q3	641
RSVE-08	8/21/2007	08-2007	2007-Q3	48,640
RSVE-09	8/21/2007	08-2007	2007-Q3	57
RSVE-10	8/21/2007	08-2007	2007-Q3	4,351
RSVE-01	8/29/2007	08-2007	2007-Q3	619
RSVE-02	8/29/2007	08-2007	2007-Q3	1,300
RSVE-03	8/29/2007	08-2007	2007-Q3	83,500
RSVE-04	8/29/2007	08-2007	2007-Q3	17,540
RSVE-05	8/29/2007	08-2007	2007-Q3	69,450
RSVE-06	8/29/2007	08-2007	2007-Q3	1,912
RSVE-07	8/29/2007	08-2007	2007-Q3	661
RSVE-08	8/29/2007	08-2007	2007-Q3	4,415
RSVE-09	8/29/2007	08-2007	2007-Q3	60
RSVE-10	8/29/2007	08-2007	2007-Q3	4,428
RSVE-01	9/5/2007	09-2007	2007-Q3	697
RSVE-02	9/5/2007	09-2007	2007-Q3	1,360
RSVE-03	9/5/2007	09-2007	2007-Q3	68,110
RSVE-04	9/5/2007	09-2007	2007-Q3	18,760
RSVE-05	9/5/2007	09-2007	2007-Q3	70,300
RSVE-06	9/5/2007	09-2007	2007-Q3	1,810
RSVE-07	9/5/2007	09-2007	2007-Q3	639
RSVE-08	9/5/2007	09-2007	2007-Q3	43,110
RSVE-09	9/5/2007	09-2007	2007-Q3	81
RSVE-10	9/5/2007	09-2007	2007-Q3	3,604
RSVE-01	9/11/2007	09-2007	2007-Q3	507
RSVE-02	9/11/2007	09-2007	2007-Q3	1,350
RSVE-03	9/11/2007	09-2007	2007-Q3	83,040
RSVE-04	9/11/2007	09-2007	2007-Q3	13,030
RSVE-05	9/11/2007	09-2007	2007-Q3	83,520
RSVE-06	9/11/2007	09-2007	2007-Q3	2,102
RSVE-07	9/11/2007	09-2007	2007-Q3	623
RSVE-08	9/11/2007	09-2007	2007-Q3	34,590
RSVE-09	9/11/2007	09-2007	2007-Q3	67
RSVE-10	9/11/2007	09-2007	2007-Q3	3,766
RSVE-01	9/18/2007	09-2007	2007-Q3	225
RSVE-02	9/18/2007	09-2007	2007-Q3	1,220
RSVE-03	9/18/2007	09-2007	2007-Q3	68,190
RSVE-04	9/18/2007	09-2007	2007-Q3	11,030
RSVE-05	9/18/2007	09-2007	2007-Q3	62,840
RSVE-06	9/18/2007	09-2007	2007-Q3	2,353
RSVE-07	9/18/2007	09-2007	2007-Q3	606
RSVE-08	9/18/2007	09-2007	2007-Q3	32,070

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WPBL SVE System FID Readings (2006 - 2023)

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WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-09	9/18/2007	09-2007	2007-Q3	89
RSVE-10	9/18/2007	09-2007	2007-Q3	4,289
RSVE-01	9/24/2007	09-2007	2007-Q3	1,370
RSVE-02	9/24/2007	09-2007	2007-Q3	1,750
RSVE-03	9/24/2007	09-2007	2007-Q3	63,190
RSVE-04	9/24/2007	09-2007	2007-Q3	15,640
RSVE-05	9/24/2007	09-2007	2007-Q3	69,040
RSVE-06	9/24/2007	09-2007	2007-Q3	2,190
RSVE-07	9/24/2007	09-2007	2007-Q3	635
RSVE-08	9/24/2007	09-2007	2007-Q3	28,080
RSVE-09	9/24/2007	09-2007	2007-Q3	45
RSVE-10	9/24/2007	09-2007	2007-Q3	4,795
RSVE-01	10/2/2007	10-2007	2007-Q4	2,200
RSVE-02	10/2/2007	10-2007	2007-Q4	2,180
RSVE-03	10/2/2007	10-2007	2007-Q4	34,510
RSVE-04	10/2/2007	10-2007	2007-Q4	19,030
RSVE-05	10/2/2007	10-2007	2007-Q4	75,130
RSVE-06	10/2/2007	10-2007	2007-Q4	2,509
RSVE-07	10/2/2007	10-2007	2007-Q4	738
RSVE-08	10/2/2007	10-2007	2007-Q4	28,410
RSVE-09	10/2/2007	10-2007	2007-Q4	44
RSVE-10	10/2/2007	10-2007	2007-Q4	1,804
RSVE-01	10/9/2007	10-2007	2007-Q4	1,900
RSVE-02	10/9/2007	10-2007	2007-Q4	2,100
RSVE-03	10/9/2007	10-2007	2007-Q4	61,260
RSVE-04	10/9/2007	10-2007	2007-Q4	16,610
RSVE-05	10/9/2007	10-2007	2007-Q4	78,410
RSVE-06	10/9/2007	10-2007	2007-Q4	2,564
RSVE-07	10/9/2007	10-2007	2007-Q4	527
RSVE-08	10/9/2007	10-2007	2007-Q4	20,450
RSVE-09	10/9/2007	10-2007	2007-Q4	53
RSVE-10	10/9/2007	10-2007	2007-Q4	3,015
RSVE-01	10/16/2007	10-2007	2007-Q4	2,270
RSVE-02	10/16/2007	10-2007	2007-Q4	1,680
RSVE-03	10/16/2007	10-2007	2007-Q4	54,360
RSVE-04	10/16/2007	10-2007	2007-Q4	13,480
RSVE-05	10/16/2007	10-2007	2007-Q4	73,500
RSVE-06	10/16/2007	10-2007	2007-Q4	2,637
RSVE-07	10/16/2007	10-2007	2007-Q4	554
RSVE-08	10/16/2007	10-2007	2007-Q4	30,430
RSVE-09	10/16/2007	10-2007	2007-Q4	41
RSVE-10	10/16/2007	10-2007	2007-Q4	1,984
RSVE-01	10/23/2007	10-2007	2007-Q4	2,460
RSVE-02	10/23/2007	10-2007	2007-Q4	1,500
RSVE-03	10/23/2007	10-2007	2007-Q4	69,720
RSVE-04	10/23/2007	10-2007	2007-Q4	14,500
RSVE-05	10/23/2007	10-2007	2007-Q4	70,720
RSVE-06	10/23/2007	10-2007	2007-Q4	2,458
RSVE-07	10/23/2007	10-2007	2007-Q4	441

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WPBL SVE System FID Readings (2006 - 2023)

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WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-08	10/23/2007	10-2007	2007-Q4	22,550
RSVE-09	10/23/2007	10-2007	2007-Q4	30
RSVE-10	10/23/2007	10-2007	2007-Q4	2,275
RSVE-01	10/30/2007	10-2007	2007-Q4	3,240
RSVE-02	10/30/2007	10-2007	2007-Q4	1,650
RSVE-03	10/30/2007	10-2007	2007-Q4	78,610
RSVE-04	10/30/2007	10-2007	2007-Q4	19,900
RSVE-05	10/30/2007	10-2007	2007-Q4	93,460
RSVE-06	10/30/2007	10-2007	2007-Q4	2,465
RSVE-07	10/30/2007	10-2007	2007-Q4	371
RSVE-08	10/30/2007	10-2007	2007-Q4	26,180
RSVE-09	10/30/2007	10-2007	2007-Q4	25
RSVE-10	10/30/2007	10-2007	2007-Q4	1,835
RSVE-01	11/6/2007	11-2007	2007-Q4	3,580
RSVE-02	11/6/2007	11-2007	2007-Q4	1,710
RSVE-03	11/6/2007	11-2007	2007-Q4	62,420
RSVE-04	11/6/2007	11-2007	2007-Q4	14,900
RSVE-05	11/6/2007	11-2007	2007-Q4	75,630
RSVE-06	11/6/2007	11-2007	2007-Q4	3,325
RSVE-07	11/6/2007	11-2007	2007-Q4	472
RSVE-08	11/6/2007	11-2007	2007-Q4	21,340
RSVE-09	11/6/2007	11-2007	2007-Q4	428
RSVE-10	11/6/2007	11-2007	2007-Q4	2,608
RSVE-01	11/13/2007	11-2007	2007-Q4	4,838
RSVE-02	11/13/2007	11-2007	2007-Q4	2,490
RSVE-03	11/13/2007	11-2007	2007-Q4	77,800
RSVE-04	11/13/2007	11-2007	2007-Q4	20,900
RSVE-05	11/13/2007	11-2007	2007-Q4	100,000
RSVE-06	11/13/2007	11-2007	2007-Q4	2,740
RSVE-07	11/13/2007	11-2007	2007-Q4	682
RSVE-08	11/13/2007	11-2007	2007-Q4	32,420
RSVE-09	11/13/2007	11-2007	2007-Q4	13
RSVE-10	11/13/2007	11-2007	2007-Q4	3,741
RSVE-01	11/19/2007	11-2007	2007-Q4	3,840
RSVE-02	11/19/2007	11-2007	2007-Q4	1,780
RSVE-03	11/19/2007	11-2007	2007-Q4	61,150
RSVE-04	11/19/2007	11-2007	2007-Q4	9,011
RSVE-05	11/19/2007	11-2007	2007-Q4	73,630
RSVE-06	11/19/2007	11-2007	2007-Q4	2,112
RSVE-07	11/19/2007	11-2007	2007-Q4	490
RSVE-08	11/19/2007	11-2007	2007-Q4	12,260
RSVE-09	11/19/2007	11-2007	2007-Q4	32
RSVE-10	11/19/2007	11-2007	2007-Q4	2,855
RSVE-01	11/27/2007	11-2007	2007-Q4	3,360
RSVE-02	11/27/2007	11-2007	2007-Q4	2,120
RSVE-03	11/27/2007	11-2007	2007-Q4	63,890
RSVE-04	11/27/2007	11-2007	2007-Q4	6,458
RSVE-05	11/27/2007	11-2007	2007-Q4	68,130
RSVE-06	11/27/2007	11-2007	2007-Q4	2,140

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-07	11/27/2007	11-2007	2007-Q4	401
RSVE-08	11/27/2007	11-2007	2007-Q4	27,150
RSVE-09	11/27/2007	11-2007	2007-Q4	60
RSVE-10	11/27/2007	11-2007	2007-Q4	1,572
RSVE-01	12/4/2007	12-2007	2007-Q4	3,725
RSVE-02	12/4/2007	12-2007	2007-Q4	1,950
RSVE-03	12/4/2007	12-2007	2007-Q4	86,930
RSVE-04	12/4/2007	12-2007	2007-Q4	7,918
RSVE-05	12/4/2007	12-2007	2007-Q4	79,850
RSVE-06	12/4/2007	12-2007	2007-Q4	2,644
RSVE-07	12/4/2007	12-2007	2007-Q4	1,042
RSVE-08	12/4/2007	12-2007	2007-Q4	32,650
RSVE-09	12/4/2007	12-2007	2007-Q4	1,761
RSVE-10	12/4/2007	12-2007	2007-Q4	2,108
RSVE-01	12/11/2007	12-2007	2007-Q4	1,584
RSVE-02	12/11/2007	12-2007	2007-Q4	1,960
RSVE-03	12/11/2007	12-2007	2007-Q4	86,430
RSVE-04	12/11/2007	12-2007	2007-Q4	6,714
RSVE-05	12/11/2007	12-2007	2007-Q4	72,330
RSVE-06	12/11/2007	12-2007	2007-Q4	2,169
RSVE-07	12/11/2007	12-2007	2007-Q4	383
RSVE-08	12/11/2007	12-2007	2007-Q4	25,440
RSVE-09	12/11/2007	12-2007	2007-Q4	8
RSVE-10	12/11/2007	12-2007	2007-Q4	302
RSVE-01	12/19/2007	12-2007	2007-Q4	474
RSVE-02	12/19/2007	12-2007	2007-Q4	2,000
RSVE-03	12/19/2007	12-2007	2007-Q4	87,420
RSVE-04	12/19/2007	12-2007	2007-Q4	7,519
RSVE-05	12/19/2007	12-2007	2007-Q4	54,200
RSVE-06	12/19/2007	12-2007	2007-Q4	2,002
RSVE-07	12/19/2007	12-2007	2007-Q4	263
RSVE-08	12/19/2007	12-2007	2007-Q4	11,960
RSVE-09	12/19/2007	12-2007	2007-Q4	9
RSVE-10	12/19/2007	12-2007	2007-Q4	128
RSVE-01	1/4/2008	01-2008	2008-Q1	508
RSVE-02	1/4/2008	01-2008	2008-Q1	1,960
RSVE-03	1/4/2008	01-2008	2008-Q1	179,000
RSVE-04	1/4/2008	01-2008	2008-Q1	3,351
RSVE-05	1/4/2008	01-2008	2008-Q1	49,650
RSVE-06	1/4/2008	01-2008	2008-Q1	1,735
RSVE-07	1/4/2008	01-2008	2008-Q1	176
RSVE-08	1/4/2008	01-2008	2008-Q1	6,910
RSVE-09	1/4/2008	01-2008	2008-Q1	5
RSVE-10	1/4/2008	01-2008	2008-Q1	2,384
RSVE-01	1/15/2008	01-2008	2008-Q1	357
RSVE-02	1/15/2008	01-2008	2008-Q1	149
RSVE-03	1/15/2008	01-2008	2008-Q1	103,000
RSVE-04	1/15/2008	01-2008	2008-Q1	3,417
RSVE-05	1/15/2008	01-2008	2008-Q1	48,980

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-06	1/15/2008	01-2008	2008-Q1	1,160
RSVE-07	1/15/2008	01-2008	2008-Q1	113
RSVE-08	1/15/2008	01-2008	2008-Q1	5,300
RSVE-09	1/15/2008	01-2008	2008-Q1	10
RSVE-10	1/15/2008	01-2008	2008-Q1	1,306
RSVE-01	1/29/2008	01-2008	2008-Q1	465
RSVE-02	1/29/2008	01-2008	2008-Q1	938
RSVE-03	1/29/2008	01-2008	2008-Q1	115,000
RSVE-04	1/29/2008	01-2008	2008-Q1	38,400
RSVE-05	1/29/2008	01-2008	2008-Q1	42,650
RSVE-06	1/29/2008	01-2008	2008-Q1	907
RSVE-07	1/29/2008	01-2008	2008-Q1	129
RSVE-08	1/29/2008	01-2008	2008-Q1	11,080
RSVE-09	1/29/2008	01-2008	2008-Q1	16
RSVE-10	1/29/2008	01-2008	2008-Q1	2,501
RSVE-01	2/19/2008	02-2008	2008-Q1	241
RSVE-02	2/19/2008	02-2008	2008-Q1	1,020
RSVE-03	2/19/2008	02-2008	2008-Q1	99,000
RSVE-04	2/19/2008	02-2008	2008-Q1	3,906
RSVE-05	2/19/2008	02-2008	2008-Q1	44,720
RSVE-06	2/19/2008	02-2008	2008-Q1	719
RSVE-07	2/19/2008	02-2008	2008-Q1	35
RSVE-08	2/19/2008	02-2008	2008-Q1	4,560
RSVE-09	2/19/2008	02-2008	2008-Q1	15
RSVE-10	2/19/2008	02-2008	2008-Q1	445
RSVE-01	3/5/2008	03-2008	2008-Q1	315
RSVE-02	3/5/2008	03-2008	2008-Q1	2,240
RSVE-04	3/5/2008	03-2008	2008-Q1	4,082
RSVE-05	3/6/2008	03-2008	2008-Q1	40,050
RSVE-06	3/6/2008	03-2008	2008-Q1	941
RSVE-03	3/6/2008	03-2008	2008-Q1	152,000
RSVE-07	3/6/2008	03-2008	2008-Q1	3,008
RSVE-08	3/6/2008	03-2008	2008-Q1	4,640
RSVE-09	3/6/2008	03-2008	2008-Q1	17
RSVE-10	3/6/2008	03-2008	2008-Q1	78
RSVE-01	3/18/2008	03-2008	2008-Q1	335
RSVE-02	3/18/2008	03-2008	2008-Q1	6,250
RSVE-03	3/18/2008	03-2008	2008-Q1	175,000
RSVE-04	3/18/2008	03-2008	2008-Q1	4,082
RSVE-06	3/18/2008	03-2008	2008-Q1	612
RSVE-07	3/18/2008	03-2008	2008-Q1	83
RSVE-08	3/18/2008	03-2008	2008-Q1	13,210
RSVE-09	3/18/2008	03-2008	2008-Q1	16
RSVE-10	3/18/2008	03-2008	2008-Q1	430
RSVE-01	4/1/2008	04-2008	2008-Q2	140
RSVE-02	4/1/2008	04-2008	2008-Q2	10,060
RSVE-03	4/1/2008	04-2008	2008-Q2	223,000
RSVE-04	4/1/2008	04-2008	2008-Q2	5,410
RSVE-05	4/1/2008	04-2008	2008-Q2	86,410

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-06	4/1/2008	04-2008	2008-Q2	435
RSVE-07	4/1/2008	04-2008	2008-Q2	213
RSVE-08	4/1/2008	04-2008	2008-Q2	21,080
RSVE-09	4/1/2008	04-2008	2008-Q2	220
RSVE-10	4/1/2008	04-2008	2008-Q2	715
RSVE-01	4/15/2008	04-2008	2008-Q2	80
RSVE-02	4/15/2008	04-2008	2008-Q2	2,140
RSVE-03	4/15/2008	04-2008	2008-Q2	226,000
RSVE-04	4/15/2008	04-2008	2008-Q2	2,158
RSVE-05	4/15/2008	04-2008	2008-Q2	80,890
RSVE-06	4/15/2008	04-2008	2008-Q2	379
RSVE-07	4/15/2008	04-2008	2008-Q2	88
RSVE-08	4/15/2008	04-2008	2008-Q2	45,690
RSVE-09	4/15/2008	04-2008	2008-Q2	37
RSVE-10	4/15/2008	04-2008	2008-Q2	105
RSVE-01	4/30/2008	04-2008	2008-Q2	582
RSVE-02	4/30/2008	04-2008	2008-Q2	1,290
RSVE-03	4/30/2008	04-2008	2008-Q2	154,000
RSVE-04	4/30/2008	04-2008	2008-Q2	2,951
RSVE-05	4/30/2008	04-2008	2008-Q2	73,450
RSVE-06	4/30/2008	04-2008	2008-Q2	545
RSVE-07	4/30/2008	04-2008	2008-Q2	520
RSVE-08	4/30/2008	04-2008	2008-Q2	47,010
RSVE-09	4/30/2008	04-2008	2008-Q2	344
RSVE-10	4/30/2008	04-2008	2008-Q2	1,238
RSVE-01	5/14/2008	05-2008	2008-Q2	1,246
RSVE-02	5/14/2008	05-2008	2008-Q2	695
RSVE-03	5/14/2008	05-2008	2008-Q2	145,000
RSVE-04	5/14/2008	05-2008	2008-Q2	2,631
RSVE-05	5/14/2008	05-2008	2008-Q2	76,110
RSVE-06	5/14/2008	05-2008	2008-Q2	500
RSVE-07	5/14/2008	05-2008	2008-Q2	191
RSVE-08	5/14/2008	05-2008	2008-Q2	42,930
RSVE-09	5/14/2008	05-2008	2008-Q2	535
RSVE-10	5/14/2008	05-2008	2008-Q2	363
RSVE-01	5/20/2008	05-2008	2008-Q2	1,722
RSVE-02	5/20/2008	05-2008	2008-Q2	765
RSVE-03	5/20/2008	05-2008	2008-Q2	132,000
RSVE-04	5/20/2008	05-2008	2008-Q2	2,479
RSVE-05	5/20/2008	05-2008	2008-Q2	66,030
RSVE-06	5/20/2008	05-2008	2008-Q2	813
RSVE-07	5/20/2008	05-2008	2008-Q2	239
RSVE-08	5/20/2008	05-2008	2008-Q2	50,430
RSVE-09	5/20/2008	05-2008	2008-Q2	1,491
RSVE-10	5/20/2008	05-2008	2008-Q2	2,290
RSVE-01	6/3/2008	06-2008	2008-Q2	3,710
RSVE-02	6/3/2008	06-2008	2008-Q2	1,370
RSVE-03	6/3/2008	06-2008	2008-Q2	126,000
RSVE-04	6/3/2008	06-2008	2008-Q2	2,630

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-05	6/3/2008	06-2008	2008-Q2	53,550
RSVE-06	6/3/2008	06-2008	2008-Q2	400
RSVE-07	6/3/2008	06-2008	2008-Q2	512
RSVE-08	6/3/2008	06-2008	2008-Q2	51,220
RSVE-09	6/3/2008	06-2008	2008-Q2	3,385
RSVE-10	6/3/2008	06-2008	2008-Q2	9,950
RSVE-01	6/17/2008	06-2008	2008-Q2	5,584
RSVE-02	6/17/2008	06-2008	2008-Q2	583
RSVE-03	6/17/2008	06-2008	2008-Q2	96,080
RSVE-04	6/17/2008	06-2008	2008-Q2	3,580
RSVE-05	6/17/2008	06-2008	2008-Q2	42,980
RSVE-06	6/17/2008	06-2008	2008-Q2	314
RSVE-07	6/17/2008	06-2008	2008-Q2	98
RSVE-08	6/17/2008	06-2008	2008-Q2	35,080
RSVE-09	6/17/2008	06-2008	2008-Q2	1,084
RSVE-10	6/17/2008	06-2008	2008-Q2	911
RSVE-01	7/1/2008	07-2008	2008-Q3	122
RSVE-02	7/1/2008	07-2008	2008-Q3	524
RSVE-03	7/1/2008	07-2008	2008-Q3	96,340
RSVE-04	7/1/2008	07-2008	2008-Q3	2,872
RSVE-05	7/1/2008	07-2008	2008-Q3	29,120
RSVE-06	7/1/2008	07-2008	2008-Q3	103
RSVE-07	7/1/2008	07-2008	2008-Q3	119
RSVE-08	7/1/2008	07-2008	2008-Q3	39,210
RSVE-09	7/1/2008	07-2008	2008-Q3	1,238
RSVE-10	7/1/2008	07-2008	2008-Q3	4,190
RSVE-01	7/15/2008	07-2008	2008-Q3	712
RSVE-02	7/15/2008	07-2008	2008-Q3	407
RSVE-03	7/15/2008	07-2008	2008-Q3	76,230
RSVE-04	7/15/2008	07-2008	2008-Q3	3,870
RSVE-05	7/15/2008	07-2008	2008-Q3	31,890
RSVE-06	7/15/2008	07-2008	2008-Q3	1,241
RSVE-07	7/15/2008	07-2008	2008-Q3	94
RSVE-08	7/15/2008	07-2008	2008-Q3	20,040
RSVE-09	7/15/2008	07-2008	2008-Q3	3,352
RSVE-10	7/15/2008	07-2008	2008-Q3	15,430
RSVE-01	7/29/2008	07-2008	2008-Q3	6,350
RSVE-02	7/29/2008	07-2008	2008-Q3	637
RSVE-03	7/29/2008	07-2008	2008-Q3	82,230
RSVE-04	7/29/2008	07-2008	2008-Q3	9,400
RSVE-05	7/29/2008	07-2008	2008-Q3	29,970
RSVE-06	7/29/2008	07-2008	2008-Q3	4,507
RSVE-07	7/29/2008	07-2008	2008-Q3	1,032
RSVE-08	7/29/2008	07-2008	2008-Q3	29,400
RSVE-09	7/29/2008	07-2008	2008-Q3	4,270
RSVE-10	7/29/2008	07-2008	2008-Q3	22,400
RSVE-01	8/19/2008	08-2008	2008-Q3	19,230
RSVE-02	8/19/2008	08-2008	2008-Q3	653
RSVE-03	8/19/2008	08-2008	2008-Q3	98,710

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-04	8/19/2008	08-2008	2008-Q3	13,310
RSVE-05	8/19/2008	08-2008	2008-Q3	62,580
RSVE-06	8/19/2008	08-2008	2008-Q3	2,322
RSVE-07	8/19/2008	08-2008	2008-Q3	1,145
RSVE-08	8/19/2008	08-2008	2008-Q3	60,480
RSVE-09	8/19/2008	08-2008	2008-Q3	638
RSVE-10	8/19/2008	08-2008	2008-Q3	2,410
RSVE-01	9/2/2008	09-2008	2008-Q3	15,370
RSVE-02	9/2/2008	09-2008	2008-Q3	1,750
RSVE-03	9/2/2008	09-2008	2008-Q3	114,000
RSVE-04	9/2/2008	09-2008	2008-Q3	12,710
RSVE-05	9/2/2008	09-2008	2008-Q3	26,690
RSVE-06	9/2/2008	09-2008	2008-Q3	2,612
RSVE-07	9/2/2008	09-2008	2008-Q3	1,820
RSVE-08	9/2/2008	09-2008	2008-Q3	60,180
RSVE-09	9/2/2008	09-2008	2008-Q3	504
RSVE-10	9/2/2008	09-2008	2008-Q3	15,630
RSVE-01	9/16/2008	09-2008	2008-Q3	25,070
RSVE-02	9/16/2008	09-2008	2008-Q3	459
RSVE-03	9/16/2008	09-2008	2008-Q3	126,000
RSVE-04	9/16/2008	09-2008	2008-Q3	16,820
RSVE-05	9/16/2008	09-2008	2008-Q3	86,720
RSVE-06	9/16/2008	09-2008	2008-Q3	3,286
RSVE-07	9/16/2008	09-2008	2008-Q3	551
RSVE-08	9/16/2008	09-2008	2008-Q3	6,573
RSVE-09	9/16/2008	09-2008	2008-Q3	45
RSVE-10	9/16/2008	09-2008	2008-Q3	24,700
RSVE-01	9/30/2008	09-2008	2008-Q3	8,410
RSVE-02	9/30/2008	09-2008	2008-Q3	488
RSVE-03	9/30/2008	09-2008	2008-Q3	130,000
RSVE-04	9/30/2008	09-2008	2008-Q3	8,450
RSVE-05	9/30/2008	09-2008	2008-Q3	68,540
RSVE-06	9/30/2008	09-2008	2008-Q3	545
RSVE-07	9/30/2008	09-2008	2008-Q3	529
RSVE-08	9/30/2008	09-2008	2008-Q3	33,940
RSVE-09	9/30/2008	09-2008	2008-Q3	283
RSVE-10	9/30/2008	09-2008	2008-Q3	488
RSVE-01	10/14/2008	10-2008	2008-Q4	11,950
RSVE-02	10/14/2008	10-2008	2008-Q4	1,080
RSVE-03	10/14/2008	10-2008	2008-Q4	124,000
RSVE-04	10/14/2008	10-2008	2008-Q4	13,030
RSVE-05	10/14/2008	10-2008	2008-Q4	62,710
RSVE-06	10/14/2008	10-2008	2008-Q4	3,319
RSVE-07	10/14/2008	10-2008	2008-Q4	859
RSVE-08	10/14/2008	10-2008	2008-Q4	46,630
RSVE-09	10/14/2008	10-2008	2008-Q4	263
RSVE-10	10/14/2008	10-2008	2008-Q4	7,801
RSVE-01	10/21/2008	10-2008	2008-Q4	9,960
RSVE-02	10/21/2008	10-2008	2008-Q4	671

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-03	10/21/2008	10-2008	2008-Q4	106,000
RSVE-04	10/21/2008	10-2008	2008-Q4	12,800
RSVE-05	10/21/2008	10-2008	2008-Q4	75,190
RSVE-06	10/21/2008	10-2008	2008-Q4	2,769
RSVE-07	10/21/2008	10-2008	2008-Q4	1,035
RSVE-08	10/21/2008	10-2008	2008-Q4	45,730
RSVE-09	10/21/2008	10-2008	2008-Q4	88
RSVE-10	10/21/2008	10-2008	2008-Q4	6,806
RSVE-01	11/4/2008	11-2008	2008-Q4	2,910
RSVE-02	11/4/2008	11-2008	2008-Q4	410
RSVE-03	11/4/2008	11-2008	2008-Q4	133,000
RSVE-04	11/4/2008	11-2008	2008-Q4	14,110
RSVE-05	11/4/2008	11-2008	2008-Q4	91,100
RSVE-06	11/4/2008	11-2008	2008-Q4	3,394
RSVE-07	11/4/2008	11-2008	2008-Q4	1,267
RSVE-08	11/4/2008	11-2008	2008-Q4	52,180
RSVE-09	11/4/2008	11-2008	2008-Q4	92
RSVE-10	11/4/2008	11-2008	2008-Q4	6,623
RSVE-01	12/2/2008	12-2008	2008-Q4	564
RSVE-02	12/2/2008	12-2008	2008-Q4	282
RSVE-03	12/2/2008	12-2008	2008-Q4	147,000
RSVE-04	12/2/2008	12-2008	2008-Q4	15,710
RSVE-05	12/2/2008	12-2008	2008-Q4	25,190
RSVE-06	12/2/2008	12-2008	2008-Q4	6,307
RSVE-07	12/2/2008	12-2008	2008-Q4	1,267
RSVE-08	12/2/2008	12-2008	2008-Q4	32,640
RSVE-09	12/2/2008	12-2008	2008-Q4	22
RSVE-10	12/2/2008	12-2008	2008-Q4	5,023
RSVE-01	12/16/2008	12-2008	2008-Q4	372
RSVE-02	12/16/2008	12-2008	2008-Q4	146
RSVE-03	12/16/2008	12-2008	2008-Q4	162,000
RSVE-04	12/16/2008	12-2008	2008-Q4	20,800
RSVE-05	12/16/2008	12-2008	2008-Q4	33,670
RSVE-06	12/16/2008	12-2008	2008-Q4	3,755
RSVE-07	12/16/2008	12-2008	2008-Q4	810
RSVE-08	12/16/2008	12-2008	2008-Q4	26,380
RSVE-09	12/16/2008	12-2008	2008-Q4	18
RSVE-10	12/16/2008	12-2008	2008-Q4	4,691
RSVE-01	1/6/2009	01-2009	2009-Q1	145
RSVE-02	1/6/2009	01-2009	2009-Q1	244
RSVE-03	1/6/2009	01-2009	2009-Q1	241,000
RSVE-04	1/6/2009	01-2009	2009-Q1	4,710
RSVE-05	1/6/2009	01-2009	2009-Q1	30,620
RSVE-06	1/6/2009	01-2009	2009-Q1	1,940
RSVE-07	1/6/2009	01-2009	2009-Q1	1,101
RSVE-08	1/6/2009	01-2009	2009-Q1	36,040
RSVE-09	1/6/2009	01-2009	2009-Q1	23
RSVE-10	1/6/2009	01-2009	2009-Q1	7,577
RSVE-01	1/20/2009	01-2009	2009-Q1	10

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-02	1/20/2009	01-2009	2009-Q1	128
RSVE-03	1/20/2009	01-2009	2009-Q1	132,000
RSVE-04	1/20/2009	01-2009	2009-Q1	3,341
RSVE-05	1/20/2009	01-2009	2009-Q1	20,630
RSVE-06	1/20/2009	01-2009	2009-Q1	1,813
RSVE-07	1/20/2009	01-2009	2009-Q1	1,007
RSVE-08	1/20/2009	01-2009	2009-Q1	20,890
RSVE-09	1/20/2009	01-2009	2009-Q1	6
RSVE-10	1/20/2009	01-2009	2009-Q1	4,710
RSVE-01	2/5/2009	02-2009	2009-Q1	12
RSVE-02	2/5/2009	02-2009	2009-Q1	111
RSVE-03	2/5/2009	02-2009	2009-Q1	164,000
RSVE-04	2/5/2009	02-2009	2009-Q1	5,016
RSVE-05	2/5/2009	02-2009	2009-Q1	31,110
RSVE-06	2/5/2009	02-2009	2009-Q1	1,601
RSVE-07	2/5/2009	02-2009	2009-Q1	1,041
RSVE-08	2/5/2009	02-2009	2009-Q1	23,950
RSVE-09	2/5/2009	02-2009	2009-Q1	17
RSVE-10	2/5/2009	02-2009	2009-Q1	3,831
RSVE-01	2/17/2009	02-2009	2009-Q1	14
RSVE-02	2/17/2009	02-2009	2009-Q1	554
RSVE-03	2/17/2009	02-2009	2009-Q1	174,000
RSVE-04	2/17/2009	02-2009	2009-Q1	4,420
RSVE-05	2/17/2009	02-2009	2009-Q1	68,710
RSVE-06	2/17/2009	02-2009	2009-Q1	1,913
RSVE-07	2/17/2009	02-2009	2009-Q1	735
RSVE-08	2/17/2009	02-2009	2009-Q1	22,730
RSVE-09	2/17/2009	02-2009	2009-Q1	13
RSVE-10	2/17/2009	02-2009	2009-Q1	1,942
RSVE-01	3/3/2009	03-2009	2009-Q1	7
RSVE-02	3/3/2009	03-2009	2009-Q1	90
RSVE-03	3/3/2009	03-2009	2009-Q1	151,000
RSVE-04	3/3/2009	03-2009	2009-Q1	2,497
RSVE-05	3/3/2009	03-2009	2009-Q1	42,510
RSVE-06	3/3/2009	03-2009	2009-Q1	1,113
RSVE-07	3/3/2009	03-2009	2009-Q1	330
RSVE-08	3/3/2009	03-2009	2009-Q1	5,249
RSVE-09	3/3/2009	03-2009	2009-Q1	7
RSVE-10	3/3/2009	03-2009	2009-Q1	4,042
RSVE-01	3/17/2009	03-2009	2009-Q1	21
RSVE-02	3/17/2009	03-2009	2009-Q1	263
RSVE-03	3/17/2009	03-2009	2009-Q1	205,000
RSVE-04	3/17/2009	03-2009	2009-Q1	3,277
RSVE-05	3/17/2009	03-2009	2009-Q1	58,250
RSVE-06	3/17/2009	03-2009	2009-Q1	2,297
RSVE-07	3/17/2009	03-2009	2009-Q1	423
RSVE-08	3/17/2009	03-2009	2009-Q1	11,600
RSVE-09	3/17/2009	03-2009	2009-Q1	27
RSVE-10	3/17/2009	03-2009	2009-Q1	7,527

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-01	4/7/2009	04-2009	2009-Q2	14
RSVE-02	4/7/2009	04-2009	2009-Q2	351
RSVE-03	4/7/2009	04-2009	2009-Q2	215,000
RSVE-04	4/7/2009	04-2009	2009-Q2	2,810
RSVE-05	4/7/2009	04-2009	2009-Q2	79,730
RSVE-06	4/7/2009	04-2009	2009-Q2	1,634
RSVE-07	4/7/2009	04-2009	2009-Q2	408
RSVE-08	4/7/2009	04-2009	2009-Q2	17,100
RSVE-09	4/7/2009	04-2009	2009-Q2	9
RSVE-10	4/7/2009	04-2009	2009-Q2	1,840
RSVE-01	4/21/2009	04-2009	2009-Q2	1,290
RSVE-02	4/21/2009	04-2009	2009-Q2	427
RSVE-03	4/21/2009	04-2009	2009-Q2	147,000
RSVE-04	4/21/2009	04-2009	2009-Q2	4,600
RSVE-05	4/21/2009	04-2009	2009-Q2	61,630
RSVE-06	4/21/2009	04-2009	2009-Q2	3,384
RSVE-07	4/21/2009	04-2009	2009-Q2	876
RSVE-08	4/21/2009	04-2009	2009-Q2	24,630
RSVE-09	4/21/2009	04-2009	2009-Q2	8
RSVE-10	4/21/2009	04-2009	2009-Q2	3,186
RSVE-01	5/5/2009	05-2009	2009-Q2	2,049
RSVE-02	5/5/2009	05-2009	2009-Q2	37
RSVE-03	5/5/2009	05-2009	2009-Q2	170,000
RSVE-04	5/5/2009	05-2009	2009-Q2	8,620
RSVE-05	5/5/2009	05-2009	2009-Q2	63,920
RSVE-06	5/5/2009	05-2009	2009-Q2	1,773
RSVE-07	5/5/2009	05-2009	2009-Q2	595
RSVE-08	5/5/2009	05-2009	2009-Q2	12,830
RSVE-09	5/5/2009	05-2009	2009-Q2	6
RSVE-10	5/5/2009	05-2009	2009-Q2	279
RSVE-01	5/19/2009	05-2009	2009-Q2	2,504
RSVE-02	5/19/2009	05-2009	2009-Q2	423
RSVE-03	5/19/2009	05-2009	2009-Q2	166,000
RSVE-04	5/19/2009	05-2009	2009-Q2	8,555
RSVE-05	5/19/2009	05-2009	2009-Q2	36,290
RSVE-06	5/19/2009	05-2009	2009-Q2	1,986
RSVE-07	5/19/2009	05-2009	2009-Q2	560
RSVE-08	5/19/2009	05-2009	2009-Q2	19,030
RSVE-09	5/19/2009	05-2009	2009-Q2	8
RSVE-10	5/19/2009	05-2009	2009-Q2	334
RSVE-01	6/9/2009	06-2009	2009-Q2	2,590
RSVE-02	6/9/2009	06-2009	2009-Q2	785
RSVE-03	6/9/2009	06-2009	2009-Q2	144,000
RSVE-04	6/9/2009	06-2009	2009-Q2	9,220
RSVE-05	6/9/2009	06-2009	2009-Q2	18,040
RSVE-06	6/9/2009	06-2009	2009-Q2	1,412
RSVE-07	6/9/2009	06-2009	2009-Q2	958
RSVE-08	6/9/2009	06-2009	2009-Q2	26,060
RSVE-09	6/9/2009	06-2009	2009-Q2	115

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WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-10	6/9/2009	06-2009	2009-Q2	798
RSVE-01	6/23/2009	06-2009	2009-Q2	54
RSVE-02	6/23/2009	06-2009	2009-Q2	86
RSVE-03	6/23/2009	06-2009	2009-Q2	136,000
RSVE-04	6/23/2009	06-2009	2009-Q2	12,400
RSVE-05	6/23/2009	06-2009	2009-Q2	19,580
RSVE-06	6/23/2009	06-2009	2009-Q2	1,315
RSVE-07	6/23/2009	06-2009	2009-Q2	1,142
RSVE-08	6/23/2009	06-2009	2009-Q2	40,310
RSVE-09	6/23/2009	06-2009	2009-Q2	30
RSVE-10	6/23/2009	06-2009	2009-Q2	327
RSVE-01	8/18/2009	08-2009	2009-Q3	19,200
RSVE-03	8/18/2009	08-2009	2009-Q3	131,000
RSVE-04	8/18/2009	08-2009	2009-Q3	18,630
RSVE-05	8/18/2009	08-2009	2009-Q3	19,530
RSVE-06	8/18/2009	08-2009	2009-Q3	1,018
RSVE-07	8/18/2009	08-2009	2009-Q3	3,963
RSVE-08	8/18/2009	08-2009	2009-Q3	41,050
RSVE-09	8/18/2009	08-2009	2009-Q3	11
RSVE-10	8/18/2009	08-2009	2009-Q3	569
RSVE-01	10/20/2009	10-2009	2009-Q4	852
RSVE-02	10/20/2009	10-2009	2009-Q4	5,070
RSVE-03	10/20/2009	10-2009	2009-Q4	190,000
RSVE-04	10/20/2009	10-2009	2009-Q4	9,061
RSVE-05	10/20/2009	10-2009	2009-Q4	22,880
RSVE-06	10/20/2009	10-2009	2009-Q4	454
RSVE-07	10/20/2009	10-2009	2009-Q4	498
RSVE-08	10/20/2009	10-2009	2009-Q4	21,690
RSVE-09	10/20/2009	10-2009	2009-Q4	3
RSVE-10	10/20/2009	10-2009	2009-Q4	716
RSVE-01	11/17/2009	11-2009	2009-Q4	25,380
RSVE-02	11/17/2009	11-2009	2009-Q4	495
RSVE-03	11/17/2009	11-2009	2009-Q4	29,500
RSVE-04	11/17/2009	11-2009	2009-Q4	6,781
RSVE-05	11/17/2009	11-2009	2009-Q4	20,090
RSVE-06	11/17/2009	11-2009	2009-Q4	606
RSVE-07	11/17/2009	11-2009	2009-Q4	1,255
RSVE-08	11/17/2009	11-2009	2009-Q4	12,150
RSVE-09	11/17/2009	11-2009	2009-Q4	16
RSVE-01	12/15/2009	12-2009	2009-Q4	15,410
RSVE-02	12/15/2009	12-2009	2009-Q4	25
RSVE-03	12/15/2009	12-2009	2009-Q4	108,000
RSVE-04	12/15/2009	12-2009	2009-Q4	17,100
RSVE-05	12/15/2009	12-2009	2009-Q4	29,550
RSVE-06	12/15/2009	12-2009	2009-Q4	382
RSVE-07	12/15/2009	12-2009	2009-Q4	379
RSVE-08	12/15/2009	12-2009	2009-Q4	29,010
RSVE-09	12/15/2009	12-2009	2009-Q4	2
RSVE-10	12/15/2009	12-2009	2009-Q4	171

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WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-01	1/19/2010	01-2010	2010-Q1	22,650
RSVE-02	1/19/2010	01-2010	2010-Q1	51
RSVE-03	1/19/2010	01-2010	2010-Q1	127,000
RSVE-04	1/19/2010	01-2010	2010-Q1	22,520
RSVE-05	1/19/2010	01-2010	2010-Q1	21,670
RSVE-06	1/19/2010	01-2010	2010-Q1	151
RSVE-07	1/19/2010	01-2010	2010-Q1	630
RSVE-08	1/19/2010	01-2010	2010-Q1	9,610
RSVE-09	1/19/2010	01-2010	2010-Q1	6
RSVE-10	1/19/2010	01-2010	2010-Q1	11,700
RSVE-01	2/16/2010	02-2010	2010-Q1	43,500
RSVE-02	2/16/2010	02-2010	2010-Q1	38
RSVE-03	2/16/2010	02-2010	2010-Q1	175,000
RSVE-04	2/16/2010	02-2010	2010-Q1	19,840
RSVE-05	2/16/2010	02-2010	2010-Q1	44,140
RSVE-06	2/16/2010	02-2010	2010-Q1	481
RSVE-07	2/16/2010	02-2010	2010-Q1	680
RSVE-08	2/16/2010	02-2010	2010-Q1	10,100
RSVE-09	2/16/2010	02-2010	2010-Q1	8
RSVE-10	2/16/2010	02-2010	2010-Q1	2,254
RSVE-01	3/16/2010	03-2010	2010-Q1	48,500
RSVE-02	3/16/2010	03-2010	2010-Q1	1,490
RSVE-03	3/16/2010	03-2010	2010-Q1	222,000
RSVE-04	3/16/2010	03-2010	2010-Q1	25,500
RSVE-05	3/16/2010	03-2010	2010-Q1	3,919
RSVE-06	3/16/2010	03-2010	2010-Q1	765
RSVE-07	3/16/2010	03-2010	2010-Q1	860
RSVE-08	3/16/2010	03-2010	2010-Q1	12,000
RSVE-09	3/16/2010	03-2010	2010-Q1	6
RSVE-10	3/16/2010	03-2010	2010-Q1	1,022
RSVE-01	4/13/2010	04-2010	2010-Q2	10,900
RSVE-02	4/13/2010	04-2010	2010-Q2	11,150
RSVE-03	4/13/2010	04-2010	2010-Q2	160,000
RSVE-04	4/13/2010	04-2010	2010-Q2	5,320
RSVE-05	4/13/2010	04-2010	2010-Q2	37,120
RSVE-06	4/13/2010	04-2010	2010-Q2	402
RSVE-07	4/13/2010	04-2010	2010-Q2	270
RSVE-08	4/13/2010	04-2010	2010-Q2	7,924
RSVE-09	4/13/2010	04-2010	2010-Q2	58
RSVE-10	4/13/2010	04-2010	2010-Q2	499
RSVE-01	5/18/2010	05-2010	2010-Q2	328,000
RSVE-02	5/18/2010	05-2010	2010-Q2	3,650
RSVE-03	5/18/2010	05-2010	2010-Q2	132,000
RSVE-04	5/18/2010	05-2010	2010-Q2	92,310
RSVE-05	5/18/2010	05-2010	2010-Q2	7,890
RSVE-06	5/18/2010	05-2010	2010-Q2	2,209
RSVE-07	5/18/2010	05-2010	2010-Q2	669
RSVE-08	5/18/2010	05-2010	2010-Q2	7,035
RSVE-09	5/18/2010	05-2010	2010-Q2	5

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WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-10	5/18/2010	05-2010	2010-Q2	43,000
RSVE-01	6/16/2010	06-2010	2010-Q2	35,410
RSVE-02	6/15/2010	06-2010	2010-Q2	210
RSVE-03	6/15/2010	06-2010	2010-Q2	150,000
RSVE-04	6/16/2010	06-2010	2010-Q2	10,330
RSVE-05	6/16/2010	06-2010	2010-Q2	197,000
RSVE-06	6/16/2010	06-2010	2010-Q2	1,627
RSVE-07	6/15/2010	06-2010	2010-Q2	675
RSVE-08	6/15/2010	06-2010	2010-Q2	3,570
RSVE-09	6/15/2010	06-2010	2010-Q2	1,340
RSVE-10	6/15/2010	06-2010	2010-Q2	35,120
RSVE-01	7/13/2010	07-2010	2010-Q3	12,260
RSVE-02	7/13/2010	07-2010	2010-Q3	7,220
RSVE-03	7/13/2010	07-2010	2010-Q3	160,000
RSVE-04	7/13/2010	07-2010	2010-Q3	5,310
RSVE-05	7/13/2010	07-2010	2010-Q3	64,240
RSVE-06	7/13/2010	07-2010	2010-Q3	1,158
RSVE-07	7/13/2010	07-2010	2010-Q3	667
RSVE-08	7/13/2010	07-2010	2010-Q3	12,900
RSVE-09	7/13/2010	07-2010	2010-Q3	1,665
RSVE-10	7/13/2010	07-2010	2010-Q3	1,373
RSVE-01	8/17/2010	08-2010	2010-Q3	92,140
RSVE-02	8/17/2010	08-2010	2010-Q3	5,450
RSVE-03	8/17/2010	08-2010	2010-Q3	225,000
RSVE-04	8/17/2010	08-2010	2010-Q3	27,100
RSVE-05	8/17/2010	08-2010	2010-Q3	308,000
RSVE-06	8/17/2010	08-2010	2010-Q3	21,540
RSVE-07	8/17/2010	08-2010	2010-Q3	68
RSVE-08	8/17/2010	08-2010	2010-Q3	146,000
RSVE-09	8/17/2010	08-2010	2010-Q3	987
RSVE-10	8/17/2010	08-2010	2010-Q3	2,640
RSVE-01	9/21/2010	09-2010	2010-Q3	136,000
RSVE-02	9/21/2010	09-2010	2010-Q3	35,470
RSVE-03	9/21/2010	09-2010	2010-Q3	193,000
RSVE-04	9/21/2010	09-2010	2010-Q3	154,000
RSVE-05	9/21/2010	09-2010	2010-Q3	123,000
RSVE-06	9/21/2010	09-2010	2010-Q3	3,184
RSVE-07	9/21/2010	09-2010	2010-Q3	5,714
RSVE-08	9/21/2010	09-2010	2010-Q3	249,000
RSVE-09	9/21/2010	09-2010	2010-Q3	908
RSVE-10	9/21/2010	09-2010	2010-Q3	9,350
RSVE-01	10/19/2010	10-2010	2010-Q4	59,650
RSVE-02	10/19/2010	10-2010	2010-Q4	20,480
RSVE-03	10/19/2010	10-2010	2010-Q4	173,000
RSVE-04	10/19/2010	10-2010	2010-Q4	74,100
RSVE-05	10/19/2010	10-2010	2010-Q4	66,120
RSVE-06	10/19/2010	10-2010	2010-Q4	1,116
RSVE-07	10/19/2010	10-2010	2010-Q4	2,658
RSVE-08	10/19/2010	10-2010	2010-Q4	112,000

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WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-09	10/19/2010	10-2010	2010-Q4	480
RSVE-10	10/19/2010	10-2010	2010-Q4	3,704
RSVE-01	11/16/2010	11-2010	2010-Q4	38,930
RSVE-02	11/16/2010	11-2010	2010-Q4	9,970
RSVE-03	11/16/2010	11-2010	2010-Q4	214,000
RSVE-04	11/16/2010	11-2010	2010-Q4	55,690
RSVE-05	11/16/2010	11-2010	2010-Q4	63,720
RSVE-06	11/16/2010	11-2010	2010-Q4	613
RSVE-07	11/16/2010	11-2010	2010-Q4	2,867
RSVE-08	11/16/2010	11-2010	2010-Q4	117,000
RSVE-09	11/16/2010	11-2010	2010-Q4	138
RSVE-10	11/16/2010	11-2010	2010-Q4	11,400
RSVE-01	12/16/2010	12-2010	2010-Q4	57,350
RSVE-02	12/16/2010	12-2010	2010-Q4	972
RSVE-03	12/16/2010	12-2010	2010-Q4	117,000
RSVE-04	12/16/2010	12-2010	2010-Q4	19,200
RSVE-05	12/16/2010	12-2010	2010-Q4	111,000
RSVE-06	12/16/2010	12-2010	2010-Q4	651
RSVE-07	12/16/2010	12-2010	2010-Q4	3,475
RSVE-08	12/16/2010	12-2010	2010-Q4	77,040
RSVE-09	12/16/2010	12-2010	2010-Q4	67
RSVE-10	12/16/2010	12-2010	2010-Q4	8,407
RSVE-01	1/18/2011	01-2011	2011-Q1	45,790
RSVE-02	1/18/2011	01-2011	2011-Q1	3,040
RSVE-03	1/18/2011	01-2011	2011-Q1	271,000
RSVE-04	1/18/2011	01-2011	2011-Q1	26,700
RSVE-05	1/18/2011	01-2011	2011-Q1	130,000
RSVE-06	1/18/2011	01-2011	2011-Q1	1,763
RSVE-07	1/18/2011	01-2011	2011-Q1	3,310
RSVE-08	1/18/2011	01-2011	2011-Q1	76,530
RSVE-09	1/18/2011	01-2011	2011-Q1	24
RSVE-10	1/18/2011	01-2011	2011-Q1	8,301
RSVE-01	2/15/2011	02-2011	2011-Q1	68,340
RSVE-02	2/15/2011	02-2011	2011-Q1	1,350
RSVE-03	2/15/2011	02-2011	2011-Q1	369,000
RSVE-04	2/15/2011	02-2011	2011-Q1	42,510
RSVE-05	2/15/2011	02-2011	2011-Q1	214,000
RSVE-06	2/15/2011	02-2011	2011-Q1	1,768
RSVE-07	2/15/2011	02-2011	2011-Q1	2,912
RSVE-08	2/15/2011	02-2011	2011-Q1	16,700
RSVE-09	2/15/2011	02-2011	2011-Q1	37
RSVE-10	2/15/2011	02-2011	2011-Q1	53,120
RSVE-01	3/15/2011	03-2011	2011-Q1	35,780
RSVE-02	3/15/2011	03-2011	2011-Q1	32,650
RSVE-03	3/15/2011	03-2011	2011-Q1	428,000
RSVE-04	3/15/2011	03-2011	2011-Q1	13,850
RSVE-05	3/15/2011	03-2011	2011-Q1	151,000
RSVE-06	3/15/2011	03-2011	2011-Q1	197
RSVE-07	3/15/2011	03-2011	2011-Q1	992

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-08	3/15/2011	03-2011	2011-Q1	29,580
RSVE-09	3/15/2011	03-2011	2011-Q1	38
RSVE-10	3/15/2011	03-2011	2011-Q1	35,300
RSVE-01	4/19/2011	04-2011	2011-Q2	48,600
RSVE-02	4/19/2011	04-2011	2011-Q2	4,750
RSVE-03	4/19/2011	04-2011	2011-Q2	255,000
RSVE-04	4/19/2011	04-2011	2011-Q2	13,410
RSVE-05	4/19/2011	04-2011	2011-Q2	99,210
RSVE-06	4/19/2011	04-2011	2011-Q2	490
RSVE-07	4/19/2011	04-2011	2011-Q2	1,328
RSVE-08	4/19/2011	04-2011	2011-Q2	32,710
RSVE-09	4/19/2011	04-2011	2011-Q2	295
RSVE-10	4/19/2011	04-2011	2011-Q2	27,600
RSVE-01	5/17/2011	05-2011	2011-Q2	205,000
RSVE-02	5/17/2011	05-2011	2011-Q2	11,580
RSVE-03	5/17/2011	05-2011	2011-Q2	51,460
RSVE-04	5/17/2011	05-2011	2011-Q2	8,320
RSVE-05	5/17/2011	05-2011	2011-Q2	58,500
RSVE-06	5/17/2011	05-2011	2011-Q2	27
RSVE-07	5/17/2011	05-2011	2011-Q2	915
RSVE-08	5/17/2011	05-2011	2011-Q2	20,850
RSVE-09	5/17/2011	05-2011	2011-Q2	242
RSVE-10	5/17/2011	05-2011	2011-Q2	11
RSVE-01	6/21/2011	06-2011	2011-Q2	69,140
RSVE-02	6/21/2011	06-2011	2011-Q2	501
RSVE-03	6/21/2011	06-2011	2011-Q2	173,000
RSVE-04	6/21/2011	06-2011	2011-Q2	25,030
RSVE-05	6/21/2011	06-2011	2011-Q2	71,960
RSVE-06	6/21/2011	06-2011	2011-Q2	205
RSVE-07	6/21/2011	06-2011	2011-Q2	1,510
RSVE-08	6/21/2011	06-2011	2011-Q2	52,120
RSVE-09	6/21/2011	06-2011	2011-Q2	32
RSVE-10	6/21/2011	06-2011	2011-Q2	1,760
RSVE-01	7/19/2011	07-2011	2011-Q3	132,000
RSVE-02	7/19/2011	07-2011	2011-Q3	4,740
RSVE-03	7/19/2011	07-2011	2011-Q3	183,000
RSVE-04	7/19/2011	07-2011	2011-Q3	26,120
RSVE-05	7/19/2011	07-2011	2011-Q3	76,790
RSVE-06	7/19/2011	07-2011	2011-Q3	425
RSVE-07	7/19/2011	07-2011	2011-Q3	1,577
RSVE-08	7/19/2011	07-2011	2011-Q3	40,090
RSVE-09	7/19/2011	07-2011	2011-Q3	188
RSVE-10	7/19/2011	07-2011	2011-Q3	5,040
RSVE-01	8/16/2011	08-2011	2011-Q3	248,000
RSVE-02	8/16/2011	08-2011	2011-Q3	2,840
RSVE-03	8/16/2011	08-2011	2011-Q3	124,000
RSVE-04	8/16/2011	08-2011	2011-Q3	32,170
RSVE-05	8/16/2011	08-2011	2011-Q3	53,060
RSVE-06	8/16/2011	08-2011	2011-Q3	634

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-07	8/16/2011	08-2011	2011-Q3	861
RSVE-08	8/16/2011	08-2011	2011-Q3	18,650
RSVE-09	8/16/2011	08-2011	2011-Q3	310
RSVE-10	8/16/2011	08-2011	2011-Q3	1,292
RSVE-01	9/27/2011	09-2011	2011-Q3	94,820
RSVE-02	9/27/2011	09-2011	2011-Q3	8,910
RSVE-03	9/27/2011	09-2011	2011-Q3	193,000
RSVE-04	9/27/2011	09-2011	2011-Q3	47,150
RSVE-05	9/27/2011	09-2011	2011-Q3	71,650
RSVE-06	9/27/2011	09-2011	2011-Q3	1,145
RSVE-07	9/27/2011	09-2011	2011-Q3	3,512
RSVE-08	9/27/2011	09-2011	2011-Q3	79,660
RSVE-09	9/27/2011	09-2011	2011-Q3	275
RSVE-10	9/27/2011	09-2011	2011-Q3	320
RSVE-01	10/19/2011	10-2011	2011-Q4	101,000
RSVE-02	10/19/2011	10-2011	2011-Q4	3,310
RSVE-03	10/19/2011	10-2011	2011-Q4	250,000
RSVE-04	10/19/2011	10-2011	2011-Q4	39,150
RSVE-05	10/19/2011	10-2011	2011-Q4	140,000
RSVE-06	10/19/2011	10-2011	2011-Q4	1,740
RSVE-07	10/19/2011	10-2011	2011-Q4	3,804
RSVE-08	10/19/2011	10-2011	2011-Q4	76,850
RSVE-09	10/19/2011	10-2011	2011-Q4	207
RSVE-10	10/19/2011	10-2011	2011-Q4	6,435
RSVE-01	11/15/2011	11-2011	2011-Q4	63,250
RSVE-02	11/15/2011	11-2011	2011-Q4	7,980
RSVE-03	11/15/2011	11-2011	2011-Q4	274,000
RSVE-04	11/15/2011	11-2011	2011-Q4	19,810
RSVE-05	11/15/2011	11-2011	2011-Q4	156,000
RSVE-06	11/15/2011	11-2011	2011-Q4	1,874
RSVE-07	11/15/2011	11-2011	2011-Q4	3,457
RSVE-08	11/15/2011	11-2011	2011-Q4	51,030
RSVE-09	11/15/2011	11-2011	2011-Q4	158
RSVE-10	11/15/2011	11-2011	2011-Q4	3,203
RSVE-01	12/21/2011	12-2011	2011-Q4	89,290
RSVE-02	12/21/2011	12-2011	2011-Q4	4,020
RSVE-03	12/21/2011	12-2011	2011-Q4	463,000
RSVE-04	12/21/2011	12-2011	2011-Q4	40,110
RSVE-05	12/21/2011	12-2011	2011-Q4	301,000
RSVE-06	12/21/2011	12-2011	2011-Q4	2,228
RSVE-07	12/21/2011	12-2011	2011-Q4	2,748
RSVE-08	12/21/2011	12-2011	2011-Q4	80,090
RSVE-09	12/21/2011	12-2011	2011-Q4	167
RSVE-10	12/21/2011	12-2011	2011-Q4	630
RSVE-01	1/17/2012	01-2012	2012-Q1	70,120
RSVE-02	1/17/2012	01-2012	2012-Q1	16,350
RSVE-03	1/17/2012	01-2012	2012-Q1	369,000
RSVE-04	1/17/2012	01-2012	2012-Q1	32,000
RSVE-05	1/17/2012	01-2012	2012-Q1	161,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-06	1/17/2012	01-2012	2012-Q1	878
RSVE-07	1/17/2012	01-2012	2012-Q1	1,014
RSVE-08	1/17/2012	01-2012	2012-Q1	39,060
RSVE-09	1/17/2012	01-2012	2012-Q1	24
RSVE-10	1/17/2012	01-2012	2012-Q1	25,800
RSVE-01	2/21/2012	02-2012	2012-Q1	50,220
RSVE-02	2/21/2012	02-2012	2012-Q1	36,310
RSVE-03	2/21/2012	02-2012	2012-Q1	412,500
RSVE-04	2/21/2012	02-2012	2012-Q1	13,520
RSVE-05	2/21/2012	02-2012	2012-Q1	182,000
RSVE-06	2/21/2012	02-2012	2012-Q1	728
RSVE-07	2/21/2012	02-2012	2012-Q1	885
RSVE-08	2/21/2012	02-2012	2012-Q1	12,650
RSVE-09	2/21/2012	02-2012	2012-Q1	29
RSVE-10	2/21/2012	02-2012	2012-Q1	7,385
RSVE-01	3/13/2012	03-2012	2012-Q1	64,650
RSVE-02	3/13/2012	03-2012	2012-Q1	24,010
RSVE-03	3/13/2012	03-2012	2012-Q1	270,000
RSVE-04	3/13/2012	03-2012	2012-Q1	38,100
RSVE-05	3/13/2012	03-2012	2012-Q1	57,270
RSVE-06	3/13/2012	03-2012	2012-Q1	994
RSVE-07	3/13/2012	03-2012	2012-Q1	1,052
RSVE-08	3/13/2012	03-2012	2012-Q1	6,440
RSVE-09	3/13/2012	03-2012	2012-Q1	10
RSVE-10	3/13/2012	03-2012	2012-Q1	6,058
RSVE-01	4/10/2012	04-2012	2012-Q2	40,590
RSVE-02	4/10/2012	04-2012	2012-Q2	27,010
RSVE-03	4/10/2012	04-2012	2012-Q2	140,000
RSVE-04	4/10/2012	04-2012	2012-Q2	6,054
RSVE-05	4/10/2012	04-2012	2012-Q2	66,820
RSVE-06	4/10/2012	04-2012	2012-Q2	991
RSVE-07	4/10/2012	04-2012	2012-Q2	870
RSVE-08	4/10/2012	04-2012	2012-Q2	5,041
RSVE-09	4/10/2012	04-2012	2012-Q2	13
RSVE-10	4/10/2012	04-2012	2012-Q2	6,103
RSVE-01	5/15/2012	05-2012	2012-Q2	60,040
RSVE-02	5/15/2012	05-2012	2012-Q2	23,590
RSVE-03	5/15/2012	05-2012	2012-Q2	127,000
RSVE-04	5/15/2012	05-2012	2012-Q2	19,000
RSVE-05	5/15/2012	05-2012	2012-Q2	70,220
RSVE-06	5/15/2012	05-2012	2012-Q2	223
RSVE-07	5/15/2012	05-2012	2012-Q2	496
RSVE-08	5/15/2012	05-2012	2012-Q2	10,350
RSVE-09	5/15/2012	05-2012	2012-Q2	20
RSVE-10	5/15/2012	05-2012	2012-Q2	5,214
RSVE-01	6/12/2012	06-2012	2012-Q2	98,630
RSVE-02	6/12/2012	06-2012	2012-Q2	18,480
RSVE-03	6/12/2012	06-2012	2012-Q2	129,000
RSVE-04	6/12/2012	06-2012	2012-Q2	46,140

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-05	6/12/2012	06-2012	2012-Q2	73,160
RSVE-06	6/12/2012	06-2012	2012-Q2	1,102
RSVE-07	6/12/2012	06-2012	2012-Q2	861
RSVE-08	6/12/2012	06-2012	2012-Q2	15,480
RSVE-09	6/12/2012	06-2012	2012-Q2	15
RSVE-10	6/12/2012	06-2012	2012-Q2	5,557
RSVE-01	7/25/2012	07-2012	2012-Q3	73,610
RSVE-02	7/25/2012	07-2012	2012-Q3	7,410
RSVE-03	7/25/2012	07-2012	2012-Q3	131,000
RSVE-04	7/25/2012	07-2012	2012-Q3	58,890
RSVE-05	7/25/2012	07-2012	2012-Q3	94,710
RSVE-06	7/25/2012	07-2012	2012-Q3	1,474
RSVE-07	7/25/2012	07-2012	2012-Q3	1,534
RSVE-08	7/25/2012	07-2012	2012-Q3	14,960
RSVE-09	7/25/2012	07-2012	2012-Q3	15
RSVE-10	7/25/2012	07-2012	2012-Q3	2,225
RSVE-01	8/21/2012	08-2012	2012-Q3	57,700
RSVE-02	8/21/2012	08-2012	2012-Q3	4,080
RSVE-03	8/21/2012	08-2012	2012-Q3	116,000
RSVE-04	8/21/2012	08-2012	2012-Q3	4,079
RSVE-05	8/21/2012	08-2012	2012-Q3	93,740
RSVE-06	8/21/2012	08-2012	2012-Q3	654
RSVE-07	8/21/2012	08-2012	2012-Q3	1,549
RSVE-08	8/21/2012	08-2012	2012-Q3	820
RSVE-09	8/21/2012	08-2012	2012-Q3	14
RSVE-10	8/21/2012	08-2012	2012-Q3	6,547
RSVE-01	9/18/2012	09-2012	2012-Q3	21,180
RSVE-02	9/18/2012	09-2012	2012-Q3	2,150
RSVE-03	9/18/2012	09-2012	2012-Q3	70,110
RSVE-04	9/18/2012	09-2012	2012-Q3	3,766
RSVE-05	9/18/2012	09-2012	2012-Q3	72,630
RSVE-06	9/18/2012	09-2012	2012-Q3	485
RSVE-07	9/18/2012	09-2012	2012-Q3	889
RSVE-08	9/18/2012	09-2012	2012-Q3	3,155
RSVE-09	9/18/2012	09-2012	2012-Q3	7
RSVE-10	9/18/2012	09-2012	2012-Q3	4,294
RSVE-01	10/2/2012	10-2012	2012-Q4	21,180
RSVE-02	10/2/2012	10-2012	2012-Q4	5,080
RSVE-03	10/2/2012	10-2012	2012-Q4	211,000
RSVE-04	10/2/2012	10-2012	2012-Q4	9,620
RSVE-05	10/2/2012	10-2012	2012-Q4	90,700
RSVE-06	10/2/2012	10-2012	2012-Q4	362
RSVE-07	10/2/2012	10-2012	2012-Q4	922
RSVE-08	10/2/2012	10-2012	2012-Q4	2,948
RSVE-09	10/2/2012	10-2012	2012-Q4	7
RSVE-10	10/2/2012	10-2012	2012-Q4	16
RSVE-01	11/20/2012	11-2012	2012-Q4	7,950
RSVE-02	11/20/2012	11-2012	2012-Q4	2,650
RSVE-03	11/20/2012	11-2012	2012-Q4	141,000

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WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-04	11/20/2012	11-2012	2012-Q4	5,394
RSVE-05	11/20/2012	11-2012	2012-Q4	40,020
RSVE-06	11/20/2012	11-2012	2012-Q4	441
RSVE-07	11/20/2012	11-2012	2012-Q4	391
RSVE-08	11/20/2012	11-2012	2012-Q4	1,237
RSVE-09	11/20/2012	11-2012	2012-Q4	234
RSVE-10	11/20/2012	11-2012	2012-Q4	3,236
RSVE-01	12/26/2012	12-2012	2012-Q4	5,200
RSVE-02	12/26/2012	12-2012	2012-Q4	326
RSVE-03	12/26/2012	12-2012	2012-Q4	74,120
RSVE-04	12/26/2012	12-2012	2012-Q4	2,312
RSVE-05	12/26/2012	12-2012	2012-Q4	26,210
RSVE-06	12/26/2012	12-2012	2012-Q4	212
RSVE-07	12/26/2012	12-2012	2012-Q4	239
RSVE-08	12/26/2012	12-2012	2012-Q4	1,183
RSVE-09	12/26/2012	12-2012	2012-Q4	6
RSVE-10	12/26/2012	12-2012	2012-Q4	3,002
RSVE-01	1/15/2013	01-2013	2013-Q1	4,980
RSVE-02	1/15/2013	01-2013	2013-Q1	268
RSVE-03	1/15/2013	01-2013	2013-Q1	46,120
RSVE-04	1/15/2013	01-2013	2013-Q1	3,108
RSVE-05	1/15/2013	01-2013	2013-Q1	24,310
RSVE-06	1/15/2013	01-2013	2013-Q1	182
RSVE-07	1/15/2013	01-2013	2013-Q1	128
RSVE-08	1/15/2013	01-2013	2013-Q1	678
RSVE-09	1/15/2013	01-2013	2013-Q1	7
RSVE-10	1/15/2013	01-2013	2013-Q1	172
RSVE-01	2/19/2013	02-2013	2013-Q1	910
RSVE-02	2/19/2013	02-2013	2013-Q1	142
RSVE-03	2/19/2013	02-2013	2013-Q1	26,180
RSVE-04	2/19/2013	02-2013	2013-Q1	830
RSVE-05	2/19/2013	02-2013	2013-Q1	15,800
RSVE-06	2/19/2013	02-2013	2013-Q1	150
RSVE-07	2/19/2013	02-2013	2013-Q1	41
RSVE-08	2/19/2013	02-2013	2013-Q1	499
RSVE-09	2/19/2013	02-2013	2013-Q1	7
RSVE-10	2/19/2013	02-2013	2013-Q1	3,484
RSVE-01	3/19/2013	03-2013	2013-Q1	2,865
RSVE-02	3/19/2013	03-2013	2013-Q1	184
RSVE-03	3/19/2013	03-2013	2013-Q1	12,320
RSVE-04	3/19/2013	03-2013	2013-Q1	2,042
RSVE-05	3/19/2013	03-2013	2013-Q1	17,100
RSVE-06	3/19/2013	03-2013	2013-Q1	160
RSVE-07	3/19/2013	03-2013	2013-Q1	25
RSVE-08	3/19/2013	03-2013	2013-Q1	560
RSVE-09	3/19/2013	03-2013	2013-Q1	3
RSVE-10	3/19/2013	03-2013	2013-Q1	55
RSVE-01	4/24/2013	04-2013	2013-Q2	2,920
RSVE-02	4/24/2013	04-2013	2013-Q2	10,390

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-03	4/24/2013	04-2013	2013-Q2	97,940
RSVE-04	4/24/2013	04-2013	2013-Q2	671
RSVE-05	4/24/2013	04-2013	2013-Q2	22,310
RSVE-06	4/24/2013	04-2013	2013-Q2	838
RSVE-07	4/24/2013	04-2013	2013-Q2	13
RSVE-08	4/24/2013	04-2013	2013-Q2	489
RSVE-10	4/24/2013	04-2013	2013-Q2	4,302
RSVE-01	5/23/2013	05-2013	2013-Q2	16,850
RSVE-02	5/23/2013	05-2013	2013-Q2	11,130
RSVE-03	5/23/2013	05-2013	2013-Q2	46,070
RSVE-04	5/23/2013	05-2013	2013-Q2	13,480
RSVE-05	5/23/2013	05-2013	2013-Q2	24,430
RSVE-06	5/23/2013	05-2013	2013-Q2	32
RSVE-07	5/23/2013	05-2013	2013-Q2	7
RSVE-08	5/23/2013	05-2013	2013-Q2	130
RSVE-09	5/23/2013	05-2013	2013-Q2	2
RSVE-10	5/23/2013	05-2013	2013-Q2	5
RSVE-01	6/18/2013	06-2013	2013-Q2	7,903
RSVE-02	6/18/2013	06-2013	2013-Q2	438
RSVE-03	6/18/2013	06-2013	2013-Q2	28,730
RSVE-04	6/18/2013	06-2013	2013-Q2	2,073
RSVE-05	6/18/2013	06-2013	2013-Q2	25,080
RSVE-06	6/18/2013	06-2013	2013-Q2	973
RSVE-07	6/18/2013	06-2013	2013-Q2	3,010
RSVE-08	6/18/2013	06-2013	2013-Q2	3,240
RSVE-09	6/18/2013	06-2013	2013-Q2	7,458
RSVE-10	6/18/2013	06-2013	2013-Q2	9,147
RSVE-01	7/16/2013	07-2013	2013-Q3	31,350
RSVE-03	7/16/2013	07-2013	2013-Q3	31,850
RSVE-04	7/16/2013	07-2013	2013-Q3	47,310
RSVE-05	7/16/2013	07-2013	2013-Q3	31,060
RSVE-06	7/16/2013	07-2013	2013-Q3	367
RSVE-07	7/16/2013	07-2013	2013-Q3	13
RSVE-08	7/16/2013	07-2013	2013-Q3	4,542
RSVE-09	7/16/2013	07-2013	2013-Q3	6
RSVE-10	7/16/2013	07-2013	2013-Q3	790
RSVE-01	8/20/2013	08-2013	2013-Q3	19,860
RSVE-02	8/20/2013	08-2013	2013-Q3	3,540
RSVE-03	8/20/2013	08-2013	2013-Q3	77,340
RSVE-04	8/20/2013	08-2013	2013-Q3	60,140
RSVE-05	8/20/2013	08-2013	2013-Q3	50,710
RSVE-06	8/20/2013	08-2013	2013-Q3	519
RSVE-07	8/20/2013	08-2013	2013-Q3	17
RSVE-08	8/20/2013	08-2013	2013-Q3	3,614
RSVE-09	8/20/2013	08-2013	2013-Q3	5
RSVE-10	8/20/2013	08-2013	2013-Q3	5,401
RSVE-01	9/17/2013	09-2013	2013-Q3	24,320
RSVE-02	9/17/2013	09-2013	2013-Q3	4,270
RSVE-03	9/17/2013	09-2013	2013-Q3	107,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-04	9/17/2013	09-2013	2013-Q3	56,050
RSVE-05	9/17/2013	09-2013	2013-Q3	95,160
RSVE-06	9/17/2013	09-2013	2013-Q3	481
RSVE-07	9/17/2013	09-2013	2013-Q3	180
RSVE-08	9/17/2013	09-2013	2013-Q3	2,802
RSVE-09	9/17/2013	09-2013	2013-Q3	12
RSVE-10	9/17/2013	09-2013	2013-Q3	4,418
RSVE-01	10/3/2013	10-2013	2013-Q4	4,350
RSVE-02	10/3/2013	10-2013	2013-Q4	5,700
RSVE-03	10/3/2013	10-2013	2013-Q4	143,000
RSVE-04	10/3/2013	10-2013	2013-Q4	48,680
RSVE-05	10/3/2013	10-2013	2013-Q4	74,240
RSVE-06	10/3/2013	10-2013	2013-Q4	440
RSVE-07	10/3/2013	10-2013	2013-Q4	580
RSVE-08	10/3/2013	10-2013	2013-Q4	3,989
RSVE-09	10/3/2013	10-2013	2013-Q4	101
RSVE-10	10/3/2013	10-2013	2013-Q4	7,934
RSVE-01	11/19/2013	11-2013	2013-Q4	192
RSVE-02	11/19/2013	11-2013	2013-Q4	386
RSVE-03	11/19/2013	11-2013	2013-Q4	120,000
RSVE-04	11/19/2013	11-2013	2013-Q4	5,041
RSVE-05	11/19/2013	11-2013	2013-Q4	92,230
RSVE-06	11/19/2013	11-2013	2013-Q4	325
RSVE-07	11/19/2013	11-2013	2013-Q4	424
RSVE-08	11/19/2013	11-2013	2013-Q4	6,388
RSVE-09	11/19/2013	11-2013	2013-Q4	4
RSVE-10	11/19/2013	11-2013	2013-Q4	1,192
RSVE-01	12/17/2013	12-2013	2013-Q4	21
RSVE-02	12/17/2013	12-2013	2013-Q4	202
RSVE-03	12/17/2013	12-2013	2013-Q4	121,000
RSVE-04	12/17/2013	12-2013	2013-Q4	4,031
RSVE-05	12/17/2013	12-2013	2013-Q4	35,210
RSVE-06	12/17/2013	12-2013	2013-Q4	319
RSVE-07	12/17/2013	12-2013	2013-Q4	509
RSVE-08	12/17/2013	12-2013	2013-Q4	1,970
RSVE-09	12/17/2013	12-2013	2013-Q4	7
RSVE-10	12/17/2013	12-2013	2013-Q4	13,300
RSVE-01	1/30/2014	01-2014	2014-Q1	129
RSVE-02	1/30/2014	01-2014	2014-Q1	149
RSVE-03	1/30/2014	01-2014	2014-Q1	81,680
RSVE-04	1/30/2014	01-2014	2014-Q1	1,671
RSVE-05	1/30/2014	01-2014	2014-Q1	20,480
RSVE-06	1/30/2014	01-2014	2014-Q1	192
RSVE-07	1/30/2014	01-2014	2014-Q1	29
RSVE-08	1/30/2014	01-2014	2014-Q1	169
RSVE-09	1/30/2014	01-2014	2014-Q1	8
RSVE-10	1/30/2014	01-2014	2014-Q1	8,630
RSVE-01	2/25/2014	02-2014	2014-Q1	62
RSVE-02	2/25/2014	02-2014	2014-Q1	60

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-03	2/25/2014	02-2014	2014-Q1	13,450
RSVE-04	2/25/2014	02-2014	2014-Q1	3,873
RSVE-05	2/25/2014	02-2014	2014-Q1	10,410
RSVE-06	2/25/2014	02-2014	2014-Q1	129
RSVE-07	2/25/2014	02-2014	2014-Q1	45
RSVE-08	2/25/2014	02-2014	2014-Q1	42
RSVE-09	2/25/2014	02-2014	2014-Q1	3
RSVE-10	2/25/2014	02-2014	2014-Q1	589
RSVE-01	3/18/2014	03-2014	2014-Q1	67
RSVE-02	3/18/2014	03-2014	2014-Q1	86
RSVE-03	3/18/2014	03-2014	2014-Q1	6,040
RSVE-04	3/18/2014	03-2014	2014-Q1	1,332
RSVE-05	3/18/2014	03-2014	2014-Q1	13,720
RSVE-06	3/18/2014	03-2014	2014-Q1	141
RSVE-07	3/18/2014	03-2014	2014-Q1	51
RSVE-09	3/18/2014	03-2014	2014-Q1	3
RSVE-10	3/18/2014	03-2014	2014-Q1	734
RSVE-01	4/15/2014	04-2014	2014-Q2	15
RSVE-02	4/15/2014	04-2014	2014-Q2	91
RSVE-03	4/15/2014	04-2014	2014-Q2	13,510
RSVE-04	4/15/2014	04-2014	2014-Q2	1,740
RSVE-05	4/15/2014	04-2014	2014-Q2	9,410
RSVE-06	4/15/2014	04-2014	2014-Q2	72
RSVE-07	4/15/2014	04-2014	2014-Q2	5
RSVE-08	4/15/2014	04-2014	2014-Q2	93
RSVE-09	4/15/2014	04-2014	2014-Q2	3
RSVE-10	4/15/2014	04-2014	2014-Q2	3,712
RSVE-10	5/20/2014	05-2014	2014-Q2	87
RSVE-09	5/20/2014	05-2014	2014-Q2	2
RSVE-08	5/20/2014	05-2014	2014-Q2	34
RSVE-07	5/20/2014	05-2014	2014-Q2	19
RSVE-06	5/20/2014	05-2014	2014-Q2	102
RSVE-05	5/20/2014	05-2014	2014-Q2	14,810
RSVE-04	5/20/2014	05-2014	2014-Q2	1,027
RSVE-01	5/20/2014	05-2014	2014-Q2	954
RSVE-02	5/20/2014	05-2014	2014-Q2	126
RSVE-03	5/20/2014	05-2014	2014-Q2	95,230
RSVE-01	6/24/2014	06-2014	2014-Q2	1,654
RSVE-02	6/24/2014	06-2014	2014-Q2	11,620
RSVE-03	6/24/2014	06-2014	2014-Q2	100,000
RSVE-04	6/24/2014	06-2014	2014-Q2	4,800
RSVE-05	6/24/2014	06-2014	2014-Q2	16,880
RSVE-06	6/24/2014	06-2014	2014-Q2	71
RSVE-07	6/24/2014	06-2014	2014-Q2	21
RSVE-08	6/24/2014	06-2014	2014-Q2	394
RSVE-09	6/24/2014	06-2014	2014-Q2	14
RSVE-10	6/24/2014	06-2014	2014-Q2	2,508
RSVE-01	7/29/2014	07-2014	2014-Q3	9,072
RSVE-02	7/29/2014	07-2014	2014-Q3	12,580

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-03	7/29/2014	07-2014	2014-Q3	69,040
RSVE-04	7/29/2014	07-2014	2014-Q3	15,400
RSVE-05	7/29/2014	07-2014	2014-Q3	24,050
RSVE-06	7/29/2014	07-2014	2014-Q3	1,116
RSVE-07	7/29/2014	07-2014	2014-Q3	50
RSVE-08	7/29/2014	07-2014	2014-Q3	4,488
RSVE-09	7/29/2014	07-2014	2014-Q3	3
RSVE-10	7/29/2014	07-2014	2014-Q3	1,089
RSVE-01	8/27/2014	08-2014	2014-Q3	11,100
RSVE-02	8/27/2014	08-2014	2014-Q3	28,410
RSVE-03	8/27/2014	08-2014	2014-Q3	93,840
RSVE-04	8/27/2014	08-2014	2014-Q3	21,540
RSVE-05	8/27/2014	08-2014	2014-Q3	31,960
RSVE-06	8/27/2014	08-2014	2014-Q3	49
RSVE-07	8/27/2014	08-2014	2014-Q3	99
RSVE-08	8/27/2014	08-2014	2014-Q3	5,480
RSVE-09	8/27/2014	08-2014	2014-Q3	98
RSVE-10	8/27/2014	08-2014	2014-Q3	10,100
RSVE-01	9/26/2014	09-2014	2014-Q3	5,694
RSVE-02	9/26/2014	09-2014	2014-Q3	30,060
RSVE-03	9/26/2014	09-2014	2014-Q3	106,000
RSVE-04	9/26/2014	09-2014	2014-Q3	44,000
RSVE-05	9/26/2014	09-2014	2014-Q3	42,240
RSVE-06	9/26/2014	09-2014	2014-Q3	53
RSVE-07	9/26/2014	09-2014	2014-Q3	19
RSVE-08	9/26/2014	09-2014	2014-Q3	1,073
RSVE-09	9/26/2014	09-2014	2014-Q3	24
RSVE-10	9/26/2014	09-2014	2014-Q3	8,022
RSVE-01	10/7/2014	10-2014	2014-Q4	10,500
RSVE-02	10/7/2014	10-2014	2014-Q4	64,580
RSVE-03	10/7/2014	10-2014	2014-Q4	105,000
RSVE-04	10/7/2014	10-2014	2014-Q4	25,190
RSVE-05	10/7/2014	10-2014	2014-Q4	38,020
RSVE-06	10/7/2014	10-2014	2014-Q4	475
RSVE-07	10/7/2014	10-2014	2014-Q4	50
RSVE-08	10/7/2014	10-2014	2014-Q4	5,607
RSVE-09	10/7/2014	10-2014	2014-Q4	7
RSVE-10	10/7/2014	10-2014	2014-Q4	180
RSVE-01	11/19/2014	11-2014	2014-Q4	19,600
RSVE-02	11/19/2014	11-2014	2014-Q4	34,210
RSVE-03	11/19/2014	11-2014	2014-Q4	104,000
RSVE-04	11/19/2014	11-2014	2014-Q4	37,400
RSVE-05	11/19/2014	11-2014	2014-Q4	105,000
RSVE-06	11/19/2014	11-2014	2014-Q4	225
RSVE-07	11/19/2014	11-2014	2014-Q4	76
RSVE-08	11/19/2014	11-2014	2014-Q4	3,130
RSVE-09	11/19/2014	11-2014	2014-Q4	46
RSVE-10	11/19/2014	11-2014	2014-Q4	12,000
RSVE-01	12/16/2014	12-2014	2014-Q4	15,600

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-02	12/16/2014	12-2014	2014-Q4	48,810
RSVE-03	12/16/2014	12-2014	2014-Q4	156,000
RSVE-04	12/16/2014	12-2014	2014-Q4	16,100
RSVE-05	12/16/2014	12-2014	2014-Q4	59,430
RSVE-06	12/16/2014	12-2014	2014-Q4	95
RSVE-07	12/16/2014	12-2014	2014-Q4	101
RSVE-08	12/16/2014	12-2014	2014-Q4	1,374
RSVE-09	12/16/2014	12-2014	2014-Q4	15
RSVE-10	12/16/2014	12-2014	2014-Q4	4,281
RSVE-01	1/22/2015	01-2015	2015-Q1	3,359
RSVE-02	1/22/2015	01-2015	2015-Q1	340
RSVE-03	1/22/2015	01-2015	2015-Q1	171,000
RSVE-04	1/22/2015	01-2015	2015-Q1	7,520
RSVE-05	1/22/2015	01-2015	2015-Q1	20,900
RSVE-06	1/22/2015	01-2015	2015-Q1	200
RSVE-07	1/22/2015	01-2015	2015-Q1	88
RSVE-08	1/22/2015	01-2015	2015-Q1	670
RSVE-09	1/22/2015	01-2015	2015-Q1	20
RSVE-10	1/22/2015	01-2015	2015-Q1	5,708
RSVE-01	2/25/2015	02-2015	2015-Q1	63
RSVE-02	2/25/2015	02-2015	2015-Q1	874
RSVE-03	2/25/2015	02-2015	2015-Q1	115,000
RSVE-04	2/25/2015	02-2015	2015-Q1	646
RSVE-05	2/25/2015	02-2015	2015-Q1	32,850
RSVE-06	2/25/2015	02-2015	2015-Q1	302
RSVE-07	2/25/2015	02-2015	2015-Q1	208
RSVE-08	2/25/2015	02-2015	2015-Q1	225
RSVE-09	2/25/2015	02-2015	2015-Q1	37
RSVE-10	2/25/2015	02-2015	2015-Q1	3,852
RSVE-01	3/30/2015	03-2015	2015-Q1	24
RSVE-02	3/30/2015	03-2015	2015-Q1	153
RSVE-03	3/30/2015	03-2015	2015-Q1	95,120
RSVE-04	3/30/2015	03-2015	2015-Q1	540
RSVE-05	3/30/2015	03-2015	2015-Q1	13,090
RSVE-06	3/30/2015	03-2015	2015-Q1	92
RSVE-07	3/30/2015	03-2015	2015-Q1	33
RSVE-08	3/30/2015	03-2015	2015-Q1	401
RSVE-09	3/30/2015	03-2015	2015-Q1	14
RSVE-10	3/30/2015	03-2015	2015-Q1	308
RSVE-01	4/29/2015	04-2015	2015-Q2	50
RSVE-02	4/29/2015	04-2015	2015-Q2	19
RSVE-03	4/29/2015	04-2015	2015-Q2	107,000
RSVE-04	4/29/2015	04-2015	2015-Q2	364
RSVE-05	4/29/2015	04-2015	2015-Q2	6,015
RSVE-06	4/29/2015	04-2015	2015-Q2	8
RSVE-07	4/29/2015	04-2015	2015-Q2	5
RSVE-08	4/29/2015	04-2015	2015-Q2	11
RSVE-09	4/29/2015	04-2015	2015-Q2	3
RSVE-10	4/29/2015	04-2015	2015-Q2	5,811

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-01	5/28/2015	05-2015	2015-Q2	161
RSVE-02	5/28/2015	05-2015	2015-Q2	93
RSVE-03	5/28/2015	05-2015	2015-Q2	165,000
RSVE-04	5/28/2015	05-2015	2015-Q2	1,630
RSVE-05	5/28/2015	05-2015	2015-Q2	22,040
RSVE-06	5/28/2015	05-2015	2015-Q2	115
RSVE-07	5/28/2015	05-2015	2015-Q2	48
RSVE-08	5/28/2015	05-2015	2015-Q2	600
RSVE-09	5/28/2015	05-2015	2015-Q2	30
RSVE-10	5/28/2015	05-2015	2015-Q2	4,890
RSVE-01	6/23/2015	06-2015	2015-Q2	652
RSVE-02	6/23/2015	06-2015	2015-Q2	5,575
RSVE-03	6/23/2015	06-2015	2015-Q2	50,520
RSVE-04	6/23/2015	06-2015	2015-Q2	51
RSVE-05	6/23/2015	06-2015	2015-Q2	11,790
RSVE-06	6/23/2015	06-2015	2015-Q2	20
RSVE-07	6/23/2015	06-2015	2015-Q2	70
RSVE-08	6/23/2015	06-2015	2015-Q2	3,674
RSVE-09	6/23/2015	06-2015	2015-Q2	5
RSVE-10	6/23/2015	06-2015	2015-Q2	1,033
RSVE-01	7/30/2015	07-2015	2015-Q3	4,328
RSVE-02	7/30/2015	07-2015	2015-Q3	1,400
RSVE-03	7/30/2015	07-2015	2015-Q3	46,180
RSVE-04	7/30/2015	07-2015	2015-Q3	15,260
RSVE-05	7/30/2015	07-2015	2015-Q3	3,247
RSVE-06	7/30/2015	07-2015	2015-Q3	439
RSVE-07	7/30/2015	07-2015	2015-Q3	13
RSVE-08	7/30/2015	07-2015	2015-Q3	1,297
RSVE-09	7/30/2015	07-2015	2015-Q3	16
RSVE-10	7/30/2015	07-2015	2015-Q3	1,251
RSVE-01	8/26/2015	08-2015	2015-Q3	1,204
RSVE-02	8/26/2015	08-2015	2015-Q3	612
RSVE-03	8/26/2015	08-2015	2015-Q3	30,380
RSVE-04	8/26/2015	08-2015	2015-Q3	26,300
RSVE-05	8/26/2015	08-2015	2015-Q3	18,240
RSVE-06	8/26/2015	08-2015	2015-Q3	163
RSVE-07	8/26/2015	08-2015	2015-Q3	70
RSVE-08	8/26/2015	08-2015	2015-Q3	2,628
RSVE-09	8/26/2015	08-2015	2015-Q3	22
RSVE-10	8/26/2015	08-2015	2015-Q3	654
RSVE-01	9/23/2015	09-2015	2015-Q3	2,306
RSVE-02	9/23/2015	09-2015	2015-Q3	630
RSVE-03	9/23/2015	09-2015	2015-Q3	30,800
RSVE-04	9/23/2015	09-2015	2015-Q3	20,300
RSVE-05	9/23/2015	09-2015	2015-Q3	25,400
RSVE-06	9/23/2015	09-2015	2015-Q3	22
RSVE-07	9/23/2015	09-2015	2015-Q3	103
RSVE-08	9/23/2015	09-2015	2015-Q3	2,479
RSVE-09	9/23/2015	09-2015	2015-Q3	7

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WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-10	9/23/2015	09-2015	2015-Q3	7,745
RSVE-01	10/6/2015	10-2015	2015-Q4	15,600
RSVE-02	10/6/2015	10-2015	2015-Q4	1,510
RSVE-03	10/6/2015	10-2015	2015-Q4	39,420
RSVE-04	10/6/2015	10-2015	2015-Q4	48,650
RSVE-05	10/6/2015	10-2015	2015-Q4	50,740
RSVE-06	10/6/2015	10-2015	2015-Q4	91
RSVE-07	10/6/2015	10-2015	2015-Q4	388
RSVE-08	10/6/2015	10-2015	2015-Q4	12,300
RSVE-09	10/6/2015	10-2015	2015-Q4	581
RSVE-10	10/6/2015	10-2015	2015-Q4	12,500
RSVE-01	11/19/2015	11-2015	2015-Q4	5,462
RSVE-02	11/19/2015	11-2015	2015-Q4	604
RSVE-03	11/19/2015	11-2015	2015-Q4	146,000
RSVE-04	11/19/2015	11-2015	2015-Q4	153,000
RSVE-05	11/19/2015	11-2015	2015-Q4	164,000
RSVE-06	11/19/2015	11-2015	2015-Q4	370
RSVE-07	11/19/2015	11-2015	2015-Q4	736
RSVE-08	11/19/2015	11-2015	2015-Q4	34,750
RSVE-09	11/19/2015	11-2015	2015-Q4	80
RSVE-10	11/19/2015	11-2015	2015-Q4	1,769
RSVE-01	12/16/2015	12-2015	2015-Q4	5,407
RSVE-02	12/16/2015	12-2015	2015-Q4	499
RSVE-03	12/16/2015	12-2015	2015-Q4	143,000
RSVE-04	12/16/2015	12-2015	2015-Q4	22,810
RSVE-05	12/16/2015	12-2015	2015-Q4	181,000
RSVE-06	12/16/2015	12-2015	2015-Q4	176
RSVE-07	12/16/2015	12-2015	2015-Q4	198
RSVE-08	12/16/2015	12-2015	2015-Q4	22,900
RSVE-09	12/16/2015	12-2015	2015-Q4	67
RSVE-10	12/16/2015	12-2015	2015-Q4	20,500
RSVE-01	1/28/2016	01-2016	2016-Q1	5,614
RSVE-02	1/28/2016	01-2016	2016-Q1	27
RSVE-03	1/28/2016	01-2016	2016-Q1	79,780
RSVE-04	1/28/2016	01-2016	2016-Q1	12,250
RSVE-05	1/28/2016	01-2016	2016-Q1	52,840
RSVE-06	1/28/2016	01-2016	2016-Q1	0
RSVE-07	1/28/2016	01-2016	2016-Q1	96
RSVE-08	1/28/2016	01-2016	2016-Q1	6,249
RSVE-09	1/28/2016	01-2016	2016-Q1	23
RSVE-10	1/28/2016	01-2016	2016-Q1	1,446
RSVE-01	2/17/2016	02-2016	2016-Q1	1,252
RSVE-02	2/17/2016	02-2016	2016-Q1	10
RSVE-03	2/17/2016	02-2016	2016-Q1	26,900
RSVE-04	2/17/2016	02-2016	2016-Q1	9
RSVE-05	2/17/2016	02-2016	2016-Q1	15,500
RSVE-06	2/17/2016	02-2016	2016-Q1	7
RSVE-07	2/17/2016	02-2016	2016-Q1	2
RSVE-08	2/17/2016	02-2016	2016-Q1	3

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-09	2/17/2016	02-2016	2016-Q1	4
RSVE-10	2/17/2016	02-2016	2016-Q1	930
RSVE-01	2/29/2016	02-2016	2016-Q1	28,200
RSVE-02	2/29/2016	02-2016	2016-Q1	534
RSVE-03	2/29/2016	02-2016	2016-Q1	118,000
RSVE-04	2/29/2016	02-2016	2016-Q1	36,100
RSVE-05	2/29/2016	02-2016	2016-Q1	106,000
RSVE-06	2/29/2016	02-2016	2016-Q1	502
RSVE-07	2/29/2016	02-2016	2016-Q1	580
RSVE-08	2/29/2016	02-2016	2016-Q1	18,600
RSVE-09	2/29/2016	02-2016	2016-Q1	195
RSVE-10	2/29/2016	02-2016	2016-Q1	2,386
RSVE-01	3/15/2016	03-2016	2016-Q1	16,400
RSVE-02	3/15/2016	03-2016	2016-Q1	103
RSVE-03	3/15/2016	03-2016	2016-Q1	141,000
RSVE-04	3/15/2016	03-2016	2016-Q1	43,200
RSVE-05	3/15/2016	03-2016	2016-Q1	101,000
RSVE-06	3/15/2016	03-2016	2016-Q1	508
RSVE-07	3/15/2016	03-2016	2016-Q1	590
RSVE-08	3/15/2016	03-2016	2016-Q1	32,100
RSVE-09	3/15/2016	03-2016	2016-Q1	51
RSVE-10	3/15/2016	03-2016	2016-Q1	14,100
RSVE-01	4/28/2016	04-2016	2016-Q2	33,200
RSVE-02	4/28/2016	04-2016	2016-Q2	2,700
RSVE-03	4/28/2016	04-2016	2016-Q2	126,000
RSVE-04	4/28/2016	04-2016	2016-Q2	136,000
RSVE-05	4/28/2016	04-2016	2016-Q2	91,420
RSVE-06	4/28/2016	04-2016	2016-Q2	1,192
RSVE-07	4/28/2016	04-2016	2016-Q2	2,520
RSVE-08	4/28/2016	04-2016	2016-Q2	40,100
RSVE-09	4/28/2016	04-2016	2016-Q2	101
RSVE-10	4/28/2016	04-2016	2016-Q2	6,804
RSVE-01	5/26/2016	05-2016	2016-Q2	21,840
RSVE-02	5/26/2016	05-2016	2016-Q2	4,120
RSVE-03	5/26/2016	05-2016	2016-Q2	124,000
RSVE-04	5/26/2016	05-2016	2016-Q2	25,230
RSVE-05	5/26/2016	05-2016	2016-Q2	54,420
RSVE-06	5/26/2016	05-2016	2016-Q2	824
RSVE-07	5/26/2016	05-2016	2016-Q2	1,520
RSVE-08	5/26/2016	05-2016	2016-Q2	5,084
RSVE-09	5/26/2016	05-2016	2016-Q2	395
RSVE-10	5/26/2016	05-2016	2016-Q2	2,038
RSVE-01	6/14/2016	06-2016	2016-Q2	40,960
RSVE-02	6/14/2016	06-2016	2016-Q2	1,530
RSVE-03	6/14/2016	06-2016	2016-Q2	95,460
RSVE-04	6/14/2016	06-2016	2016-Q2	34,130
RSVE-05	6/14/2016	06-2016	2016-Q2	59,050
RSVE-06	6/14/2016	06-2016	2016-Q2	1,112
RSVE-07	6/14/2016	06-2016	2016-Q2	1,365

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-08	6/14/2016	06-2016	2016-Q2	7,240
RSVE-09	6/14/2016	06-2016	2016-Q2	440
RSVE-10	6/14/2016	06-2016	2016-Q2	5,230
RSVE-01	8/5/2016	08-2016	2016-Q3	22,500
RSVE-02	8/5/2016	08-2016	2016-Q3	5,820
RSVE-03	8/5/2016	08-2016	2016-Q3	124,000
RSVE-04	8/5/2016	08-2016	2016-Q3	2,842
RSVE-05	8/5/2016	08-2016	2016-Q3	80,500
RSVE-06	8/5/2016	08-2016	2016-Q3	368
RSVE-07	8/5/2016	08-2016	2016-Q3	863
RSVE-08	8/5/2016	08-2016	2016-Q3	10,200
RSVE-09	8/5/2016	08-2016	2016-Q3	91
RSVE-10	8/5/2016	08-2016	2016-Q3	2,456
RSVE-01	8/16/2016	08-2016	2016-Q3	50,080
RSVE-02	8/16/2016	08-2016	2016-Q3	2,960
RSVE-03	8/16/2016	08-2016	2016-Q3	72,900
RSVE-04	8/16/2016	08-2016	2016-Q3	156,000
RSVE-05	8/16/2016	08-2016	2016-Q3	63,950
RSVE-06	8/16/2016	08-2016	2016-Q3	1,906
RSVE-07	8/16/2016	08-2016	2016-Q3	1,080
RSVE-08	8/16/2016	08-2016	2016-Q3	10,800
RSVE-09	8/16/2016	08-2016	2016-Q3	488
RSVE-10	8/16/2016	08-2016	2016-Q3	13,200
RSVE-01	9/13/2016	09-2016	2016-Q3	33,020
RSVE-02	9/13/2016	09-2016	2016-Q3	2,406
RSVE-03	9/13/2016	09-2016	2016-Q3	115,000
RSVE-04	9/13/2016	09-2016	2016-Q3	86,250
RSVE-05	9/13/2016	09-2016	2016-Q3	102,000
RSVE-06	9/13/2016	09-2016	2016-Q3	1,090
RSVE-07	9/13/2016	09-2016	2016-Q3	2,127
RSVE-08	9/13/2016	09-2016	2016-Q3	70
RSVE-09	9/13/2016	09-2016	2016-Q3	70
RSVE-10	9/13/2016	09-2016	2016-Q3	2,390
RSVE-01	10/6/2016	10-2016	2016-Q4	32,860
RSVE-02	10/6/2016	10-2016	2016-Q4	5,900
RSVE-03	10/6/2016	10-2016	2016-Q4	102,000
RSVE-04	10/6/2016	10-2016	2016-Q4	64,100
RSVE-05	10/6/2016	10-2016	2016-Q4	102,000
RSVE-06	10/6/2016	10-2016	2016-Q4	816
RSVE-07	10/6/2016	10-2016	2016-Q4	1,498
RSVE-08	10/6/2016	10-2016	2016-Q4	3,870
RSVE-09	10/6/2016	10-2016	2016-Q4	12
RSVE-10	10/6/2016	10-2016	2016-Q4	3,210
RSVE-01	11/16/2016	11-2016	2016-Q4	29,500
RSVE-02	11/16/2016	11-2016	2016-Q4	6,900
RSVE-03	11/16/2016	11-2016	2016-Q4	135,000
RSVE-04	11/16/2016	11-2016	2016-Q4	66,780
RSVE-05	11/16/2016	11-2016	2016-Q4	163,000
RSVE-06	11/16/2016	11-2016	2016-Q4	645

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-07	11/16/2016	11-2016	2016-Q4	2,671
RSVE-08	11/16/2016	11-2016	2016-Q4	8,260
RSVE-09	11/16/2016	11-2016	2016-Q4	169
RSVE-10	11/16/2016	11-2016	2016-Q4	1,517
RSVE-01	12/13/2016	12-2016	2016-Q4	44,130
RSVE-02	12/13/2016	12-2016	2016-Q4	7,150
RSVE-03	12/13/2016	12-2016	2016-Q4	176,000
RSVE-04	12/13/2016	12-2016	2016-Q4	91,300
RSVE-05	12/13/2016	12-2016	2016-Q4	84,620
RSVE-06	12/13/2016	12-2016	2016-Q4	457
RSVE-07	12/13/2016	12-2016	2016-Q4	3,185
RSVE-08	12/13/2016	12-2016	2016-Q4	12,800
RSVE-09	12/13/2016	12-2016	2016-Q4	63
RSVE-10	12/13/2016	12-2016	2016-Q4	23,300
RSVE-01	1/24/2017	01-2017	2017-Q1	24,020
RSVE-02	1/24/2017	01-2017	2017-Q1	113,000
RSVE-03	1/24/2017	01-2017	2017-Q1	231,000
RSVE-04	1/24/2017	01-2017	2017-Q1	240,000
RSVE-05	1/24/2017	01-2017	2017-Q1	215,000
RSVE-06	1/24/2017	01-2017	2017-Q1	1,102
RSVE-07	1/24/2017	01-2017	2017-Q1	1,677
RSVE-08	1/24/2017	01-2017	2017-Q1	42,600
RSVE-09	1/24/2017	01-2017	2017-Q1	205
RSVE-10	1/24/2017	01-2017	2017-Q1	982
RSVE-01	2/23/2017	02-2017	2017-Q1	56,640
RSVE-02	2/23/2017	02-2017	2017-Q1	162,000
RSVE-03	2/23/2017	02-2017	2017-Q1	309,000
RSVE-04	2/23/2017	02-2017	2017-Q1	111,000
RSVE-05	2/23/2017	02-2017	2017-Q1	110,000
RSVE-06	2/23/2017	02-2017	2017-Q1	495
RSVE-07	2/23/2017	02-2017	2017-Q1	3,642
RSVE-08	2/23/2017	02-2017	2017-Q1	38,220
RSVE-09	2/23/2017	02-2017	2017-Q1	336
RSVE-10	2/23/2017	02-2017	2017-Q1	12,800
RSVE-01	3/8/2017	03-2017	2017-Q1	42,600
RSVE-02	3/8/2017	03-2017	2017-Q1	87,600
RSVE-03	3/8/2017	03-2017	2017-Q1	209,000
RSVE-04	3/8/2017	03-2017	2017-Q1	73,140
RSVE-05	3/8/2017	03-2017	2017-Q1	271,000
RSVE-06	3/8/2017	03-2017	2017-Q1	715
RSVE-07	3/8/2017	03-2017	2017-Q1	3,608
RSVE-08	3/8/2017	03-2017	2017-Q1	24,980
RSVE-09	3/8/2017	03-2017	2017-Q1	281
RSVE-10	3/8/2017	03-2017	2017-Q1	3,872
RSVE-01	4/25/2017	04-2017	2017-Q2	47,060
RSVE-02	4/25/2017	04-2017	2017-Q2	63,100
RSVE-03	4/25/2017	04-2017	2017-Q2	228,000
RSVE-04	4/25/2017	04-2017	2017-Q2	129,000
RSVE-05	4/25/2017	04-2017	2017-Q2	324,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-06	4/25/2017	04-2017	2017-Q2	220
RSVE-07	4/25/2017	04-2017	2017-Q2	3,218
RSVE-08	4/25/2017	04-2017	2017-Q2	52,810
RSVE-09	4/25/2017	04-2017	2017-Q2	175
RSVE-10	4/25/2017	04-2017	2017-Q2	6,271
RSVE-01	5/23/2017	05-2017	2017-Q2	1,285
RSVE-02	5/23/2017	05-2017	2017-Q2	1,821
RSVE-03	5/23/2017	05-2017	2017-Q2	67,050
RSVE-04	5/23/2017	05-2017	2017-Q2	14,100
RSVE-05	5/23/2017	05-2017	2017-Q2	244,000
RSVE-06	5/23/2017	05-2017	2017-Q2	176
RSVE-07	5/23/2017	05-2017	2017-Q2	1,670
RSVE-08	5/23/2017	05-2017	2017-Q2	1,235
RSVE-09	5/23/2017	05-2017	2017-Q2	251
RSVE-10	5/23/2017	05-2017	2017-Q2	4,716
RSVE-01	6/27/2017	06-2017	2017-Q2	88,950
RSVE-02	6/27/2017	06-2017	2017-Q2	550
RSVE-03	6/27/2017	06-2017	2017-Q2	181,000
RSVE-04	6/27/2017	06-2017	2017-Q2	222,000
RSVE-05	6/27/2017	06-2017	2017-Q2	240,000
RSVE-07	6/27/2017	06-2017	2017-Q2	4,608
RSVE-08	6/27/2017	06-2017	2017-Q2	2,206
RSVE-09	6/27/2017	06-2017	2017-Q2	112
RSVE-10	6/27/2017	06-2017	2017-Q2	495
RSVE-01	7/25/2017	07-2017	2017-Q3	26,390
RSVE-02	7/25/2017	07-2017	2017-Q3	27,050
RSVE-03	7/25/2017	07-2017	2017-Q3	153,000
RSVE-04	7/25/2017	07-2017	2017-Q3	123,000
RSVE-05	7/25/2017	07-2017	2017-Q3	132,000
RSVE-06	7/25/2017	07-2017	2017-Q3	348
RSVE-07	7/25/2017	07-2017	2017-Q3	1,420
RSVE-08	7/25/2017	07-2017	2017-Q3	9,109
RSVE-09	7/25/2017	07-2017	2017-Q3	67
RSVE-10	7/25/2017	07-2017	2017-Q3	531
RSVE-01	8/23/2017	08-2017	2017-Q3	61,430
RSVE-02	8/23/2017	08-2017	2017-Q3	32,450
RSVE-03	8/23/2017	08-2017	2017-Q3	151,000
RSVE-04	8/23/2017	08-2017	2017-Q3	163,000
RSVE-05	8/23/2017	08-2017	2017-Q3	245,000
RSVE-06	8/23/2017	08-2017	2017-Q3	486
RSVE-07	8/23/2017	08-2017	2017-Q3	2,510
RSVE-08	8/23/2017	08-2017	2017-Q3	13,440
RSVE-09	8/23/2017	08-2017	2017-Q3	190
RSVE-10	8/23/2017	08-2017	2017-Q3	1,961
RSVE-01	9/20/2017	09-2017	2017-Q3	101,000
RSVE-02	9/20/2017	09-2017	2017-Q3	30,280
RSVE-03	9/20/2017	09-2017	2017-Q3	204,000
RSVE-04	9/20/2017	09-2017	2017-Q3	126,000
RSVE-05	9/20/2017	09-2017	2017-Q3	225,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-06	9/20/2017	09-2017	2017-Q3	372
RSVE-07	9/20/2017	09-2017	2017-Q3	2,718
RSVE-08	9/20/2017	09-2017	2017-Q3	16,720
RSVE-09	9/20/2017	09-2017	2017-Q3	361
RSVE-10	9/20/2017	09-2017	2017-Q3	23,800
RSVE-01	10/19/2017	10-2017	2017-Q4	10,700
RSVE-02	10/19/2017	10-2017	2017-Q4	13,350
RSVE-03	10/19/2017	10-2017	2017-Q4	123,000
RSVE-04	10/19/2017	10-2017	2017-Q4	254,000
RSVE-05	10/19/2017	10-2017	2017-Q4	226,000
RSVE-06	10/19/2017	10-2017	2017-Q4	274
RSVE-07	10/19/2017	10-2017	2017-Q4	3,047
RSVE-08	10/19/2017	10-2017	2017-Q4	21,320
RSVE-09	10/19/2017	10-2017	2017-Q4	19
RSVE-10	10/19/2017	10-2017	2017-Q4	2,118
RSVE-01	11/7/2017	11-2017	2017-Q4	15,280
RSVE-02	11/7/2017	11-2017	2017-Q4	5,510
RSVE-03	11/7/2017	11-2017	2017-Q4	149,000
RSVE-04	11/7/2017	11-2017	2017-Q4	129,000
RSVE-05	11/7/2017	11-2017	2017-Q4	188,000
RSVE-06	11/7/2017	11-2017	2017-Q4	642
RSVE-07	11/7/2017	11-2017	2017-Q4	2,983
RSVE-08	11/7/2017	11-2017	2017-Q4	12,740
RSVE-09	11/7/2017	11-2017	2017-Q4	110
RSVE-10	11/7/2017	11-2017	2017-Q4	6,455
RSVE-01	12/13/2017	12-2017	2017-Q4	33,100
RSVE-02	12/13/2017	12-2017	2017-Q4	11,300
RSVE-03	12/13/2017	12-2017	2017-Q4	213,000
RSVE-04	12/13/2017	12-2017	2017-Q4	103,000
RSVE-05	12/13/2017	12-2017	2017-Q4	220,000
RSVE-06	12/13/2017	12-2017	2017-Q4	1,046
RSVE-07	12/13/2017	12-2017	2017-Q4	2,115
RSVE-08	12/13/2017	12-2017	2017-Q4	22,740
RSVE-09	12/13/2017	12-2017	2017-Q4	369
RSVE-10	12/13/2017	12-2017	2017-Q4	10,800
RSVE-01	1/10/2018	01-2018	2018-Q1	57,450
RSVE-02	1/10/2018	01-2018	2018-Q1	27,950
RSVE-03	1/10/2018	01-2018	2018-Q1	241,000
RSVE-04	1/10/2018	01-2018	2018-Q1	56,400
RSVE-05	1/10/2018	01-2018	2018-Q1	187,000
RSVE-06	1/10/2018	01-2018	2018-Q1	1,064
RSVE-08	1/10/2018	01-2018	2018-Q1	19,550
RSVE-09	1/10/2018	01-2018	2018-Q1	740
RSVE-10	1/10/2018	01-2018	2018-Q1	12,200
RSVE-01	2/27/2018	02-2018	2018-Q1	12,320
RSVE-02	2/27/2018	02-2018	2018-Q1	37,110
RSVE-03	2/27/2018	02-2018	2018-Q1	379,000
RSVE-04	2/27/2018	02-2018	2018-Q1	20,750
RSVE-05	2/27/2018	02-2018	2018-Q1	273,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-06	2/27/2018	02-2018	2018-Q1	155
RSVE-07	2/27/2018	02-2018	2018-Q1	2,073
RSVE-08	2/27/2018	02-2018	2018-Q1	64,440
RSVE-09	2/27/2018	02-2018	2018-Q1	7
RSVE-10	2/27/2018	02-2018	2018-Q1	23
RSVE-01	3/28/2018	03-2018	2018-Q1	15,380
RSVE-02	3/28/2018	03-2018	2018-Q1	49,020
RSVE-03	3/28/2018	03-2018	2018-Q1	38
RSVE-04	3/28/2018	03-2018	2018-Q1	159,425
RSVE-05	3/28/2018	03-2018	2018-Q1	241,375
RSVE-06	3/28/2018	03-2018	2018-Q1	601
RSVE-07	3/28/2018	03-2018	2018-Q1	8,080
RSVE-08	3/28/2018	03-2018	2018-Q1	37,860
RSVE-09	3/28/2018	03-2018	2018-Q1	235
RSVE-10	3/28/2018	03-2018	2018-Q1	34
RSVE-01	4/24/2018	04-2018	2018-Q2	23,125
RSVE-02	4/24/2018	04-2018	2018-Q2	102,275
RSVE-03	4/24/2018	04-2018	2018-Q2	295,000
RSVE-04	4/24/2018	04-2018	2018-Q2	59,475
RSVE-05	4/24/2018	04-2018	2018-Q2	124,825
RSVE-06	4/24/2018	04-2018	2018-Q2	20
RSVE-07	4/24/2018	04-2018	2018-Q2	3,940
RSVE-08	4/24/2018	04-2018	2018-Q2	15,980
RSVE-09	4/24/2018	04-2018	2018-Q2	29
RSVE-10	4/24/2018	04-2018	2018-Q2	3,073
RSVE-01	5/22/2018	05-2018	2018-Q2	9,940
RSVE-02	5/22/2018	05-2018	2018-Q2	75,420
RSVE-03	5/22/2018	05-2018	2018-Q2	422,000
RSVE-04	5/22/2018	05-2018	2018-Q2	91,290
RSVE-05	5/22/2018	05-2018	2018-Q2	175,000
RSVE-06	5/22/2018	05-2018	2018-Q2	261
RSVE-07	5/22/2018	05-2018	2018-Q2	6,952
RSVE-08	5/22/2018	05-2018	2018-Q2	30,530
RSVE-09	5/22/2018	05-2018	2018-Q2	655
RSVE-10	5/22/2018	05-2018	2018-Q2	2,837
RSVE-01	6/26/2018	06-2018	2018-Q2	9,080
RSVE-02	6/26/2018	06-2018	2018-Q2	117,575
RSVE-03	6/26/2018	06-2018	2018-Q2	762,500
RSVE-04	6/26/2018	06-2018	2018-Q2	128
RSVE-05	6/26/2018	06-2018	2018-Q2	502,500
RSVE-06	6/26/2018	06-2018	2018-Q2	145
RSVE-07	6/26/2018	06-2018	2018-Q2	587
RSVE-08	6/26/2018	06-2018	2018-Q2	190,300
RSVE-09	6/26/2018	06-2018	2018-Q2	390
RSVE-10	6/26/2018	06-2018	2018-Q2	145
RSVE-01	8/6/2018	08-2018	2018-Q3	5,800
RSVE-02	8/6/2018	08-2018	2018-Q3	71,570
RSVE-03	8/6/2018	08-2018	2018-Q3	303,000
RSVE-04	8/6/2018	08-2018	2018-Q3	113,000

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-05	8/6/2018	08-2018	2018-Q3	143,000
RSVE-06	8/6/2018	08-2018	2018-Q3	117
RSVE-07	8/6/2018	08-2018	2018-Q3	4,607
RSVE-08	8/6/2018	08-2018	2018-Q3	63,300
RSVE-09	8/6/2018	08-2018	2018-Q3	134
RSVE-10	8/6/2018	08-2018	2018-Q3	10,400
RSVE-01	12/11/2018	12-2018	2018-Q4	40,280
RSVE-02	12/11/2018	12-2018	2018-Q4	136,000
RSVE-03	12/11/2018	12-2018	2018-Q4	355,000
RSVE-04	12/11/2018	12-2018	2018-Q4	78,710
RSVE-05	12/11/2018	12-2018	2018-Q4	62,500
RSVE-06	12/11/2018	12-2018	2018-Q4	1,159
RSVE-07	12/11/2018	12-2018	2018-Q4	3,980
RSVE-08	12/11/2018	12-2018	2018-Q4	50,830
RSVE-09	12/11/2018	12-2018	2018-Q4	372
RSVE-10	12/11/2018	12-2018	2018-Q4	752
RSVE-01	1/28/2019	01-2019	2019-Q1	62,500
RSVE-02	1/28/2019	01-2019	2019-Q1	155,000
RSVE-03	1/28/2019	01-2019	2019-Q1	395,000
RSVE-04	1/28/2019	01-2019	2019-Q1	80,740
RSVE-05	1/28/2019	01-2019	2019-Q1	398,000
RSVE-06	1/28/2019	01-2019	2019-Q1	1,084
RSVE-07	1/28/2019	01-2019	2019-Q1	6,490
RSVE-08	1/28/2019	01-2019	2019-Q1	1,448
RSVE-09	1/28/2019	01-2019	2019-Q1	535
RSVE-10	1/28/2019	01-2019	2019-Q1	1,458
RSVE-01	5/16/2019	05-2019	2019-Q2	1,110
RSVE-03	5/16/2019	05-2019	2019-Q2	784
RSVE-04	5/16/2019	05-2019	2019-Q2	325
RSVE-05	5/16/2019	05-2019	2019-Q2	21,000
RSVE-06	5/16/2019	05-2019	2019-Q2	850
RSVE-07	5/16/2019	05-2019	2019-Q2	2,750
RSVE-08	5/16/2019	05-2019	2019-Q2	480
RSVE-09	5/16/2019	05-2019	2019-Q2	7
RSVE-10	5/16/2019	05-2019	2019-Q2	9,100
RSVE-01	9/30/2019	09-2019	2019-Q3	150,000
RSVE-02	9/30/2019	09-2019	2019-Q3	129,000
RSVE-03	9/30/2019	09-2019	2019-Q3	40,130
RSVE-04	9/30/2019	09-2019	2019-Q3	31,400
RSVE-05	9/30/2019	09-2019	2019-Q3	30,100
RSVE-06	9/30/2019	09-2019	2019-Q3	3,645
RSVE-07	9/30/2019	09-2019	2019-Q3	2,980
RSVE-08	9/30/2019	09-2019	2019-Q3	59,700
RSVE-09	9/30/2019	09-2019	2019-Q3	309
RSVE-10	9/30/2019	09-2019	2019-Q3	3,655
RSVE-01	11/20/2019	11-2019	2019-Q4	118,000
RSVE-02	11/20/2019	11-2019	2019-Q4	1,660
RSVE-03	11/20/2019	11-2019	2019-Q4	170,000
RSVE-04	11/20/2019	11-2019	2019-Q4	21,400

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-05	11/20/2019	11-2019	2019-Q4	360,000
RSVE-06	11/20/2019	11-2019	2019-Q4	5,842
RSVE-07	11/20/2019	11-2019	2019-Q4	2,925
RSVE-08	11/20/2019	11-2019	2019-Q4	39,550
RSVE-09	11/20/2019	11-2019	2019-Q4	155
RSVE-10	11/20/2019	11-2019	2019-Q4	4,235
RSVE-01	3/25/2020	03-2020	2020-Q1	27,000
RSVE-02	3/25/2020	03-2020	2020-Q1	1,905
RSVE-03	3/25/2020	03-2020	2020-Q1	30,550
RSVE-04	3/25/2020	03-2020	2020-Q1	61,180
RSVE-05	3/25/2020	03-2020	2020-Q1	370,000
RSVE-06	3/25/2020	03-2020	2020-Q1	119
RSVE-07	3/25/2020	03-2020	2020-Q1	8,900
RSVE-08	3/25/2020	03-2020	2020-Q1	13,200
RSVE-09	3/25/2020	03-2020	2020-Q1	190
RSVE-10	3/25/2020	03-2020	2020-Q1	5,610
RSVE-01	6/17/2020	06-2020	2020-Q2	30,200
RSVE-02	6/17/2020	06-2020	2020-Q2	980
RSVE-03	6/17/2020	06-2020	2020-Q2	592,500
RSVE-04	6/17/2020	06-2020	2020-Q2	283,000
RSVE-05	6/17/2020	06-2020	2020-Q2	209,000
RSVE-06	6/17/2020	06-2020	2020-Q2	5,505
RSVE-07	6/17/2020	06-2020	2020-Q2	5,090
RSVE-08	6/17/2020	06-2020	2020-Q2	52,300
RSVE-09	6/17/2020	06-2020	2020-Q2	110
RSVE-10	6/17/2020	06-2020	2020-Q2	830
RSVE-01	9/14/2020	09-2020	2020-Q3	53,250
RSVE-02	9/14/2020	09-2020	2020-Q3	305
RSVE-03	9/14/2020	09-2020	2020-Q3	562,500
RSVE-04	9/14/2020	09-2020	2020-Q3	124,000
RSVE-05	9/14/2020	09-2020	2020-Q3	240,000
RSVE-06	9/14/2020	09-2020	2020-Q3	1,220
RSVE-07	9/14/2020	09-2020	2020-Q3	2,105
RSVE-08	9/14/2020	09-2020	2020-Q3	51,580
RSVE-09	9/14/2020	09-2020	2020-Q3	189
RSVE-10	9/14/2020	09-2020	2020-Q3	2,275
RSVE-01	10/28/2020	10-2020	2020-Q4	8,425
RSVE-02	10/28/2020	10-2020	2020-Q4	1,640
RSVE-03	10/28/2020	10-2020	2020-Q4	245,000
RSVE-04	10/28/2020	10-2020	2020-Q4	104,000
RSVE-05	10/28/2020	10-2020	2020-Q4	375,000
RSVE-06	10/28/2020	10-2020	2020-Q4	275
RSVE-07	10/28/2020	10-2020	2020-Q4	3,857
RSVE-08	10/28/2020	10-2020	2020-Q4	51,300
RSVE-09	10/28/2020	10-2020	2020-Q4	442
RSVE-10	10/28/2020	10-2020	2020-Q4	50,350
RSVE-01	3/24/2021	03-2021	2021-Q1	465
RSVE-02	3/24/2021	03-2021	2021-Q1	7,030
RSVE-03	3/24/2021	03-2021	2021-Q1	302,500

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-04	3/24/2021	03-2021	2021-Q1	195,000
RSVE-05	3/24/2021	03-2021	2021-Q1	62,150
RSVE-06	3/24/2021	03-2021	2021-Q1	155
RSVE-07	3/24/2021	03-2021	2021-Q1	8,920
RSVE-08	3/24/2021	03-2021	2021-Q1	5,640
RSVE-09	3/24/2021	03-2021	2021-Q1	33
RSVE-10	3/24/2021	03-2021	2021-Q1	544
RSVE-01	4/27/2021	04-2021	2021-Q2	39,600
RSVE-04	4/27/2021	04-2021	2021-Q2	91,500
RSVE-10	4/27/2021	04-2021	2021-Q2	754
RSVE-01	6/16/2021	06-2021	2021-Q2	105,000
RSVE-02	6/16/2021	06-2021	2021-Q2	185
RSVE-03	6/16/2021	06-2021	2021-Q2	378,000
RSVE-04	6/16/2021	06-2021	2021-Q2	58,450
RSVE-05	6/16/2021	06-2021	2021-Q2	208,000
RSVE-06	6/16/2021	06-2021	2021-Q2	784
RSVE-07	6/16/2021	06-2021	2021-Q2	7,430
RSVE-08	6/16/2021	06-2021	2021-Q2	61,900
RSVE-09	6/16/2021	06-2021	2021-Q2	245
RSVE-10	6/16/2021	06-2021	2021-Q2	3,073
RSVE-01	9/28/2021	09-2021	2021-Q3	45,500
RSVE-02	9/28/2021	09-2021	2021-Q3	1,350
RSVE-03	9/28/2021	09-2021	2021-Q3	507,500
RSVE-04	9/28/2021	09-2021	2021-Q3	50,880
RSVE-05	9/28/2021	09-2021	2021-Q3	122,000
RSVE-06	9/28/2021	09-2021	2021-Q3	305
RSVE-07	9/28/2021	09-2021	2021-Q3	13,500
RSVE-08	9/28/2021	09-2021	2021-Q3	92,850
RSVE-09	9/28/2021	09-2021	2021-Q3	198
RSVE-10	9/28/2021	09-2021	2021-Q3	6,804
RSVE-01	12/21/2021	12-2021	2021-Q4	33,560
RSVE-02	12/21/2021	12-2021	2021-Q4	1,330
RSVE-03	12/21/2021	12-2021	2021-Q4	312,500
RSVE-04	12/21/2021	12-2021	2021-Q4	24,100
RSVE-05	12/21/2021	12-2021	2021-Q4	162,000
RSVE-06	12/21/2021	12-2021	2021-Q4	1,215
RSVE-07	12/21/2021	12-2021	2021-Q4	2,906
RSVE-08	12/21/2021	12-2021	2021-Q4	55,300
RSVE-09	12/21/2021	12-2021	2021-Q4	49
RSVE-10	12/21/2021	12-2021	2021-Q4	1,955
RSVE-01	4/27/2022	04-2022	2022-Q2	37,500
RSVE-02	4/27/2022	04-2022	2022-Q2	765
RSVE-03	4/27/2022	04-2022	2022-Q2	415,000
RSVE-04	4/27/2022	04-2022	2022-Q2	159,000
RSVE-05	4/27/2022	04-2022	2022-Q2	25,500
RSVE-06	4/27/2022	04-2022	2022-Q2	54
RSVE-07	4/27/2022	04-2022	2022-Q2	3,780
RSVE-08	4/27/2022	04-2022	2022-Q2	38,400
RSVE-09	4/27/2022	04-2022	2022-Q2	223

TABLE B-1
WPBL SVE System FID Readings (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

WPBL RSVE Well	Date	Month-Year	Year-Quarter	FID Concentration (ppmV)
RSVE-10	4/27/2022	04-2022	2022-Q2	1,027
RSVE-02	6/21/2022	06-2022	2022-Q2	499
RSVE-03	6/21/2022	06-2022	2022-Q2	245,000
RSVE-04	6/21/2022	06-2022	2022-Q2	17,500
RSVE-05	6/21/2022	06-2022	2022-Q2	148,000
RSVE-06	6/21/2022	06-2022	2022-Q2	955
RSVE-08	6/21/2022	06-2022	2022-Q2	38,600
RSVE-09	6/21/2022	06-2022	2022-Q2	188
RSVE-10	6/21/2022	06-2022	2022-Q2	2,120
RSVE-02	8/22/2022	08-2022	2022-Q3	2,164
RSVE-03	8/22/2022	08-2022	2022-Q3	370,000
RSVE-04	8/22/2022	08-2022	2022-Q3	42,330
RSVE-05	8/22/2022	08-2022	2022-Q3	225,000
RSVE-06	8/22/2022	08-2022	2022-Q3	164
RSVE-08	8/22/2022	08-2022	2022-Q3	30,500
RSVE-09	8/22/2022	08-2022	2022-Q3	316
RSVE-10	8/22/2022	08-2022	2022-Q3	32,220
RSVE-02	10/31/2022	10-2022	2022-Q4	4,450
RSVE-03	10/31/2022	10-2022	2022-Q4	462,500
RSVE-04	10/31/2022	10-2022	2022-Q4	36,210
RSVE-05	10/31/2022	10-2022	2022-Q4	188,000
RSVE-06	10/31/2022	10-2022	2022-Q4	855
RSVE-08	10/31/2022	10-2022	2022-Q4	40,590
RSVE-09	10/31/2022	10-2022	2022-Q4	335
RSVE-10	10/31/2022	10-2022	2022-Q4	25,700
RSVE-01	3/27/2023	03-2023	2023-Q1	3
RSVE-02	3/27/2023	03-2023	2023-Q1	16,150
RSVE-03	3/27/2023	03-2023	2023-Q1	27
RSVE-04	3/27/2023	03-2023	2023-Q1	503
RSVE-05	3/27/2023	03-2023	2023-Q1	405,000
RSVE-06	3/27/2023	03-2023	2023-Q1	5
RSVE-07	3/27/2023	03-2023	2023-Q1	14
RSVE-08	3/27/2023	03-2023	2023-Q1	3,740
RSVE-09	3/27/2023	03-2023	2023-Q1	2
RSVE-10	3/27/2023	03-2023	2023-Q1	66
RSVE-01	12/19/2023	12-2023	2023-Q4	340
RSVE-02	12/19/2023	12-2023	2023-Q4	11,680
RSVE-03	12/19/2023	12-2023	2023-Q4	375,000
RSVE-04	12/19/2023	12-2023	2023-Q4	10,500
RSVE-05	12/19/2023	12-2023	2023-Q4	194,000
RSVE-06	12/19/2023	12-2023	2023-Q4	420
RSVE-07	12/19/2023	12-2023	2023-Q4	3,525
RSVE-08	12/19/2023	12-2023	2023-Q4	75,680
RSVE-09	12/19/2023	12-2023	2023-Q4	298
RSVE-10	12/19/2023	12-2023	2023-Q4	702

Appendix C SVE Area of Influence Backup

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	09-2006 2006-Q3 in(H2O)	10-2006 2006-Q4 in(H2O)	11-2006 2006-Q4 in(H2O)	12-2006 2006-Q4 in(H2O)	01-2007 2007-Q1 in(H2O)	02-2007 2007-Q1 in(H2O)	03-2007 2007-Q1 in(H2O)
RMP-05B	50	46	92%	-0.66	-2.06	-0.81	-0.86	-1.53	-3.82	-1.32
RMP-06B	45	43	96%	-1.59	-4.61	-1.87	-1.19	-2.13		-1.10
RMP-07B	51	51	100%	-1.63	-3.85	-1.95	-1.82	-2.62	-5.88	-1.48
RMP-08B	35	34	97%	-2.67	-5.50	-3.07	-2.99	-3.66	-3.25	
RMP-09B	51	41	80%	-0.31	-0.59	-0.20	-0.20	-0.28	-0.51	-0.31
RMP-10B	51	46	90%	-0.30	-0.64	-0.25	-0.26	-0.17	-0.51	-0.36
RMP-11B	49	46	94%	-0.62	-1.38	-0.63	-0.61		-1.54	-0.64
RMP-12B	42	32	76%	-0.51	-0.37	0.01			-0.23	-0.06
RMP-12C	24	19	79%	-1.14	-1.14	-0.40	-1.06	-0.58	-0.40	-0.41
RMP-13B	46	24	52%	0.00	-0.01		-0.01		-0.06	-0.02
RMP-14B	50	15	30%	0.12	0.80	0.16	0.39	1.19	-0.07	-0.10
RMP-15B	52	52	100%	-2.94	-5.80	-2.90	-2.53	-2.87	-2.87	-2.21
RMP-37A	13	11	85%							
RMW-01B	35	21	60%	-0.08	6.19	-0.32	-0.11		0.02	0.11
RMW-02A	52	40	77%	-0.29	-0.40	-0.16	-0.20	-0.29	-0.26	-0.14
RMW-03A	50	45	90%	-0.67	-1.26	-0.72	-0.68	-0.84	-2.03	-0.92
RMW-16A	35	12	34%			-0.01	0.37	-0.04	0.42	0.47
RMW-17A	45	19	42%			-0.04	0.12	-0.03	-0.02	-0.11
RMW-24A	48	47	98%	-2.14	-4.52	-2.33	-2.03	-2.06	-4.73	-1.95
RMW-26A	47	45	96%	-2.56	-5.39	-2.40	-2.16	-2.58	-2.29	-1.89
RMW-27A	47	24	51%	-0.24	-0.18		-0.64		-1.23	-1.45
RMW-28A	48	22	46%	-0.08	-0.59	-0.57	-0.39		-0.81	-0.98
RMW-30A	40	14	35%							
RMW-37A	46	13	28%	0.01	-0.01	34.4	2.62	-0.11	-0.02	0.00
RMW-42A	52	40	77%	-0.49	-1.30	-1.13	-0.85	-2.16	-1.59	-1.32
RMW-46A	49	37	76%	-0.67	-1.79	-1.22	-1.06	-2.19	-1.70	-1.35
RMW-47A	49	35	71%	-0.21	-0.33	-0.23	-0.20	-0.56	-1.57	-0.22
RMW-48A	49	42	86%	-0.32	-0.77	-0.44	-0.43	-0.58	-0.93	-0.55
RMW-49A	50	46	92%	-0.45	-1.14	-0.58	-0.50	-0.67	-1.10	-0.54
RMW-93A	35	27	77%				-0.59	-5.18	-3.09	-3.59
RMW-94A	45	38	84%				-0.92	-1.72	-1.59	-0.99
RMW-98A	48	24	50%				-0.25	-1.25	-0.63	-0.67
RVMP-01B	46	29	63%	0.04	-0.02	-0.04	0.14	-0.04	0.03	-0.05
RVMP-02C	27	13	48%	0.17	0.02	0.03	0.40		0.05	0.27
RVMP-04B	36	22	61%	-0.02	-0.04	19.5	-0.47	0.04	-0.34	-0.41
RVMP-04C	23	11	48%							
RVMP-07B	25	16	64%	-1.06	-0.02	-2.28	-2.97			-2.28
RVMP-08B	27	24	89%	-0.19	-1.15	-1.90	-0.27		-0.83	-0.64
			Count	**30**	**29**	**28**	**34**	**26**	**33**	**34**
			Average	**-0.72**	**-1.52**	**-0.94**	**-0.65**	**-1.27**	**-1.31**	**-0.80**
			Median	**-0.39**	**-0.77**	**-0.58**	**-0.49**	**-0.76**	**-0.83**	**-0.60**

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	04-2007 2007-Q2 in(H2O)	05-2007 2007-Q2 in(H2O)	06-2007 2007-Q2 in(H2O)	07-2007 2007-Q3 in(H2O)	08-2007 2007-Q3 in(H2O)	09-2007 2007-Q3 in(H2O)	10-2007 2007-Q4 in(H2O)
RMP-05B	50	46	92%	-0.61	-1.04	-1.31	-0.70	-0.82	-0.70	-0.57
RMP-06B	45	43	96%	-0.69	-1.23	-1.10	-0.78	-0.68	-0.63	-0.52
RMP-07B	51	51	100%	-1.11	-2.75	-2.56	-1.52	-1.86	-1.65	-1.32
RMP-08B	35	34	97%	-1.07	-5.27					
RMP-09B	51	41	80%	-0.26	-0.37	-0.24	-0.11	-0.09	-0.14	-0.13
RMP-10B	51	46	90%	-0.46	-0.30	-0.31	-0.27	-0.24	-0.18	-0.14
RMP-11B	49	46	94%	-0.31	-0.21	-0.39	-0.33	-0.22	-0.32	-0.32
RMP-12B	42	32	76%	0.06	-0.38		-0.21	-0.39	-0.32	-0.29
RMP-12C	24	19	79%	0.50				-0.70	-1.07	-1.23
RMP-13B	46	24	52%	-0.02	-0.04	-0.04	-0.02	0.01	0.01	-0.02
RMP-14B	50	15	30%	0.84	-0.07	-0.12	0.37	-0.18	0.38	0.19
RMP-15B	52	52	100%	-1.57	-4.64	-5.60	-2.71	-3.24	-2.89	-2.96
RMP-37A	13	11	85%							
RMW-01B	35	21	60%	2.3	0.08	-0.28	-0.18	-0.30	-0.19	-0.31
RMW-02A	52	40	77%	-0.09	-0.02	-0.17	-0.06	-0.17	-0.13	-0.14
RMW-03A	50	45	90%	-0.69	-1.21	-1.19	-0.95	-0.77	-0.63	-0.55
RMW-16A	35	12	34%	0.64	-0.02	-0.27	-0.56	-0.01	0.41	0.12
RMW-17A	45	19	42%	0.06	0.11	-0.06	-0.07	0.04	0.08	0.04
RMW-24A	48	47	98%	-1.35	-3.43	-3.55	-2.22	-2.51	-2.13	
RMW-26A	47	45	96%	-1.34	-5.19	-5.33	-2.42	-3.25	-2.74	-2.94
RMW-27A	47	24	51%	0.36	0.50	-0.77	0.47	-1.38	-0.53	-0.50
RMW-28A	48	22	46%		0.38	0.33	0.27	-0.17	0.43	0.25
RMW-30A	40	14	35%	1.85	1.04	0.90		-0.25	0.66	0.23
RMW-37A	46	13	28%		0.00	0.01	0.00	-0.02	0.01	-0.01
RMW-42A	52	40	77%	0.35	-0.22	-0.21	0.30	-0.78	0.17	0.13
RMW-46A	49	37	76%	0.08	-0.73	-0.52	0.03	-0.29	0.05	-0.14
RMW-47A	49	35	71%	-0.07	-0.31	-0.36	0.02	-0.17	-0.12	-0.11
RMW-48A	49	42	86%	-0.36	-0.19	-0.78	-0.55	-0.41	-0.33	-0.28
RMW-49A	50	46	92%	-0.36	-0.49	-0.43	-0.34	-0.33	-0.32	-0.33
RMW-93A	35	27	77%	0.11	-1.38		0.15	0.11	0.22	-0.01
RMW-94A	45	38	84%	0.11	-0.90		-0.19	-0.69	-0.09	-0.29
RMW-98A	48	24	50%	0.19	0.29	0.13	0.30	-0.46	-0.14	-0.27
RVMP-01B	46	29	63%	0.09	0.06	0.20	-0.10	-0.08	0.08	0.03
RVMP-02C	27	13	48%	0.18	-0.03	-0.20	-0.46		0.21	0.15
RVMP-04B	36	22	61%			0.05	-0.04	-0.01	0.00	
RVMP-04C	23	11	48%		-0.20				0.00	0.00
RVMP-07B	25	16	64%	-1.74			0.00	-0.05	-0.57	-0.05
RVMP-08B	27	24	89%	-0.23	-0.24	-0.28	-0.12	-0.16	-0.14	-0.16
			Count	**32**	**34**	**30**	**33**	**34**	**36**	**34**
			Average	**-0.22**	**-0.84**	**-0.82**	**-0.39**	**-0.60**	**-0.37**	**-0.37**
			Median	**-0.08**	**-0.23**	**-0.28**	**-0.12**	**-0.27**	**-0.14**	**-0.14**

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	11-2007 2007-Q4 in(H2O)	12-2007 2007-Q4 in(H2O)	01-2008 2008-Q1 in(H2O)	02-2008 2008-Q1 in(H2O)	03-2008 2008-Q1 in(H2O)	04-2008 2008-Q2 in(H2O)	05-2008 2008-Q2 in(H2O)
RMP-05B	50	46	92%	-0.43	-1.23	-1.24	-1.64	-0.81	-0.83	-0.76
RMP-06B	45	43	96%	-1.03	-1.98	-1.42		-1.82	-0.85	-0.89
RMP-07B	51	51	100%	-1.21	-2.42	-2.48	-3.07	-1.91	-1.70	-1.50
RMP-08B	35	34	97%	-3.23					-1.39	-3.56
RMP-09B	51	41	80%	-0.16	-0.21	-0.19	-0.36	-0.41	-0.24	-0.26
RMP-10B	51	46	90%	-0.17	-0.35	-0.24	-0.40	-0.39	-0.23	-0.25
RMP-11B	49	46	94%	-0.36	-0.72	-0.29	-0.89	-0.69	-0.31	-0.46
RMP-12B	42	32	76%	-0.30	-0.33	-0.10	-0.49		-0.20	-0.15
RMP-12C	24	19	79%	-0.47	-0.15	-0.46	-1.05			
RMP-13B	46	24	52%	-0.01	0.01	-0.03	0.00		0.00	0.00
RMP-14B	50	15	30%	0.29	0.43	-0.06	-0.49	0.12	0.48	-0.34
RMP-15B	52	52	100%	-3.15	-3.60	-2.55	-2.73	-2.65	-1.93	-3.69
RMP-37A	13	11	85%							
RMW-01B	35	21	60%	-0.40	0.10		6.82	1.84	7.73	
RMW-02A	52	40	77%	-0.16	-0.15	-0.05	-0.27	-0.06	-0.07	-0.12
RMW-03A	50	45	90%	-0.45	-0.59			-1.15	-0.09	-0.86
RMW-16A	35	12	34%	-0.05	-0.40	0.05	0.35	0.43	0.83	-0.30
RMW-17A	45	19	42%	-0.04	-0.07	0.00	-0.07		0.14	-0.04
RMW-24A	48	47	98%	-1.82	-2.50	-2.31		-2.17	-1.68	-2.43
RMW-26A	47	45	96%	-3.21	-3.46	-2.12		-2.83	-1.47	-2.92
RMW-27A	47	24	51%	0.14	-1.85	-0.29	-2.23	1.34	0.26	-0.90
RMW-28A	48	22	46%	0.05	-0.64	-0.02	0.28	-0.06	0.19	-0.47
RMW-30A	40	14	35%	0.17	-0.25		-0.11	0.47	0.34	-0.62
RMW-37A	46	13	28%	0.14	0.28	0.00	0.35	0.29	0.23	0.00
RMW-42A	52	40	77%	-0.22	-1.41	-0.34	0.09	-0.95	-0.10	-0.88
RMW-46A	49	37	76%	-0.70	-1.47	-0.44	0.05	-0.41	-0.24	-0.98
RMW-47A	49	35	71%	-0.10	-0.20		-0.41	-0.12	-0.10	-0.08
RMW-48A	49	42	86%	-0.27	-0.27	-0.40	-0.40	-0.81	-0.25	-0.46
RMW-49A	50	46	92%	-0.41	-0.71	-0.25		-0.30	-0.30	-0.48
RMW-93A	35	27	77%	-0.46	-2.40	-0.84		-2.00	-0.63	-1.50
RMW-94A	45	38	84%	-0.27	-1.39	-0.41		-0.48	-0.36	-1.62
RMW-98A	48	24	50%	0.12	-0.30	0.00	-0.39	-0.33	0.30	-0.44
RVMP-01B	46	29	63%	-0.06	-0.17	0.00	-0.04	0.53	0.48	-0.02
RVMP-02C	27	13	48%	0.00	-0.42					-0.03
RVMP-04B	36	22	61%	0.00	-0.01			-0.15	0.00	0.00
RVMP-04C	23	11	48%		0.16			-0.19	-2.78	-4.68
RVMP-07B	25	16	64%		-0.12					
RVMP-08B	27	24	89%	-0.14				-1.56		
			Count	**35**	**35**	**27**	**23**	**30**	**32**	**33**
			Average	**-0.52**	**-0.82**	**-0.61**	**-0.61**	**-0.57**	**-0.39**	**-0.96**
			Median	**-0.22**	**-0.35**	**-0.29**	**-0.39**	**-0.40**	**-0.22**	**-0.47**

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	06-2008 2008-Q2 in(H2O)	07-2008 2008-Q3 in(H2O)	08-2008 2008-Q3 in(H2O)	09-2008 2008-Q3 in(H2O)	10-2008 2008-Q4 in(H2O)	11-2008 2008-Q4 in(H2O)	12-2008 2008-Q4 in(H2O)
RMP-05B	50	46	92%	-0.54	-0.51	-0.51	-0.49	-0.65	-1.90	-0.77
RMP-06B	45	43	96%	-0.62	-0.55	-0.40	-0.61	-0.35	-2.00	-0.28
RMP-07B	51	51	100%	-1.18	-1.09	-1.06	-1.08	-1.03	-1.70	-0.95
RMP-08B	35	34	97%		-3.09	-2.46		-2.02	-1.34	-0.81
RMP-09B	51	41	80%	-0.17	-0.18	-0.12	-0.21	-0.12	-0.27	-0.12
RMP-10B	51	46	90%	-0.16	-0.18	-0.15	-0.19	-0.18	0.00	-0.11
RMP-11B	49	46	94%	-0.44	-0.40	-0.26	-0.47	-0.33	-0.51	-0.37
RMP-12B	42	32	76%	-0.19	-0.05	-0.09		0.09	0.08	
RMP-12C	24	19	79%			-0.34			-2.66	
RMP-13B	46	24	52%	0.00	0.00	0.00		0.00	-0.04	0.04
RMP-14B	50	15	30%	0.24	0.32	-0.11	0.67	-0.38	-0.41	0.98
RMP-15B	52	52	100%	-2.79	-2.84	-2.62	-2.55	-1.98	-3.80	-0.86
RMP-37A	13	11	85%							
RMW-01B	35	21	60%			0.12		0.00	-0.04	
RMW-02A	52	40	77%	-0.14	-0.02	0.03	-0.03	-0.06	-0.12	0.02
RMW-03A	50	45	90%	-0.61	-0.66	-0.66	-0.88	-0.60	-0.70	-0.29
RMW-16A	35	12	34%	2.22				0.11		
RMW-17A	45	19	42%	0.06	-0.03	-0.03	0.31	-0.04	-0.05	0.22
RMW-24A	48	47	98%	-1.76	-2.06	-1.95		-1.57	-1.93	-0.76
RMW-26A	47	45	96%	-2.24	-2.43	-1.80		-1.47	-1.02	-0.70
RMW-27A	47	24	51%	0.11	-0.36	-0.51	0.40	-0.94	-1.18	1.21
RMW-28A	48	22	46%	0.00	-0.22	-0.31	0.07	-0.50	-0.65	0.52
RMW-30A	40	14	35%	0.14	-0.40	-0.65	-0.03	-0.76	-0.97	1.03
RMW-37A	46	13	28%	0.00	0.00	0.00	0.35	0.02	0.21	
RMW-42A	52	40	77%	0.25	-0.34	-0.32	-0.08	-0.72	-0.98	0.61
RMW-46A	49	37	76%	-0.13	-0.44	-0.31	-0.11	-0.49	-0.79	
RMW-47A	49	35	71%	-0.06	0.00	-0.05		-0.09		0.00
RMW-48A	49	42	86%		-0.32	-0.34	-0.40	-0.37	-0.90	-0.24
RMW-49A	50	46	92%	-0.38	-0.34	-0.20	-0.37		-0.32	-0.08
RMW-93A	35	27	77%	-0.39	-0.81	-0.79	-0.60	-0.69	-1.44	-0.79
RMW-94A	45	38	84%	-0.14	-0.33	-0.32	-0.13	-0.51	-0.80	-0.36
RMW-98A	48	24	50%	0.05	-0.12	-0.18	0.35	-0.15	-0.36	0.94
RVMP-01B	46	29	63%	-0.17		-0.04	0.31	-0.04	-0.04	0.28
RVMP-02C	27	13	48%	0.45	-0.02	-0.34				
RVMP-04B	36	22	61%	-0.19	0.00	0.00		-0.27	0.00	
RVMP-04C	23	11	48%	-2.97	0.83	-0.60	-3.04	-0.23	0.00	
RVMP-07B	25	16	64%							
RVMP-08B	27	24	89%					-0.20	0.00	
			Count	**31**	**31**	**34**	**24**	**33**	**33**	**26**
			Average	**-0.38**	**-0.54**	**-0.51**	**-0.37**	**-0.50**	**-0.81**	**-0.06**
			Median	**-0.16**	**-0.33**	**-0.32**	**-0.16**	**-0.35**	**-0.65**	**-0.12**

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	01-2009 2009-Q1 in(H2O)	02-2009 2009-Q1 in(H2O)	03-2009 2009-Q1 in(H2O)	04-2009 2009-Q2 in(H2O)	05-2009 2009-Q2 in(H2O)	08-2009 2009-Q3 in(H2O)	11-2009 2009-Q4 in(H2O)
RMP-05B	50	46	92%		-1.37		-0.94	-0.26	-0.75	-0.75
RMP-06B	45	43	96%		-0.16	-1.16	-0.66	-0.32	-0.98	
RMP-07B	51	51	100%		-2.13	-2.30	-1.12	-0.61	-1.20	-1.26
RMP-08B	35	34	97%	-1.53			-0.92			
RMP-09B	51	41	80%	-0.08	-0.08	-0.14	-0.26		-0.18	-0.18
RMP-10B	51	46	90%	-0.37	-0.16	-0.48	-0.42	-0.15	-0.45	-0.23
RMP-11B	49	46	94%	-0.30	-0.17	-0.26	-0.46	-0.19	-0.51	-0.66
RMP-12B	42	32	76%			-0.34	-0.02	0.09	-0.08	2.9
RMP-12C	24	19	79%							
RMP-13B	46	24	52%		-0.01	0.01	-0.02	0.00	-0.02	
RMP-14B	50	15	30%	-0.10	0.82	0.38	-0.01	-0.39	0.10	
RMP-15B	52	52	100%	-1.42	-0.58	-1.74	-1.05	-0.15	-2.69	-3.03
RMP-37A	13	11	85%							
RMW-01B	35	21	60%	-0.46	0.02	-0.05			0.15	
RMW-02A	52	40	77%	-0.19	-0.01	-0.07	-0.14	-0.03	0.00	-0.12
RMW-03A	50	45	90%	-0.47	-0.54	-1.38	-0.73	-0.33	-0.46	-0.79
RMW-16A	35	12	34%	-0.13	1.04					
RMW-17A	45	19	42%	-0.05	0.14		0.01		0.21	0.76
RMW-24A	48	47	98%	-1.11	-1.22		-1.14	-0.27	-1.26	-1.75
RMW-26A	47	45	96%	-1.08	-0.43		-0.90	-0.07		-0.07
RMW-27A	47	24	51%	-0.50	1.49		-0.68		-0.39	0.76
RMW-28A	48	22	46%		1.12		-0.03	0.75	-0.10	0.83
RMW-30A	40	14	35%		2.83	0.00	0.18		0.03	0.48
RMW-37A	46	13	28%	-0.01		0.02	-0.02		-0.02	0.08
RMW-42A	52	40	77%	-0.83	0.29	0.11	-0.85	0.61	-0.28	-0.02
RMW-46A	49	37	76%	-0.48	0.72	0.00	-0.51	0.60	-0.21	
RMW-47A	49	35	71%	-0.39	-0.40	-1.82	-0.06	-0.04	-0.02	0.48
RMW-48A	49	42	86%	-0.21	-0.23	-0.62	-0.53	-0.16	-0.26	
RMW-49A	50	46	92%	-0.64	-0.10	-0.23	-0.35	-0.09	-0.15	-0.23
RMW-93A	35	27	77%	-0.42	1.40		-0.08	0.70		
RMW-94A	45	38	84%	-0.87	0.60		-0.49	0.21	-0.06	-1.27
RMW-98A	48	24	50%	-0.50	0.68	0.29	-0.28	-0.60	-0.07	0.47
RVMP-01B	46	29	63%	-0.01	-0.21	0.18	-0.03	-0.18	-0.11	0.60
RVMP-02C	27	13	48%							
RVMP-04B	36	22	61%		0.02	0.02		-0.12	-1.84	
RVMP-04C	23	11	48%		-0.39		-16.31			
RVMP-07B	25	16	64%						-0.31	
RVMP-08B	27	24	89%	-0.19		-0.36		-0.59	-1.05	
			Count	**25**	**30**	**23**	**29**	**25**	**30**	**21**
			Average	**-0.49**	**0.10**	**-0.43**	**-0.43**	**-0.06**	**-0.43**	**-0.28**
			Median	**-0.42**	**-0.05**	**-0.14**	**-0.42**	**-0.15**	**-0.20**	**-0.12**

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	02-2010 2010-Q1 in(H2O)	05-2010 2010-Q2 in(H2O)	08-2010 2010-Q3 in(H2O)	11-2010 2010-Q4 in(H2O)	03-2011 2011-Q1 in(H2O)	05-2011 2011-Q2 in(H2O)	08-2011 2011-Q3 in(H2O)
RMP-05B	50	46	92%	-0.33	-0.70	-0.10	-0.13	-0.30	-0.01	0.19
RMP-06B	45	43	96%	0.05			-0.04	-0.76		-0.08
RMP-07B	51	51	100%	-0.30	-0.85	-0.23	-2.47	-0.73	-0.12	-0.23
RMP-08B	35	34	97%	-1.95	-3.59	-0.01	-0.74	-1.10	-0.17	-0.31
RMP-09B	51	41	80%	-0.03	0.00	-0.01	-0.02	-0.11	0.05	-0.01
RMP-10B	51	46	90%	-0.13		-0.02	-0.02	-1.30	0.01	-0.05
RMP-11B	49	46	94%			-0.08	-0.06	-0.62	-0.07	-0.11
RMP-12B	42	32	76%	-0.03	0.00	-0.15	-0.03	-0.02	-0.33	0.67
RMP-12C	24	19	79%	-0.25	0.00					
RMP-13B	46	24	52%	0.20	0.00	-0.19	-0.01	-0.01	0.01	-0.01
RMP-14B	50	15	30%	0.12	0.00	0.69	0.13	0.24	0.43	
RMP-15B	52	52	100%	-1.57	-2.97	-0.05	-0.71	-0.85	-0.16	-0.52
RMP-37A	13	11	85%					0.12	-0.03	0.56
RMW-01B	35	21	60%	-0.29		0.57	-0.03	0.00		
RMW-02A	52	40	77%	0.01	0.00	0.00	0.00	-0.03	0.02	-0.03
RMW-03A	50	45	90%	-0.24	-3.40	-0.14	-0.12	-0.23	0.08	-0.05
RMW-16A	35	12	34%	1.40			0.33		4.89	
RMW-17A	45	19	42%	0.09	0.05	0.00	0.00		-0.01	-0.02
RMW-24A	48	47	98%	-0.42	-0.83	-0.18	-0.29	-0.60	-0.03	-0.21
RMW-26A	47	45	96%	-1.67	-0.83	-1.27	-0.19	-0.45		0.00
RMW-27A	47	24	51%		0.80	0.62	0.27	0.71	0.54	0.58
RMW-28A	48	22	46%	-0.32	0.55	-0.02	-0.10	0.86	0.00	0.45
RMW-30A	40	14	35%		1.82	-0.12	-0.07	1.69	0.67	0.39
RMW-37A	46	13	28%	-1.07	0.00	0.00	0.00	0.00	-0.01	
RMW-42A	52	40	77%	-0.47	-0.38	0.45	-0.07	0.21	-0.12	-0.31
RMW-46A	49	37	76%	-1.81	-0.78	0.44	0.21		-0.03	0.19
RMW-47A	49	35	71%	-0.01	1.18	0.02	-0.02	-0.03	0.02	0.02
RMW-48A	49	42	86%	-0.05		-0.07	-0.04	-0.05	-0.04	-0.02
RMW-49A	50	46	92%	-0.11	0.00	-0.04	-0.06	-0.09	-0.01	-0.06
RMW-93A	35	27	77%			0.12	-0.26			-0.21
RMW-94A	45	38	84%		-0.52	0.30	-0.04	-0.22	-0.01	-0.05
RMW-98A	48	24	50%		0.00	0.30	0.29	0.36	0.28	0.17
RVMP-01B	46	29	63%		-0.03		-1.10		-0.15	
RVMP-02C	27	13	48%				0.11			
RVMP-04B	36	22	61%			-0.01	-0.08	-0.19		0.11
RVMP-04C	23	11	48%			-4.50	0.20			0.11
RVMP-07B	25	16	64%		0.46	-0.32		0.13	2.00	
RVMP-08B	27	24	89%				-0.53			-0.27
			Count	**25**	**26**	**31**	**35**	**29**	**29**	**30**
			Average	**-0.37**	**-0.39**	**-0.13**	**-0.16**	**-0.12**	**0.27**	**0.03**
			Median	**-0.24**	**0.00**	**-0.02**	**-0.04**	**-0.05**	**-0.01**	**-0.02**

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	11-2011 2011-Q4 in(H2O)	02-2012 2012-Q1 in(H2O)	05-2012 2012-Q2 in(H2O)	08-2012 2012-Q3 in(H2O)	11-2012 2012-Q4 in(H2O)	10-2013 2013-Q4 in(H2O)	10-2014 2014-Q4 in(H2O)
RMP-05B	50	46	92%	-0.15	-0.28	-0.12	-0.11	-0.13	-0.06	-0.16
RMP-06B	45	43	96%	-0.25	-0.44	-0.10	-0.11	-0.17	-0.11	-0.48
RMP-07B	51	51	100%	-0.28	-0.53	-0.20	-0.25	-0.57	-0.10	-1.23
RMP-08B	35	34	97%	-0.62	-0.81	-0.69	-0.31	-0.71	-0.45	-1.15
RMP-09B	51	41	80%	-0.02	0.00	-0.02	0.00	0.00	0.01	0.03
RMP-10B	51	46	90%	-0.08	-0.08	-0.08	-0.05	-0.06	-0.07	-0.02
RMP-11B	49	46	94%	-0.10	-0.19	-0.08	-0.01	-0.17	-0.10	-0.16
RMP-12B	42	32	76%	-0.10	-0.03	-0.02	-0.06	-4.3	-0.18	-0.16
RMP-12C	24	19	79%	-1.70	1.54		0.23	-4.1	-0.42	
RMP-13B	46	24	52%	-0.01	-0.12	0.02	-0.03	0.00	-0.06	-0.02
RMP-14B	50	15	30%	0.21	0.14	0.28	0.05	0.00	0.32	-0.11
RMP-15B	52	52	100%	-0.77	-0.87	-0.56	-0.53	-0.77	-0.60	-1.01
RMP-37A	13	11	85%	-0.26	-0.79	-0.37	-0.43	-2.20	-0.36	-2.01
RMW-01B	35	21	60%	0.12	-0.12	-0.05	-0.24	-0.59	-0.81	-1.25
RMW-02A	52	40	77%	-0.09	-0.08	-0.01	0.01	-0.02	-0.30	-0.02
RMW-03A	50	45	90%	-0.04	-0.07	-0.02	0.00	-0.06	-0.05	-0.08
RMW-16A	35	12	34%	-0.02		0.45	0.03	0.09	0.23	-0.15
RMW-17A	45	19	42%	-0.01		0.03	0.00	0.00	1.56	-0.03
RMW-24A	48	47	98%	-0.36	-0.40	-0.16	-0.42	-0.65	-0.31	-0.24
RMW-26A	47	45	96%	-0.56	-0.69	-0.57	-0.26	-0.53	-0.72	-0.93
RMW-27A	47	24	51%	0.42	-0.17	0.57	0.03	-0.60	0.07	-2.30
RMW-28A	48	22	46%	0.32	-0.35	0.52	0.14	0.00	0.08	-0.50
RMW-30A	40	14	35%	0.23	-0.29	0.57	-0.01	0.00	0.22	-0.36
RMW-37A	46	13	28%	0.00	-0.01	0.02	0.03	0.00	-0.05	-0.19
RMW-42A	52	40	77%	-0.18	-0.61	-0.33	-0.26	-1.55	-0.16	-1.37
RMW-46A	49	37	76%	-0.01	-0.40	-0.33	0.09	-0.32	-0.15	-0.32
RMW-47A	49	35	71%	0.03	0.02	-0.01	0.00	-0.10	-1.70	-0.06
RMW-48A	49	42	86%	0.01	-0.02	0.01	0.00	0.00	-0.01	-0.02
RMW-49A	50	46	92%	-0.10	-0.04	-0.06	-0.04	-0.06	-0.30	-0.05
RMW-93A	35	27	77%			-0.09	-1.18			
RMW-94A	45	38	84%	-0.28	-0.73	-0.27	-0.38	-1.47	-0.18	-0.73
RMW-98A	48	24	50%	0.18	-0.12	0.19	0.02	-0.07	-0.05	-0.40
RVMP-01B	46	29	63%	-0.02		-0.05	-0.04	-0.16	0.32	-0.24
RVMP-02C	27	13	48%	-0.42		0.21	-0.02	-0.16	-1.68	
RVMP-04B	36	22	61%	-0.01		-0.08	-0.05		-0.40	-0.03
RVMP-04C	23	11	48%	0.15	0.84				-2.69	0.61
RVMP-07B	25	16	64%		1.60	-0.50	-0.28	0.00	-0.70	1.85
RVMP-08B	27	24	89%	-0.14			-0.96			
			Count	**36**	**31**	**35**	**37**	**32**	**36**	**34**
			Average	**-0.14**	**-0.13**	**-0.05**	**-0.15**	**-0.34**	**-0.28**	**-0.39**
			Median	**-0.06**	**-0.12**	**-0.05**	**-0.04**	**-0.12**	**-0.13**	**-0.18**

TABLE C-1
WPBL Well Vacuum Readings (2006 - 2017)

Premcor Main Facility/Hartford, Illinois

WPB Area Location	Total Readings	Vacuum Measurements	Percent Vacuum Measurements	10-2015 2015-Q4 in(H2O)	10-2016 2016-Q4 in(H2O)	10-2017 2017-Q4 in(H2O)
RMP-05B	50	46	92%	0.00	0.00	0.00
RMP-06B	45	43	96%	0.00	-0.05	-0.04
RMP-07B	51	51	100%	-0.07	-0.88	-0.06
RMP-08B	35	34	97%	-0.33	-0.24	0.09
RMP-09B	51	41	80%	0.00	0.00	0.00
RMP-10B	51	46	90%	0.00	0.00	0.00
RMP-11B	49	46	94%	0.00	0.00	0.00
RMP-12B	42	32	76%	0.00	0.00	0.00
RMP-12C	24	19	79%	0.45		
RMP-13B	46	24	52%	0.00	0.00	0.00
RMP-14B	50	15	30%	0.09	0.30	0.23
RMP-15B	52	52	100%	-0.45	-0.32	-0.03
RMP-37A	13	11	85%	-0.12	-0.86	-0.14
RMW-01B	35	21	60%	-0.21	0.08	0.05
RMW-02A	52	40	77%	0.00	0.00	0.00
RMW-03A	50	45	90%	0.00	0.00	0.00
RMW-16A	35	12	34%	0.15	0.00	0.00
RMW-17A	45	19	42%	0.00	0.08	0.00
RMW-24A	48	47	98%	-0.10	0.00	-0.02
RMW-26A	47	45	96%	-0.26	-0.18	0.00
RMW-27A	47	24	51%	0.66	-0.20	0.34
RMW-28A	48	22	46%	0.36	0.09	0.41
RMW-30A	40	14	35%	0.14	0.11	0.37
RMW-37A	46	13	28%	0.00	0.00	0.00
RMW-42A	52	40	77%	-0.12	-0.51	-0.19
RMW-46A	49	37	76%	0.11	-0.19	-0.12
RMW-47A	49	35	71%	0.00	0.00	0.02
RMW-48A	49	42	86%	0.00	0.00	0.20
RMW-49A	50	46	92%	0.00	0.00	0.00
RMW-93A	35	27	77%	-0.19	0.00	-0.05
RMW-94A	45	38	84%	0.00	0.00	0.00
RMW-98A	48	24	50%	0.22	0.10	-0.15
RVMP-01B	46	29	63%	0.00	-0.66	-0.12
RVMP-02C	27	13	48%	-0.69	0.10	-0.10
RVMP-04B	36	22	61%	-0.30	0.00	0.00
RVMP-04C	23	11	48%		0.00	1.57
RVMP-07B	25	16	64%	0.41	0.00	-0.11
RVMP-08B	27	24	89%	0.23		2.39
			Count	**37**	**36**	**37**
			Average	**0.00**	**-0.09**	**0.12**
			Median	**0.00**	**0.00**	**0.00**

NOTES:

Values in gray highlighted cells are outliers and not included in statistical analysis.
in(H20) = inches of water
Q = Quarter
WPB = Western Property Boundary

Appendix D Historical Gauging Data

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TABLE D-1
WPBL Gauging Data - North Olive Stratum and Main Silt (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

Well	Date	Month-Year	Year-Quarter	LNAPL Elevation (ft msl)	GW Elevation (ft msl)	Calculated GW Elevation (ft msl)	Apparent LNAPL Thickness (feet)
RMW-01B	07/06/09	07-2009	2009-Q3	407.96	404.29	407.15	3.67
RMW-02A	07/06/09	07-2009	2009-Q3		411.73	411.73	
RMW-03A	07/06/09	07-2009	2009-Q3		413.42	413.42	
RMW-37A	07/06/09	07-2009	2009-Q3		411.45	411.45	
RMW-45A	07/06/09	07-2009	2009-Q3		414.34	414.34	
RMW-47A	07/06/09	07-2009	2009-Q3		411.94	411.94	
RMW-48A	07/06/09	07-2009	2009-Q3		416.06	416.06	
RMW-49A	07/06/09	07-2009	2009-Q3		413.78	413.78	
RMW-01B	10/06/09	10-2009	2009-Q4	403.69	403.68	403.69	0.01
RMW-02A	10/05/09	10-2009	2009-Q4		411.71	411.71	
RMW-03A	10/05/09	10-2009	2009-Q4		413.65	413.65	
RMW-37A	10/05/09	10-2009	2009-Q4		406.66	406.66	
RMW-45A	10/05/09	10-2009	2009-Q4		414.33	414.33	
RMW-47A	10/05/09	10-2009	2009-Q4		411.94	411.94	
RMW-48A	10/05/09	10-2009	2009-Q4		416.12	416.12	
RMW-49A	10/05/09	10-2009	2009-Q4		413.75	413.75	
RMW-01B	01/11/10	01-2010	2010-Q1	406.86	404.95	406.44	1.91
RMW-02A	01/11/10	01-2010	2010-Q1		411.71	411.71	
RMW-03A	01/11/10	01-2010	2010-Q1		413.44	413.44	
RMW-37A	01/11/10	01-2010	2010-Q1		410.73	410.73	
RMW-45A	01/11/10	01-2010	2010-Q1		414.90	414.90	
RMW-47A	01/11/10	01-2010	2010-Q1		411.91	411.91	
RMW-48A	01/11/10	01-2010	2010-Q1		416.30	416.30	
RMW-49A	01/11/10	01-2010	2010-Q1		413.75	413.75	
RMW-01B	04/07/10	04-2010	2010-Q2	410.38	406.77	409.59	3.61
RMW-02A	04/06/10	04-2010	2010-Q2		411.73	411.73	
RMW-03A	04/06/10	04-2010	2010-Q2		413.44	413.44	
RMW-37A	04/06/10	04-2010	2010-Q2		410.45	410.45	
RMW-45A	04/06/10	04-2010	2010-Q2		414.30	414.30	
RMW-47A	04/06/10	04-2010	2010-Q2		411.68	411.68	
RMW-48A	04/06/10	04-2010	2010-Q2		416.31	416.31	
RMW-49A	04/06/10	04-2010	2010-Q2		414.15	414.15	
RMW-01B	10/04/10	10-2010	2010-Q4	409.96	405.84	409.05	4.12
RMW-02A	10/04/10	10-2010	2010-Q4		412.11	412.11	
RMW-03A	10/04/10	10-2010	2010-Q4		413.91	413.91	
RMW-37A	10/04/10	10-2010	2010-Q4		411.80	411.80	
RMW-45A	10/04/10	10-2010	2010-Q4		415.07	415.07	
RMW-47A	10/04/10	10-2010	2010-Q4		411.94	411.94	
RMW-48A	10/04/10	10-2010	2010-Q4		416.31	416.31	
RMW-49A	10/04/10	10-2010	2010-Q4		415.20	415.20	
RMW-01B	04/04/11	04-2011	2011-Q2	407.00	405.32	406.63	1.68
RMW-02A	04/04/11	04-2011	2011-Q2		412.10	412.10	
RMW-03A	04/04/11	04-2011	2011-Q2		413.20	413.20	
RMW-37A	04/04/11	04-2011	2011-Q2		409.81	409.81	
RMW-45A	04/04/11	04-2011	2011-Q2		414.27	414.27	

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TABLE D-1
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Premcor Main Facility/Hartford, Illinois

Well	Date	Month-Year	Year-Quarter	LNAPL Elevation (ft msl)	GW Elevation (ft msl)	Calculated GW Elevation (ft msl)	Apparent LNAPL Thickness (feet)
RMW-47A	04/04/11	04-2011	2011-Q2		411.92	411.92	
RMW-48A	04/04/11	04-2011	2011-Q2		416.26	416.26	
RMW-49A	04/04/11	04-2011	2011-Q2		413.75	413.75	
RMW-01B	10/03/11	10-2011	2011-Q4	407.39	404.85	406.83	2.54
RMW-02A	10/03/11	10-2011	2011-Q4		412.06	412.06	
RMW-03A	10/03/11	10-2011	2011-Q4		412.93	412.93	
RMW-37A	10/03/11	10-2011	2011-Q4		408.87	408.87	
RMW-45A	10/03/11	10-2011	2011-Q4		414.29	414.29	
RMW-47A	10/03/11	10-2011	2011-Q4		411.85	411.85	
RMW-48A	10/03/11	10-2011	2011-Q4		416.28	416.28	
RMW-49A	10/03/11	10-2011	2011-Q4		413.79	413.79	
RMW-01B	04/02/12	04-2012	2012-Q2	404.20	403.50	404.05	0.70
RMW-02A	04/02/12	04-2012	2012-Q2		412.07	412.07	
RMW-03A	04/02/12	04-2012	2012-Q2		412.93	412.93	
RMW-37A	04/02/12	04-2012	2012-Q2		407.55	407.55	
RMW-45A	04/02/12	04-2012	2012-Q2		414.25	414.25	
RMW-47A	04/02/12	04-2012	2012-Q2		411.88	411.88	
RMW-48A	04/02/12	04-2012	2012-Q2		416.28	416.28	
RMW-49A	04/02/12	04-2012	2012-Q2		413.75	413.75	
RMW-01B	10/01/12	10-2012	2012-Q4	403.61	403.55	403.60	0.06
RMW-02A	10/01/12	10-2012	2012-Q4		412.05	412.05	
RMW-03A	10/01/12	10-2012	2012-Q4		413.03	413.03	
RMW-37A	10/01/12	10-2012	2012-Q4		404.09	404.09	
RMW-45A	10/01/12	10-2012	2012-Q4		414.22	414.22	
RMW-47A	10/01/12	10-2012	2012-Q4		411.85	411.85	
RMW-48A	10/01/12	10-2012	2012-Q4		416.27	416.27	
RMW-49A	10/01/12	10-2012	2012-Q4		413.74	413.74	
RMW-01B	04/01/13	04-2013	2013-Q2	405.13	405.10	405.12	0.03
RMW-02A	04/01/13	04-2013	2013-Q2		412.05	412.05	
RMW-03A	04/01/13	04-2013	2013-Q2		413.44	413.44	
RMW-37A	04/01/13	04-2013	2013-Q2		412.00	412.00	
RMW-45A	04/01/13	04-2013	2013-Q2		414.16	414.16	
RMW-47A	04/01/13	04-2013	2013-Q2		411.83	411.83	
RMW-48A	04/01/13	04-2013	2013-Q2		416.21	416.21	
RMW-49A	04/01/13	04-2013	2013-Q2		413.75	413.75	
RMW-01B	10/01/13	10-2013	2013-Q4	403.71	403.51	403.67	0.20
RMW-02A	10/01/13	10-2013	2013-Q4		412.10	412.10	
RMW-03A	10/01/13	10-2013	2013-Q4		412.89	412.89	
RMW-37A	10/01/13	10-2013	2013-Q4		406.54	406.54	
RMW-45A	10/01/13	10-2013	2013-Q4		414.29	414.29	
RMW-47A	10/01/13	10-2013	2013-Q4		411.94	411.94	
RMW-48A	10/01/13	10-2013	2013-Q4				
RMW-49A	10/01/13	10-2013	2013-Q4		413.74	413.74	
RMW-01B	04/01/14	04-2014	2014-Q2		403.48	403.48	
RMW-02A	04/01/14	04-2014	2014-Q2		412.10	412.10	

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TABLE D-1
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Premcor Main Facility/Hartford, Illinois

Well	Date	Month-Year	Year-Quarter	LNAPL Elevation (ft msl)	GW Elevation (ft msl)	Calculated GW Elevation (ft msl)	Apparent LNAPL Thickness (feet)
RMW-03A	04/01/14	04-2014	2014-Q2		412.60	412.60	
RMW-37A	04/01/14	04-2014	2014-Q2		403.46	403.46	
RMW-45A	04/01/14	04-2014	2014-Q2		414.26	414.26	
RMW-47A	04/01/14	04-2014	2014-Q2		411.96	411.96	
RMW-48A	04/01/14	04-2014	2014-Q2		416.28	416.28	
RMW-49A	04/01/14	04-2014	2014-Q2		413.71	413.71	
RMW-01B	10/01/14	10-2014	2014-Q4	405.50	405.17	405.43	0.33
RMW-02A	10/01/14	10-2014	2014-Q4		412.09	412.09	
RMW-03A	10/01/14	10-2014	2014-Q4		413.34	413.34	
RMW-37A	10/01/14	10-2014	2014-Q4		409.08	409.08	
RMW-45A	10/01/14	10-2014	2014-Q4		414.24	414.24	
RMW-47A	10/01/14	10-2014	2014-Q4		411.91	411.91	
RMW-48A	10/01/14	10-2014	2014-Q4		416.30	416.30	
RMW-49A	10/01/14	10-2014	2014-Q4		413.71	413.71	
RMW-01B	04/01/15	04-2015	2015-Q2		403.47	403.47	
RMW-02A	04/01/15	04-2015	2015-Q2		412.06	412.06	
RMW-03A	04/01/15	04-2015	2015-Q2		413.09	413.09	
RMW-37A	04/01/15	04-2015	2015-Q2		406.38	406.38	
RMW-45A	04/01/15	04-2015	2015-Q2		414.14	414.14	
RMW-47A	04/01/15	04-2015	2015-Q2		411.82	411.82	
RMW-48A	04/01/15	04-2015	2015-Q2		416.19	416.19	
RMW-49A	04/01/15	04-2015	2015-Q2		413.69	413.69	
RMW-01B	10/01/15	10-2015	2015-Q4	404.68	403.94	404.52	0.74
RMW-02A	10/01/15	10-2015	2015-Q4		412.11	412.11	
RMW-03A	10/01/15	10-2015	2015-Q4		413.18	413.18	
RMW-37A	10/01/15	10-2015	2015-Q4		407.80	407.80	
RMW-45A	10/01/15	10-2015	2015-Q4		414.38	414.38	
RMW-47A	10/01/15	10-2015	2015-Q4		411.84	411.84	
RMW-48A	10/01/15	10-2015	2015-Q4		416.21	416.21	
RMW-49A	10/01/15	10-2015	2015-Q4		413.76	413.76	
RMW-01B	04/05/16	04-2016	2016-Q2	406.76	406.23	406.64	0.53
RMW-02A	04/05/16	04-2016	2016-Q2		412.11	412.11	
RMW-03A	04/05/16	04-2016	2016-Q2		412.97	412.97	
RMW-37A	04/05/16	04-2016	2016-Q2		407.57	407.57	
RMW-45A	04/05/16	04-2016	2016-Q2		414.36	414.36	
RMW-47A	04/05/16	04-2016	2016-Q2		411.80	411.80	
RMW-48A	04/05/16	04-2016	2016-Q2		416.18	416.18	
RMW-49A	04/05/16	04-2016	2016-Q2				
RMW-01B	10/04/16	10-2016	2016-Q4	408.17	406.96	407.90	1.21
RMW-02A	10/04/16	10-2016	2016-Q4		412.10	412.10	
RMW-03A	10/04/16	10-2016	2016-Q4		413.82	413.82	
RMW-37A	10/04/16	10-2016	2016-Q4		410.91	410.91	
RMW-45A	10/04/16	10-2016	2016-Q4		414.43	414.43	
RMW-47A	10/04/16	10-2016	2016-Q4		411.39	411.39	
RMW-48A	10/04/16	10-2016	2016-Q4		416.23	416.23	

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TABLE D-1
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Premcor Main Facility/Hartford, Illinois

Well	Date	Month-Year	Year-Quarter	LNAPL Elevation (ft msl)	GW Elevation (ft msl)	Calculated GW Elevation (ft msl)	Apparent LNAPL Thickness (feet)
RMW-49A	10/04/16	10-2016	2016-Q4		413.81	413.81	
RMW-01B	04/04/17	04-2017	2017-Q2		406.00	406.00	
RMW-02A	04/05/17	04-2017	2017-Q2		412.17	412.17	
RMW-03A	04/04/17	04-2017	2017-Q2		413.58	413.58	
RMW-37A	04/04/17	04-2017	2017-Q2		408.94	408.94	
RMW-45A	04/04/17	04-2017	2017-Q2		414.53	414.53	
RMW-47A	04/04/17	04-2017	2017-Q2		411.48	411.48	
RMW-48A	04/04/17	04-2017	2017-Q2		416.28	416.28	
RMW-49A	04/04/17	04-2017	2017-Q2		413.75	413.75	
RMW-01B	10/17/17	10-2017	2017-Q4	405.87	405.49	405.79	0.38
RMW-02A	10/17/17	10-2017	2017-Q4		412.20	412.20	
RMW-03A	10/17/17	10-2017	2017-Q4		413.02	413.02	
RMW-37A	10/17/17	10-2017	2017-Q4		406.91	406.91	
RMW-45A	10/17/17	10-2017	2017-Q4		414.47	414.47	
RMW-47A	10/17/17	10-2017	2017-Q4		411.98	411.98	
RMW-48A	10/17/17	10-2017	2017-Q4		416.36	416.36	
RMW-49A	10/17/17	10-2017	2017-Q4		413.91	413.91	
RMW-01B	04/17/18	04-2018	2018-Q2	407.73	407.69	407.72	0.04
RMW-02A	04/17/18	04-2018	2018-Q2		412.13	412.13	
RMW-03A	04/17/18	04-2018	2018-Q2		413.75	413.75	
RMW-37A	04/17/18	04-2018	2018-Q2		410.92	410.92	
RMW-45A	04/17/18	04-2018	2018-Q2		414.52	414.52	
RMW-47A	04/17/18	04-2018	2018-Q2		411.51	411.51	
RMW-48A	04/17/18	04-2018	2018-Q2		416.30	416.30	
RMW-49A	04/17/18	04-2018	2018-Q2		413.89	413.89	
RMW-01B	10/01/18	10-2018	2018-Q4	406.20	405.97	406.15	0.23
RMW-03A	10/01/18	10-2018	2018-Q4		413.33	413.33	
RMW-37A	10/01/18	10-2018	2018-Q4		408.72	408.72	
RMW-49A	10/01/18	10-2018	2018-Q4		413.85	413.85	
RMW-01B	04/02/19	04-2019	2019-Q2		410.73	410.73	
RMW-02A	04/02/19	04-2019	2019-Q2		412.43	412.43	
RMW-03A	04/02/19	04-2019	2019-Q2		415.32	415.32	
RMW-37A	04/02/19	04-2019	2019-Q2		418.89	418.89	
RMW-45A	04/02/19	04-2019	2019-Q2		414.83	414.83	
RMW-47A	04/02/19	04-2019	2019-Q2		411.68	411.68	
RMW-48A	04/02/19	04-2019	2019-Q2		419.24	419.24	
RMW-49A	04/02/19	04-2019	2019-Q2		414.29	414.29	
RMW-01B	10/08/19	10-2019	2019-Q4	412.25	411.87	412.17	0.38
RMW-03A	10/08/19	10-2019	2019-Q4		415.79	415.79	
RMW-37A	10/08/19	10-2019	2019-Q4		412.75	412.75	
RMW-49A	10/08/19	10-2019	2019-Q4		416.54	416.54	
RMW-01B	06/02/20	06-2020	2020-Q2	412.61	412.60	412.61	0.01
RMW-02A	06/02/20	06-2020	2020-Q2		413.12	413.12	
RMW-03A	06/02/20	06-2020	2020-Q2		416.85	416.85	
RMW-37A	06/02/20	06-2020	2020-Q2		415.89	415.89	

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Premcor Main Facility/Hartford, Illinois

Well	Date	Month-Year	Year-Quarter	LNAPL Elevation (ft msl)	GW Elevation (ft msl)	Calculated GW Elevation (ft msl)	Apparent LNAPL Thickness (feet)
RMW-45A	06/02/20	06-2020	2020-Q2		417.49	417.49	
RMW-47A	06/02/20	06-2020	2020-Q2		413.65	413.65	
RMW-48A	06/02/20	06-2020	2020-Q2		416.31	416.31	
RMW-49A	06/02/20	06-2020	2020-Q2		417.22	417.22	
RMW-01B	10/12/20	10-2020	2020-Q4	405.93	405.47	405.83	0.46
RMW-03A	10/12/20	10-2020	2020-Q4		413.26	413.26	
RMW-37A	10/12/20	10-2020	2020-Q4		408.64	408.64	
RMW-49A	10/12/20	10-2020	2020-Q4		414.40	414.40	
RMW-01B	04/06/21	04-2021	2021-Q2	408.33	408.28	408.32	0.05
RMW-02A	04/06/21	04-2021	2021-Q2		412.21	412.21	
RMW-03A	04/06/21	04-2021	2021-Q2		414.08	414.08	
RMW-37A	04/06/21	04-2021	2021-Q2		412.81	412.81	
RMW-45A	04/06/21	04-2021	2021-Q2		415.10	415.10	
RMW-47A	04/06/21	04-2021	2021-Q2		411.93	411.93	
RMW-48A	04/06/21	04-2021	2021-Q2		416.34	416.34	
RMW-49A	04/06/21	04-2021	2021-Q2		413.97	413.97	
RMW-01B	10/25/21	10-2021	2021-Q4	405.17	404.87	405.10	0.30
RMW-03A	10/25/21	10-2021	2021-Q4		413.29	413.29	
RMW-37A	10/25/21	10-2021	2021-Q4		407.96	407.96	
RMW-49A	10/25/21	10-2021	2021-Q4		413.89	413.89	
RMW-01B	04/05/22	04-2022	2022-Q2		407.77	407.77	
RMW-02A	04/05/22	04-2022	2022-Q2		412.15	412.15	
RMW-03A	04/05/22	04-2022	2022-Q2		414.13	414.13	
RMW-37A	04/05/22	04-2022	2022-Q2		415.63	415.63	
RMW-45A	04/05/22	04-2022	2022-Q2		414.54	414.54	
RMW-47A	04/05/22	04-2022	2022-Q2		411.92	411.92	
RMW-48A	04/05/22	04-2022	2022-Q2		416.33	416.33	
RMW-49A	04/05/22	04-2022	2022-Q2		413.99	413.99	
RMW-01B	11/15/22	11-2022	2022-Q4				
RMW-03A	11/15/22	11-2022	2022-Q4		413.26	413.26	
RMW-37A	11/15/22	11-2022	2022-Q4		406.51	406.51	
RMW-49A	11/15/22	11-2022	2022-Q4		413.89	413.89	
RMW-01B	12/01/22	12-2022	2022-Q4		403.62	403.62	
RMW-03A	12/01/22	12-2022	2022-Q4		412.30	412.30	
RMW-37A	12/01/22	12-2022	2022-Q4		405.75	405.75	
RMW-49A	12/01/22	12-2022	2022-Q4		413.92	413.92	
RMW-01B	12/16/22	12-2022	2022-Q4		406.25	406.25	
RMW-03A	12/16/22	12-2022	2022-Q4		412.62	412.62	
RMW-37A	12/16/22	12-2022	2022-Q4		406.28	406.28	
RMW-49A	12/16/22	12-2022	2022-Q4		413.95	413.95	
RMW-01B	04/11/23	04-2023	2023-Q2		404.76	404.76	
RMW-02A	04/11/23	04-2023	2023-Q2		412.14	412.14	
RMW-03A	04/11/23	04-2023	2023-Q2		413.30	413.30	
RMW-37A	04/11/23	04-2023	2023-Q2		408.75	408.75	
RMW-45A	04/11/23	04-2023	2023-Q2		414.56	414.56	

TABLE D-1
WPBL Gauging Data - North Olive Stratum and Main Silt (2006 - 2023)

Premcor Main Facility/Hartford, Illinois

Well	Date	Month-Year	Year-Quarter	LNAPL Elevation (ft msl)	GW Elevation (ft msl)	Calculated GW Elevation (ft msl)	Apparent LNAPL Thickness (feet)
RMW-47A	04/11/23	04-2023	2023-Q2		411.92	411.92	
RMW-48A	04/11/23	04-2023	2023-Q2		416.32	416.32	
RMW-49A	04/11/23	04-2023	2023-Q2		413.89	413.89	
RMW-01B	10/02/23	10-2023	2023-Q4		403.57	403.57	
RMW-03A	10/02/23	10-2023	2023-Q4		413.24	413.24	
RMW-37A	10/02/23	10-2023	2023-Q4		404.35	404.35	
RMW-49A	10/03/23	10-2023	2023-Q4		413.75	413.75	

NOTES:

ft msl = feet above mean sea level
GW = Groundwater
LNAPL = Light Non-Aqueous Phase Liquid

Appendix E Historical Groundwater Concentrations

TABLE E-1
Dissolved-Phase Organic Compound Exceedances - North Olive Stratum and Main Silt (2014 - 2023)

Premcor Main Facility/Hartford, Illinois

Well	Sample Date	Constituent	TACO Groundwater Remediation Objectives (GROs)										Result[1]	Unit
			I/C GW Table H	I/C GW Table H Exceedance Flag	I/C GW Table I	I/C GW Table I Exceedance Flag	Res GW Table H	Res GW Table H Exceedance Flag	Res GW Table I	Res GW Table I Exceedance Flag	Class I GW	Class I GW Exceedance Flag		
VOCs:														
RMW-01B	4/10/2017	Benzene	410		2600		110	x	**410**		**5**	x	**328**	ug/l
RMW-01B	4/14/2022	Benzene	410		2600		110	x	**410**		**5**	x	**224**	ug/l
RMW-41A	6/9/2020	Benzene	410		2600		110		410		**5**	x	**35.1**	ug/l
RMW-47A	6/10/2020	Benzene	410		2600		110		410		**5**	x	**109**	ug/l
RMW-47A	6/10/2020	Ethylbenzene	1400		8100		370	x	**1300**		**700**		**373**	ug/l
SVOCs:														
RMW-01B	4/10/2017	Benzo(a)anthracene									**0.00013**	x	**0.00108**	mg/l
RMW-01B	4/10/2017	Benzo(a)pyrene									**0.0002**	x	**0.00143**	mg/l
RMW-01B	4/10/2017	Benzo(b)fluoranthene									**0.00018**	x	**0.00235**	mg/l
RMW-01B	4/10/2017	Benzo(k)fluoranthene									**0.00017**	x	**0.00123**	mg/l
RMW-01B	4/10/2017	Bis(2-ethylhexyl) phthalate									**0.006**	x	**0.187**	mg/l
RMW-01B	4/10/2017	Chrysene									**0.0015**	x	**0.00199**	mg/l
RMW-01B	4/10/2017	Dibenzo(a,h)anthracene									**0.0003**	x	**0.000615**	mg/l
RMW-01B	4/10/2017	Indeno(1,2,3-cd)pyrene									**0.00043**	x	**0.00162**	mg/l
RMW-01B	4/10/2017	Naphthalene	0.32		13		0.075	x	**1.8**		**0.14**		**0.103**	mg/l
RMW-01B	4/14/2022	Benzo(a)anthracene									**0.00013**	x	**0.00616**	mg/l
RMW-01B	4/14/2022	Benzo(a)pyrene									**0.0002**	x	**0.008**	mg/l
RMW-01B	4/14/2022	Benzo(b)fluoranthene									**0.00018**	x	**0.0114**	mg/l
RMW-01B	4/14/2022	Benzo(k)fluoranthene									**0.00017**	x	**0.0045**	mg/l
RMW-01B	4/14/2022	Bis(2-ethylhexyl) phthalate									**0.006**	x	**0.426**	mg/l
RMW-01B	4/14/2022	Chrysene									**0.0015**	x	**0.0116**	mg/l
RMW-01B	4/14/2022	Indeno(1,2,3-cd)pyrene									**0.00043**	x	**0.0085**	mg/l
RMW-45A	4/4/2019	Bis(2-ethylhexyl) phthalate									**0.006**	x	**0.011**	mg/l
RMW-47A	6/10/2020	Naphthalene	0.32		13		0.075	x	**1.8**		**0.14**	x	**0.289**	mg/l

NOTES:

(1) = Concentration is above the laboratory detection limit.
GW = Groundwater
I/C = Industrial/Commercial
mg/l = milligrams per liter
Res = Residential
TACO = Tiered Approach to Corrective Action Objectives (35 IAC, Part 742)
ug/ = micrograms per liter

SR000821

Illinois Environmental Protection Agency
2520 West Iles Avenue • P.O. Box 19276 • Springfield, Illinois • 62794-9276 • 217-782-3397

JB Pritzker, Governor **James Jennings**, Acting Director

217/524-3301

CERTIFIED MAIL
RETURN RECEIPT REQUESTED
9589 0710 5270 2887 2253 37

FEB 23 2026

The Premcor Refining Group, Inc.
Attention: Mr. Thomas Mroz
One Valero Way
San Antonio, Texas 87249-1112

Re: 1190500002 -- Madison County
The Premcor Refining Group, Inc.
ILD041889023
RCRA Log No. CO-2-CA-21
RCRA Permit – 24A
Permit CA

Dear Mr. Mroz:

This letter is in response to the following submittal submitted by J. Michael Hawthrone, P.G. and Camille Carter, GEI Consultants, Inc. on behalf of the Premcor Refining Group, Inc. (Premcor) to meet the requirements of the Consent Order between Premcor and the State of Illinois (Document No. 03-CH-459, finalized on July 26, 2018) (Consent Order):

1. Corrective Measures Completion Report for the Soil Vapor Extraction System, dated April 10, 2025, and received by the Illinois EPA on April 14, 2025. The report was assigned a Log No. of CO-2-CA-21.

The subject submittal requests Illinois EPA approval for the transition from operating the Soil Vapor Extraction (SVE) System to Monitored Natural Source Zone Depletion (MNSZD) and Monitored Natural Attenuation (MNA) along the Western Property Boundary Line (WPBL) in accordance with the Strategic, Tactical, and Operational Plan for Site-Wide Investigation / Remediation Work (Strategic Plan, GEI 2018).

The Illinois EPA has reviewed the subject submittal and has determined that it cannot be approved at this time for the following reasons:

1. The Strategic Plan requires that the effectiveness of MNA and MNSZD versus bioventing and/or SVE will be reviewed every five (5) years and documented in a 5-year evaluation

report. It further states that if MNA and MNSZD are more effective than bioventing and/or SVE, a request to cease operation of the bioventing and/or SVE will be submitted in a Corrective Measures Completion Report (CMCR) for Illinois EPA review and approval. Due to the large data gap (time reviewed is only one year within the WPBL and only two years site wide instead of a full five years) between the requirements of the Strategic Plan and the data presented to evaluate the effectiveness of MNSZD in the subject submittal, the Illinois EPA has determined that submission of the CMCR is premature and cannot be approved at this time.

2. The presentation of data included in the subject submittal and the referenced Annual Progress Reports is not technically adequate to support an evaluation of the effectiveness of MNSZD. All data and calculations used in the evaluation of the effectiveness of MNSZD should be included in the CMCR. Sufficient calculations to demonstrate achievement of the conclusions proposed by the facility must be included in the CMCR. A complete narrative description of the process employed to produce conclusions must also be included in the CMCR.

3. The information provided in support of the Degassing Method is insufficient for the Illinois EPA to determine if this method was applied appropriately at the facility. An adequate description of the method is provided in the MNSZD Work Plan, but a proposal to use the Degassing Method should include a narrative description of how the method is applied, input values and how they were determined, calculations demonstrating how conclusions are reached, and relevant data.

4. It appears the single estimated MNSZD rate for the WPBL was not determined appropriately. In accordance with ASTM E3361-22, if there are measured natural attenuation rates from application of other methods besides the Degassing Method in the vadose zone, these rates cannot be combined.

5. The subject submittal does not provide a direct comparison of the effectiveness of SVE versus MNSZD in the WPBL, as the effectiveness of SVE was evaluated in wells screened in the North Olive and the Main Silt while the effectiveness of MNSZD was evaluated in wells screened in the North Olive, EPA Stratum/Main Sand, and the Main Sand Below the D Clay.

6. As stated in the previous letter (Log No. B-215-CA-9), the following conditions still need to be addressed:

   a) For any soil contamination above the groundwater saturated zone, the applicable chemical saturation levels (C_{sat}), soil attenuation limits, or total petroleum hydrocarbon (TPH) above the soil attenuation limits as set forth in 35 IAC Part 742 (Tiered Approaches to Corrective Action- TACO) are considered the source materials and will need to be remediated below the afore-mentioned levels prior to applying TACO remedial objectives.

As noted in the Strategic Plan, the proposed MNSZD may be used where it is applicable for soil. As required in 35 IAC 742.120 and 300 (b), characterization of any soil contamination that would be considered source materials must be clearly identified in any of the areas considered to have the proposed MNSZD monitoring areas and ensure that the soil source materials are not contributing to groundwater contamination as well as all other ingestion and inhalation (outdoor and indoor) exposure routes to meet TACO remedial objectives.

b) When the proposed MNSZD is to be applied to the contaminated soils above the saturated zone for each specific area, the facility must provide a soil specific workplan to the Illinois EPA to implement the proposed MNSZD. Such workplan must include additional background conditions and proposed soil-specific plans for sampling, monitoring, and reporting. Such plan must also include the estimated: (1) amount of hydrocarbons to be remediated to reach the remedial goal; and (2) timeframe for no further action levels at each remediation area. Such plan should also include estimated degradation rates in soil when it is considered for soil contamination (i.e. differentiation from groundwater degradation). Furthermore, the workplan for media above the groundwater saturated zone must specifically address how the natural degradation in soil is monitored periodically by actual contaminated soil/soil gas sampling to eventually meet remedial objectives for the site developed in accordance with TACO.

7. It appears that the temperature versus elevation graphs (Figures 3A, 3B, etc.) for wells RSVE-01, RSVE-04, RSVE-45A, RSVE-07, RSVE-08, RSVE-09, and RSVE-10 in the 2023 Annual Progress Report, including the Fourth Quarter 2023 Quarterly Status Report, Premcor Facility Errata, (Attachment A), do not include the linear equations used to calculate the temperature gradients (dT/dz, both upward and downward). Without these equations, it is difficult to verify accurately the calculated MNSZD rates.

This action shall constitute the Illinois EPA's final action on the subject submittal. The applicant may appeal this final decision to the Illinois Pollution Control Board pursuant to Section 40 of the Illinois Environmental Protection Act by filing a petition for a hearing within thirty-five (35) days after the date of issuance of the final decision. However, the 35-day period may be extended for a period of time not to exceed 90 days by written notice from the applicant and the Illinois EPA within the initial 35-day appeal period. If the owner or operator wishes to receive a 90-day extension, a written request that includes a statement of the date the final decision was received, along with a copy of this decision, must be sent to the Illinois EPA as soon as possible. For information regarding the request for an extension, please contact:

Illinois Environmental Protection Agency
Division of Legal Counsel
2520 West Iles Avenue
Post Office Box 19276
Springfield, IL 62794-9276
217/782-5544

For information regarding the filing of an appeal, please contact:

Illinois Pollution Control Board
60 East Van Buren Street, Suite 630
Chicago, IL 60605-1241
312/814-3620

Work required by this letter, this submittal, or the regulations may also be subject to other laws governing professional services, such as the Illinois Professional Land Surveyor Act of 1989, the Professional Engineering Practice Act of 1989, the Professional Geologist Licensing Act, and the Structural Engineering Licensing Act of 1989. This letter does not relieve anyone from compliance with these laws and the regulations adopted pursuant to these laws. All work that falls within the scope and definitions of these laws must be performed in compliance with them. The Illinois EPA may refer any discovered violation of these laws to the appropriate regulating authority.

If there are any questions regarding this project related to groundwater issues, please contact Dana Austin, P.G., by phone at 217/785-7427 or by email at dana.austin@illinois.gov. For all other questions, please contact Omar Faruk, E.I.T., by phone at 217/557-9764 or by email at omar.faruk@illinois.gov.

Sincerely,

Joshua L. Rhoades, P.G.
Permit Section Manager
Bureau of Land

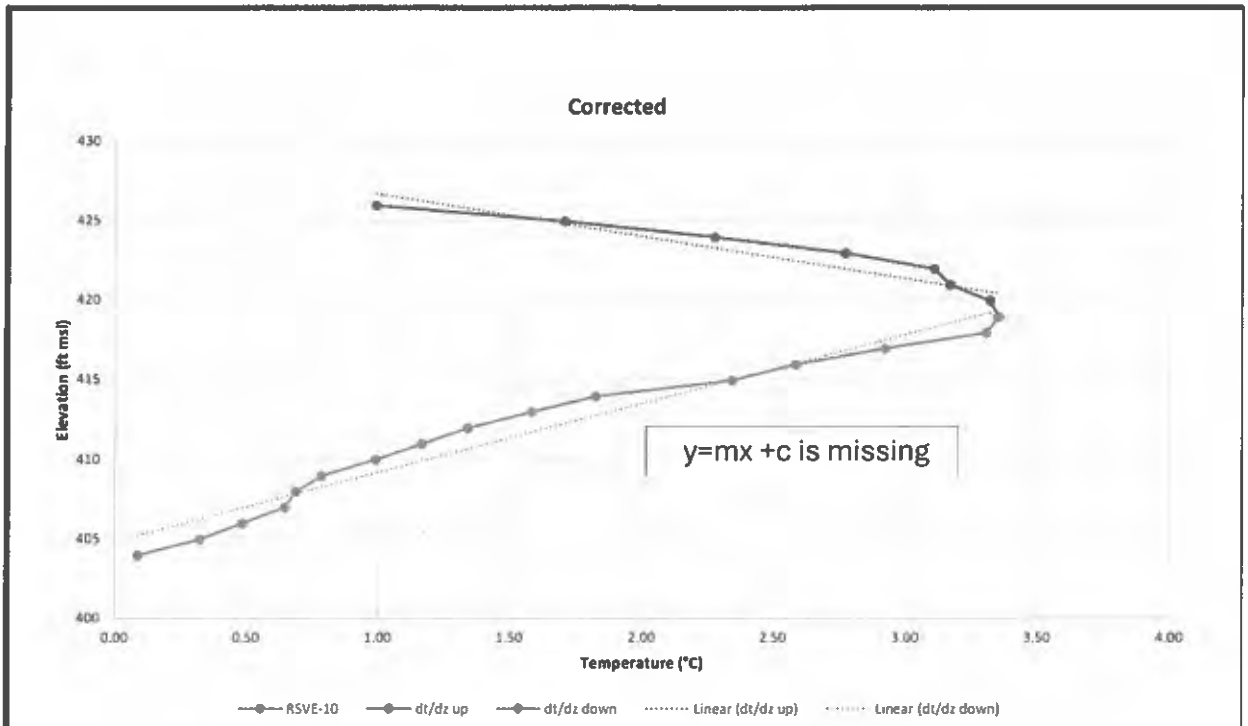
JLR:OF: 1190500002-CO-2-CA-21-Denial.docx
AMB OF TNH BMA

Attachments: A. Temperature Profile
B. Western Property Boundary Map

cc: Thomas Mroz, Premcor Refining Group
J. Michael Hawthrone, GEI Consultants (electronic copy)
Camille Carter, GEI Consultants (electronic copy)

Attachment A

Temperature Profile



NOTES:

- dt/dz = temperature gradient
- MNSZD = Monitored natural source zone depletion
- WPBL = Western Property Boundary Line

2023 MNSZD WPBL Memo Premcor Facility Hartford, Illinois		GEI Consultants	**Corrected Temperature Profile, RSVE-10**
The Premcor Refining Group Inc. Hartford, Illinois	Project 2500059	April 2025	Figure 3G

Attachment B

Western Property Boundary Map

