ILLINOIS POLLUTION CONTROL BOARD

Blake Leasing Company, LLC – Real Estate Series, as owner of Kirkland Quick Stop,	)	
Petitioner,	)	PCB No. 16-100
	)	(Water Well Setback Exception)
v.	)	
Illinois Environmental Protection Agency and Village of Kirkland,	)	
Respondents.	)	

NOTICE OF FILING

To: See Attached Certificate of Service

PLEASE TAKE NOTICE that on March 17, 2017, the Petitioner, Blake Leasing Company, LLC – Real Estate Series as owner of Kirkland Quick Stop, submits its Responses to Illinois Pollution Control Board's Questions of February 23, 2017, a copy of which are attached and served upon you.

Dated: March 17, 2017

Respectfully submitted,

On behalf of Blake Leasing Company, LLC – Real Estate Series

/s/Charles F. Helsten
Charles F. Helsten
One of Its Attorneys

Charles F. Helsten
HINSHAW & CULBERTSON LLP
100 Park Avenue
P.O. Box 1389
Rockford, IL 61105-1389
815-490-4900
chelsten@hinshawlaw.com

CERTIFICATE OF SERVICE

I, Charles F. Helsten, an attorney, certify that I have served the above Notice of Filing and attached Responses to Illinois Pollution Control Board's Questions of February 23, 2017 on the named parties below via email and by certified mail, return receipt requested, by 5:00 p.m. on March 17, 2017, by depositing the attached in the U.S. Mail at Rockford, Illinois, with proper postage or delivery charge prepaid.

Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Joanne M. Olson
Illinois Environmental Protection Agency
Division of Legal Counsel
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276
Joanne.Olson@Illinois.Gov

Brad Halloran
Hearing Officer
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601
Brad.Halloran@Illinois.Gov

Village of Kirkland
Attn: Mayor Les Bellah
511 W. Main Street
Kirkland, Illinois 60146
Mayor_bellah@mchsi.com

Don Brown
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601
Don.Brown@Illinois.Gov

Scott A. Puma
Ancel, Glink, Diamond, Bush, DiCianni & Krafthefer, P.C.
175 Hawthorn Parkway, Suite 145
Vernon Hills, IL 60061
spuma@ancelglink.com

/s/Charles F. Helsten

ILLINOIS POLLUTION CONTROL BOARD

Blake Leasing Company, LLC – Real Estate Series, as owner of Kirkland Quick Stop,	)	
Petitioner,	)	PCB No. 16-100 (Water Well Setback Exception)
v.	)	
Illinois Environmental Protection Agency and Village of Kirkland,	)	
Respondents.	)	

PETITIONER'S RESPONSES TO ILLINOIS POLLUTION CONTROL BOARD'S QUESTIONS OF FEBRUARY 23, 2017

NOW COMES Petitioner, Blake Leasing Company, LLC – Real Estate Series as owner of Kirkland Quick Stop, by and through its attorneys, Hinshaw & Culbertson, LLP, and submits its Responses to Illinois Pollution Control Board's Questions of February 23, 2017, which are attached hereto.

Dated: March 17, 2017

Respectfully submitted,

On behalf of Blake Leasing Company, LLC – Real Estate Series

/s/ Charles F. Helsten
Charles F. Helsten
One of Its Attorneys

Charles F. Helsten
HINSHAW & CULBERTSON LLP
100 Park Avenue
P.O. Box 1389
Rockford, IL 61105-1389
815-490-4900
chelsten@hinshawlaw.com

CERTIFICATE OF SERVICE

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Illinois Environmental Protection Agency
1021 North Grand Avenue East
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Brad Halloran
Hearing Officer
James R. Thompson Center
100 W. Randolph, Suite 11-500
Chicago, Illinois 60601
Brad.Halloran@Illinois.Gov

Village of Kirkland
Attn: Mayor Les Bellah
511 W. Main Street
Kirkland, Illinois 60146
Mayor_bellah@mchsi.com

Don Brown
Illinois Pollution Control Board
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, IL 60601
Don.Brown@Illinois.Gov

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Ancel, Glink, Diamond, Bush, DiCianni & Krafthefer, P.C.
175 Hawthorn Parkway, Suite 145
Vernon Hills, IL 60061
spuma@ancelglink.com

/s/Charles F. Helsten

ST. JOHN - MITTELHAUSER & ASSOCIATES

TECHNICAL MEMORANDUM

Date: March 17, 2017

From: Ron St. John, Steve Swenson; St. John – Mittelhauser & Associates, Inc.

RE: Written Responses to the Illinois Pollution Control Board Questions dated February 23, 2017 for Blake Leasing Company, LLC v. Illinois Environmental Protection Agency and Village of Kirkland; PCB 16-100 (Water Well Setback Exception).

In accordance with the Illinois Pollution Control Board (IPCB) order dated February 23, 2017, Blake Leasing is providing the following written responses to questions posed by the IPCB.

1. *The amended petition (Am. Pet.) states, "Active remediation was initially requested because it was believed that the Subject Property was located within the setback zone of the Village of Kirkland emergency backup water supply well, referred to as Well #11424, (Well #1) and the main Village supply well, referred to as Well #11425 (Well #2)." Am. Pet. at 2. It also asserts, "Testing results performed in August 2016 demonstrated and confirmed that both the area of residual contamination and the UST system owned and operated by the Petitioner are outside the minimum setback zone for Well #2, the primary Village Community Well." Am. Pet. at 3, 11. However, the Amended petition does not identify the applicable well or wells.*

   Blake must clearly state which well or wells require a water well setback exception pursuant to 415 ILCS 14.2(c).

   Response: Groundwater samples collected in August and November 2016, identified the presence of benzene and/or PNA constituents above their respective Tier 1, Class I Groundwater Remediation Objectives (GROs) in monitoring wells MW-1, MW-3A, MW-6, MW-14, and MW-15 that are located within the setback of the Emergency Backup Well #1 (11424). The groundwater sampling results for March 2017 were similar to the previous two sampling events, except that, there were no GROs exceeded in MW-14 and there were minor PNA concentrations that exceeded the GROs in MW-5 (located in more of the central portion of the site). The location of these monitoring wells is provided on Figure 1 that accompanies this Technical Memorandum. Note that Figure 1 is actually comprised of three figures related to the following sampling dates, Figure 1A (August 2016), Figure 1B (November/December 2016) and Figure 1C (March 2017). These figures will collectively be referred to as Figure 1 throughout the remainder of this Technical Memorandum unless one of the specific sampling dates is referenced.

1401 Branding Avenue, Downers Grove, IL 60515
Phone: (630) 427-8100 Fax: (630) 427-8129

The more recent groundwater sampling performed by low-flow methods over the last three sampling events (August and November 2016 and March 2017) indicate that the monitoring wells closest to the Kirkland Emergency Backup Well #1, MW-30S and MW-30D, are not impacted by PNAs above the GROs. This data indicates that the PNA sample results in excess of the GROs from prior sampling events at wells MW-30S and MW-30D were the result of analyzing turbid samples and was caused by purging well volumes with bailers during sampling. This issue of turbid groundwater samples impacting the laboratory analytical results for PNAs is discussed in greater detail in the responses to IPCB question #7, below.

2. *Should the "Technical Report", Exhibit A to the amended petition, be dated January 5, 2017 rather than 2016?*

Response: Yes, the "Technical Report", Exhibit A to the amended petition should be dated January 5, 2017.

3. *Blake Leasing states that the proposed air sparging includes the installation of 12-15 air injection stingers via 1-inch diameter monitoring wells. Am. Pet. at 10, Exh. A. Att. C. Blake states, "the Petitioner will utilize the maximum feasible alternative setback as required by this Board to encompass and address the entire KQS site." Am. Pet. at 11. In its response (IEPA Resp.) IEPA explains, "the maximum feasible setback is considered to assure that the greatest possible distance between a potential source or potential route, and a potable well is maintained. In the case of injective remedial technologies, the maximum feasible distance is necessarily as close as the contaminants of remedial concern." IEPA Resp. at 8.*

   (a) *Consistent with the IEPA's response to Blake's amended petition, Blake must submit a map displaying the proposed air sparging system. IEPA Resp. at 8, 9. The map must delineate the number, location, and depth of each planned air sparging injection point along with the location and number of all potable water supply wells. If possible, the map should also overlay the areas of highest contaminant concentration.*

   Response:

   - The number and location of the planned air sparging wells, including the identification of monitoring wells exceeding their GROs are shown on Figure 1. The location of Emergency Backup Well #1 (11424) and its minimum setback is also identified on Figure 1.

   - A conceptual construction diagram of the proposed air sparging wells, including lithology, sparge interval, and total depth is shown on Figure 2 attached to this Technical Memorandum.

   (b) *Identify any wells, in addition to Municipal Water Supply Well #2 and Emergency Backup Well # 1, which require a water well setback exception. Provide precise information about the number, location, depth, and use for these additional wells.*

Response: The only potable water well that requires a water well setback exception is Emergency Backup Well #1. The area of groundwater impact and the proposed air sparging wells are outside the 400-foot setback of Municipal Water Supply Well #2. The locations of the Emergency Backup Well #1 and the Municipal Water Supply Well #2 are shown on Figure 3 of this Technical Memorandum.

The Village of Kirkland utilizes an additional well identified as Water Supply Well #3 for the distribution of water to the community on a routine basis. Water Supply Well #3 is located approximately 1.25 miles to the west of the Village and was drilled and connected to the Kirkland water system in 2005. Water Supply Wells #2 and #3 are used by the Village of Kirkland on a rotating basis to supply all water to the Village.

Potable water well records were obtained from the Illinois State Geological Survey (ISGS) and the Illinois State Water Survey (ISWS). Based on the well records, the only potable water well(s) within 1,000 feet of the Site are the Kirkland Emergency Backup Well #1 and Water Supply Well #2. Beyond 1,000 feet from the Site, the ISGS and ISWS records indicate that the nearest potable water well is located approximately 1,130 feet east-northeast of the Site.

In addition to the ISGS and ISWS, SMA contacted the Village of Kirkland Water Department[1] to identify any potable water wells not included in the ISGS and ISWS records. SMA was informed that there are only three addresses within the Village that do not have a water meter (and are not hooked up to the Village supplied water system) and have a private well. The locations for these three homes are identified on Figure 4. The closest of these three private water wells to the site is located approximately 900 feet to the south-southeast of the KQS site. The location of this private well is hydraulically upgradient in the upper, glaciofluvial aquifer from the KQS site and approximately 615 feet outside the setback of the Kirkland Backup Well #1 (11424) and 950 feet outside the setback of Kirkland Well #2 (11425). Logs for potable water wells #2 and #3 on Figure 4 were not available in either the ISGS or ISWS records.

(c) *Submit a legible well survey and clearly identify, by number, any potable water supply wells affected by the requested exception.*

Response: As discussed in item 3(b) above, the only potable water supply well that requires an exemption is Emergency Backup Well #1. The location of Emergency Backup Well #1, the 400-foot setback zone, and the KQS Site are provided on Figure 3.

(d) *Quantify, in feet, the maximum feasible alternative setback between the injection locations and Municipal Water Supply Well #2, Emergency Backup Well # 1, and any other potable wells for which setback requirements would be affected by the requested exception.*

[1] Personal Communication with Chris DeMunn, Kirkland Water Department, March 13, 2017.

Response: No air sparging wells will be installed within the 400-foot setback zone of Municipal Water Supply Well #2 so no setback exception is needed for this municipal water source. The maximum feasible alternative setback between the air sparging wells and Emergency Backup Well #1 is approximately 80 feet. The location of the proposed air sparging system with respect to the Emergency Backup Well #1 is shown on Figure 1.

4. *Explain why air sparging is the best available control technology for the Blake site over the previously proposed enhanced bioremediation with a detailed comparison of the two technologies.*

Response: In the Corrective Action Plan (CAP) submitted for the site in September 2015, enhanced bioremediation consisting of the injection of hydrocarbon degrading bacteria, an enzyme-based surfactant and nutrient product (OESI) and an oxygen releasing compound was proposed. The IEPA expressed concerns related to this proposed approach in its June 15, 2016 response, noting:

> *The BioRenova MSDS indicates the solution is composed of calcium peroxide (75% minimum) and calcium hydroxide (25% minimum). An internet search of those compounds indicates that their pH is 11.7 standard units ("SU") and 12.4 SU respectively. The MSDS for OESI indicates that pH over 11.7 is incompatible with this material.*

In addition, the IEPA questioned if enhanced bioremediation was the BAT, noting that from 2002 through 2009, bioremediation and oxygen releasing compounds were injected at the Site on multiple occasions for the purpose of groundwater remediation and had demonstrated little progress over those 7 years. Given these general facts, the comments on the part of IEPA are understandable. However, some clarifying details related to the previous bioremediation efforts at the site are provided below (through previously submitted reports and verbal communication with the prior consultant working at the KQS site [Trans Environmental, Ltd.]):

- During the bioremediation efforts from 2002 through 2009 at the site, hydrocarbon bacterial agent was injected into wells MW-3A, MW-5, MW-6 and MW-8 (and likely others) within the area of the site that exhibited benzene and PNA impacts in groundwater.
- Oxygen Release Compound (ORC) socks were installed in some wells at the site.
- Water was withdrawn from some impacted wells at the site through use of a vacuum truck.

A review of these methodologies employed from 2002 through 2009 indicates that they are not likely to have been successful for the following reasons:

- The injection of a petroleum hydrocarbon biological inoculum or agent into monitoring wells within the impacted area of the site was not appropriate because SMA has subsequently determined that the groundwater there is

depleted of dissolved oxygen and the microorganisms would likely have all died shortly after injection. Moreover, there is no record that Trans Environmental, Ltd. ever measured dissolved oxygen concentrations in groundwater at the site, and it is unlikely that it could have effectively made these determinations because it sampled wells by bailer method and purging volumes. Additionally, numerous studies have shown that hydrocarbon-degrading microorganisms are ubiquitous in the subsurface and are capable of degrading a broad range of petroleum hydrocarbons, and that indigenous microorganisms have a distinct advantage over injected microorganisms because they are well adapted to the physical and chemical conditions in the subsurface where they inherently reside. As a result, attempts to enhance petroleum hydrocarbon biodegradation often meet with less than anticipated success.[2]

- It appears that ORC socks were hung in certain non-impacted monitoring wells at the site in an attempt to increase the dissolved oxygen concentrations in groundwater. These efforts were likely to have been unproductive since they would rely on the diffusion of the ORC from a few 2-inch monitoring wells to supply sufficient dissolved oxygen to the entire zone experiencing depleted dissolved oxygen conditions at the site (approximately 20,000 ft^2 in size) and would rely on only the natural groundwater flow to distribute that dissolved oxygen. Since diffusion in groundwater is a very weak process, the distribution of dissolved oxygen from these socks would only result in narrow bands of dissolved oxygen moving downgradient from the monitoring wells where they are installed with little lateral spreading and little overall impact on the depleted dissolved oxygen area.

- Pumping and treating groundwater is often used to contain impacted groundwater at sites but is generally be understood to be ineffective at remediating sites. Randomly vacuuming undetermined amounts of impacted groundwater from monitoring wells at the site is unlikely to have had much impact on the overall amount of petroleum hydrocarbon in the subsurface at the site.

A review of the analytical data collected by SMA at the KQS site indicates aerobic biodegradation of the contaminants of concern is being hindered by the depletion of dissolved oxygen within the area of impact as shown on Figures 1. This indicates that the constituents of concern are undergoing aerobic biodegradation where dissolved oxygen is available to indigenous, naturally occurring microorganisms in groundwater. These microorganisms biodegrade the petroleum hydrocarbons when sufficient dissolved oxygen concentrations are available. The lack of further benzene and PNA migration in groundwater to downgradient locations from the site is attributable to the general availability of dissolved oxygen in the shallow glacial groundwater outside the depleted zone on site.

Air sparging is a proven remediation technology to increase the dissolved oxygen in the groundwater at Sites with relatively consistent, coarse-grained sediments, an aquifer thickness greater than 5 feet, and where the water table is greater than 5 feet below the

[2] Wiedemeier, T.H., H.S. Rifai; C.J. Newell and J.T. Wilson. 1999. Natural Attenuation of Fuels and Chlorinated Solvents in the Subsurface; John Wiley & Sons.

ground surface.[3] All of these characteristics are present at the Site. In addition, air sparging offers the following advantages over the previously proposed use of enhanced bioremediation:

- Providing a relatively continuous supply of naturally occurring air to rapidly increase and maintain the dissolved oxygen content within the groundwater below the Site, thereby promoting the biodegradation of the hydrocarbons by indigenous bacteria.
- Is well-suited to the petroleum-based contaminants and the coarse-grained layer that exists beneath the surficial silt/clay layer at the Site.
- Is a proven technology to remediate the residual concentrations of benzene and PNAs in the groundwater to meet their respective GROs.
- Does not require the injection of surfactants, bacteria, oxygen releasing compounds, or other non-naturally occurring constituents within the setback of the municipal wells.
- The low COC concentrations at the Site will only require low-flow rate air sparging at the site and will not require the use of a soil vapor extraction system.
- Simplicity in system design and operation.
- Is not impacted by freezing temperatures.
- Requires minimal cost when compared to other remedial options.

5. *Provide a detailed justification for the placement of the air sparging wells in relation to the areas of contamination at the Blake site. How does placement of the air sparging wells address the plume of contamination at the site?*

Response: The air sparging system will consist of 3 zones, each with 4 – 6 air sparging wells (15 air sparging wells total). The proposed air sparging well locations at the site can be reviewed on Figure 1. The basis for the air sparging well locations are:

- Located within areas of the Site where dissolved oxygen measurements indicate the dissolved oxygen content of the groundwater below the Site is <0.5 mg/l.
- Located in close proximity to the area of contaminant impact (monitoring wells MW-1, MW-3A, MW-6, MW-14, and MW-15).

[3] Battelle. Final Air Sparging Guidance Document. NFESC Technical Report, TR-2193-ENV. Prepared for the Naval Facilities Engineering Command. August, 2001.

6. *Indicate whether IEPA will require Blake Leasing to obtain an Underground Injection Control Permit for Class V injection wells pursuant to 35 Ill. Adm. Code 704.147.*

Response: Yes, upon approval of this petition by the IPCB, Blake Leasing will obtain an Underground Injection Control Permit for Class V Injections wells pursuant to 35 IAC 704.147. A copy of the Class V Injection Well Permit will be included in the Amended Corrective Action Plan & Budget submitted to the Illinois EPA LUST Section.

7. *Elaborate on the conclusion that "turbidity is likely to have caused the low level detections of PNA compounds slightly above Class I GROs". Am. Pet. Exh. A at 7-8.*

(a) *Provide additional sampling reports to support this conclusion, if available.*

Response: It is known that the aqueous solubility of PNAs (a subset of polycyclic aromatic hydrocarbons, or PAHs) decreases with increasing molecular weight of the PNA in question, and that PNAs are considered hydrophobic or insoluble in aqueous solutions.[4,5] As a result, the mobility of PNAs in the subsurface is the result of adsorption onto sediment particles which are *suspended* in the groundwater; the PNAs are not actually *dissolved* in the groundwater.[6,7] Many studies have shown that the increased turbidity observed in surface waters (i.e. a flooded river) after a precipitation event is also coupled with an increased hydrophobic organic pollutant load (i.e. PNAs) within the water body.[8] This happens because the PNAs are actually bound to the sediment particles entering the water body due to run-off.[9] The same holds true for groundwater, where an increase in the turbidity of a well (due to improper development, a disturbance, or the absence of a properly installed sand filter-pack), is often coupled with an increase in the observed levels of PNAs in the well. This has been observed at the Kirkland Site in wells MW-30S and MW-30D as can be seen from a review of Table 1, below.

Date Sampled	MW-30S		MW-30D	
	Turbidity (NTU)	PNA Levels	Turbidity (NTU)	PNA Levels
3-Aug-16	101.98	< Class I GROs	56.85	< Class I GROs
15-Nov-16	520.53	**> Class I GROs**	113.38	**> Class I GROs**
23-Dec-16	5.1	< Class I GROs	8.42	< Class I GROs
7-Mar-17	7.8	< Class I GROs	7.9	< Class I GROs

Table 1: Sampling events for MW-30S and MW-30D showing turbidity versus Class I GRO exceedances for PNAs.

[4] J. Masih et al. Aerosol and Air Quality Res., **12**, (2012), p 515 -525.
[5] J. Masih et al. J. Hazardous Mater., **177**, (2010), p 190-198.
[6] J.C. Means et al. Science, **215** (1982), p 968-970.
[7] R.P. Schwarzenbach et al. Environmental Organic Chemistry, John Wiley and Sons, Inc, 1993.
[8] See Rugner et el. Science of the Total Environment, **490**, (2014), p 191-198., and associated citations.
[9] K. Schwarz et al. Environmental Pollution **159**, (2011), p 133-139.

The November 2016 sampling event conducted by SMA resulted in samples with elevated turbidity levels in MW-30S and MW-30D, which also corresponded to PNA concentrations that slightly exceeded the GROs. However, if the above table is examined, it is clear that when these wells were re-sampled in December 2016 and greater care was taken to ensure that the turbidity levels of samples was kept low, the PNA GROs were not exceeded.

(b) *If no additional sampling reports exist, comment on an exception condition requiring such sampling as a part of the remediation plan.*

Response: See response to 7a above. Ample data exists to support our assertion regarding the positive and direct correlation between turbidity and PNA concentrations.

(c) *What techniques will sampling technicians employ to "be watchful of turbidity during future sampling events"? Am. Pet. Exh. A at 8.*

Response: As noted above, prior environmental consultants on the Site conducted groundwater sampling using bailers to both purge and sample the wells. Sampling the wells in this fashion leads to the disturbance of the sediments surrounding the screened interval of the well, and has the potential to yield turbid samples and sediment/silt build-up in the bottom of the well. As described above in point 7(a) above, this also has the potential to increase the number of wells showing exceedances of the GROs for PNA concentrations. In fact, during the first sampling event that SMA conducted and in anticipation of using low-flow sampling methods, SMA personnel recorded the total depths for the site wells. This showed that many of the wells had multiple feet of sediment build up (relative to their completion depths) due to years of siltation that likely resulted from continuous bailer usage.

In the future, SMA will only use low-flow sampling techniques in order to collect groundwater samples at the Site. During low-flow sampling, the instrument records groundwater quality parameters (dissolved oxygen, specific conductivity, temperature, pH, dissolved oxygen, oxidation reduction potential, and turbidity) which are observable by sampling personnel in real-time. When purging initially commences, the turbidity readings are often higher due to the disturbance of the low-flow pump having been recently lowered into the well. Consequently, groundwater samples will not be acquired before the turbidity readings have returned to a lower level.

8. *Regarding groundwater monitoring:*

(a) *Describe, in detail, how Blake will determine if the air sparging is successful. List and explain the criteria that will be used to make that determination?*

Response: Currently there are 12 monitoring wells on site that exhibit depleted dissolved oxygen conditions: MW-1, MW-2, MW-3A, MW-5, MW-6, MW-7, MW-8, MW-11, MW-13, MW-14, MW-15, and MW-C. All these wells have

exhibited dissolved oxygen concentrations of less than 0.5 mg/L. A review of Figure 1 indicates that the proposed air sparging system wells are in the immediate vicinity of these 12 monitoring wells or hydraulically upgradient from them. As a result, the initial criteria for monitoring the success of the air sparging system will be increased dissolved oxygen concentrations in the groundwater at these 12 wells that currently exhibit depleted dissolved oxygen concentrations.

All of the monitoring wells at the Site have been and will continue to be sampled for BTEX and PNAs using low flow technologies on a quarterly basis. During groundwater sampling, field parameter data, including pH, conductivity, temperature, dissolved oxygen, redox potential, and turbidly will be collected. In addition, during system maintenance of the air sparging system, dissolved oxygen measurements will be collected from select monitoring wells, including MW-12 (upgradient /background), MW-1, MW-3A, MW-6, MW-14, and MW-15 (within the area of impact), and MW-30 / MW-30D (downgradient). To obtain these dissolved oxygen measurements, a peristaltic pump will be utilized to simulate low flow purging of the well and insure a representative sample of the glaciofluvial groundwater is acquired and a downhole dissolved oxygen probe will be utilized to collect the data. This dissolved oxygen data collection will be performed at least once a month for the first six months and on an as needed basis thereafter. It is anticipated that these dissolved oxygen measurements will allow better balancing and operation of the air sparging system.

An increase in the dissolved oxygen of the five monitoring wells within the area of impact will indicate that conditions have been made favorable for aerobic biodegradation to occur. The primary success of the air sparging system will be based on quarterly groundwater sampling of the site monitoring wells. SMA expects to observe significant improvement in the groundwater quality within the first year of groundwater sampling after the dissolved oxygen concentrations within the source area are consistently realized above 1 mg/L.

(b) *Provide comprehensive information about the potential for contaminant rebound after the air sparging has begun.*

Response: It is assumed that this comment was intended to ask about the potential for contaminant rebound after the air sparging system is shut off, and considering this, it is possible that there could be contaminant rebound to concentrations exceeding the GROs once the air sparging system is shut off. Should a confirmed exceedance occur, air sparging will be resumed until four consecutive quarters of groundwater samples demonstrate compliance after the system is shut off.

(c) *Explain how long Blake anticipates remediation will take?*

Response: It is anticipated that it may take 6 to 12 months for dissolved oxygen levels to consistently be sustained above 1 mg/L within the treatment zone. After sustaining consistently elevated dissolved oxygen levels in the groundwater, SMA anticipates the GROs will be achieved within six months. After that, it is

anticipated that four consecutive quarters of groundwater sampling will be required to demonstrate compliance with GROs . As a result, SMA estimates that it will likely take 24 to 30 months to complete the entire remediation process.

(d) *Comment on an exception condition requiring a minimum of four consecutive quarters of groundwater sampling to demonstrate compliance with the Groundwater Remediation Objectives after the air sparging injections have been discontinued.*

Response: Blake Leasing, LLC – Real Estate Series believes it is reasonable to demonstrate compliance with the Groundwater Remediation Objectives for four consecutive quarters of groundwater sampling after the air sparging has been discontinued, with remediation of the Site then being considered complete.

(e) *Explain whether the air sparging injections may change the character of the groundwater supply for the Village of Kirkland.*

Response: Only ambient air will be injected into the groundwater system below the Site to promote natural aerobic degradation of the benzene and PNAs. Therefore, no changes to the character of the groundwater supply for Kirkland are anticipated. Additionally, the Village of Kirkland wells are completed into the bedrock units below the site to a depth of between 630 feet and 737 feet below the surface grade and have surface casings that extend through the unconsolidated glacial deposits well into the bedrock. Based on these well completion details and the hydraulic testing performed by SMA at the site, SMA believes there is no direct hydraulic connection between the bedrock and glacial units at the site.[10]

9. *Regarding well closure:*

(a) *Indicate whether the air sparging wells will be abandoned and sealed after receipt of the NFR letter from IEPA.*

Response: Upon receipt of the NFR letter from the IEPA, Blake Leasing will abandon all monitoring and air sparging wells at the Site in accordance with the Illinois Department of Public Health and the DeKalb County Health Department requirements. Upon completion, well abandonment forms will be completed and submitted to the DeKalb County Health Department.

(b) *Comment on an exception condition requiring the wells to be properly abandoned and sealed upon IEPA's issuance of a NFR letter.*

Response: Please see response to item 9 (a) above.

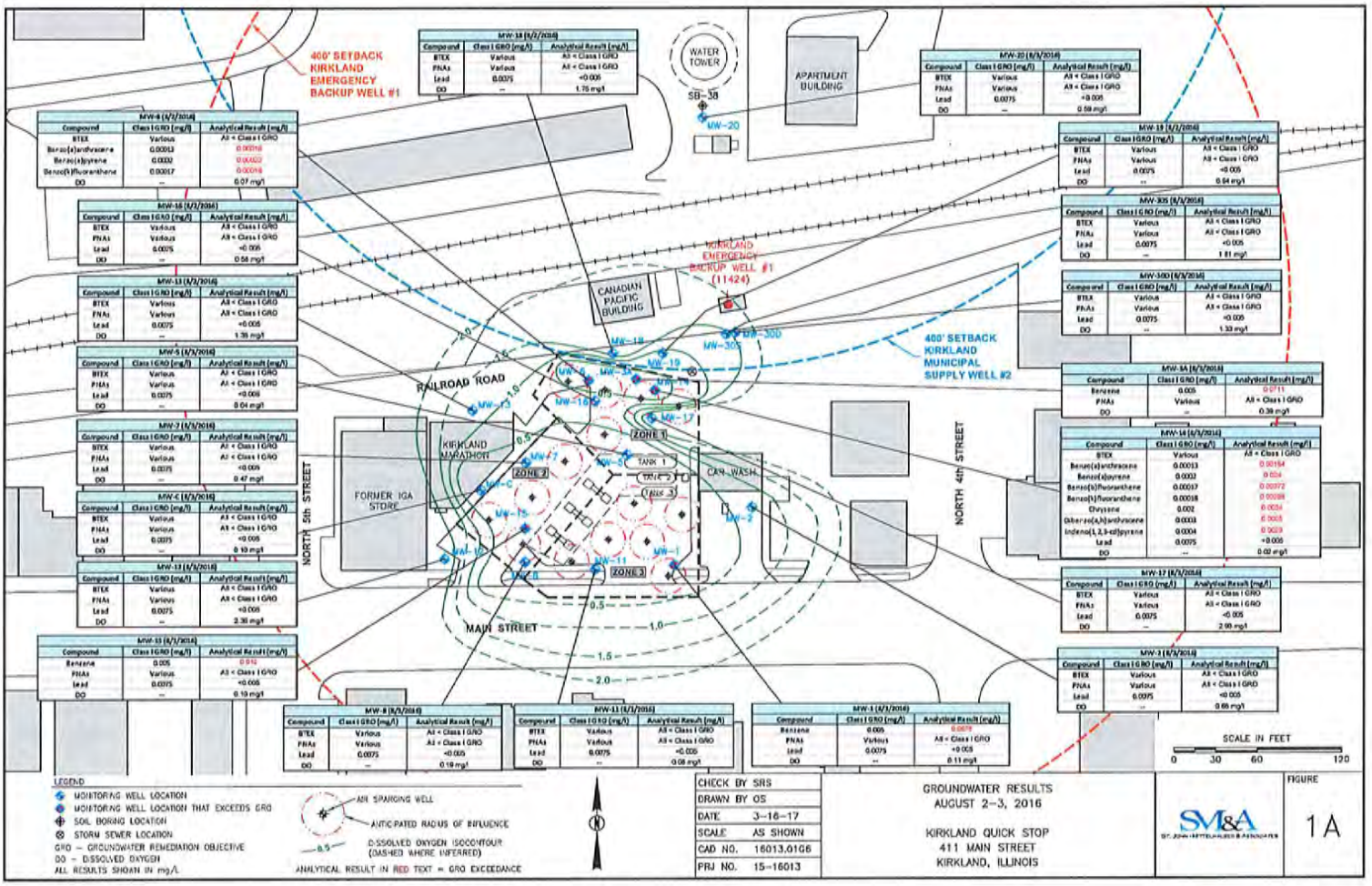
[10] Technical Report – Support for the Petition Requesting an Exception to Operate Three Underground Storage Tanks and Perform Remedial Measures Within the Water Well Setback Zone for Two Community Wells Owned by the Village of Kirkland; St. John – Mittelhauser & Associates, Inc. January 5, 2017.

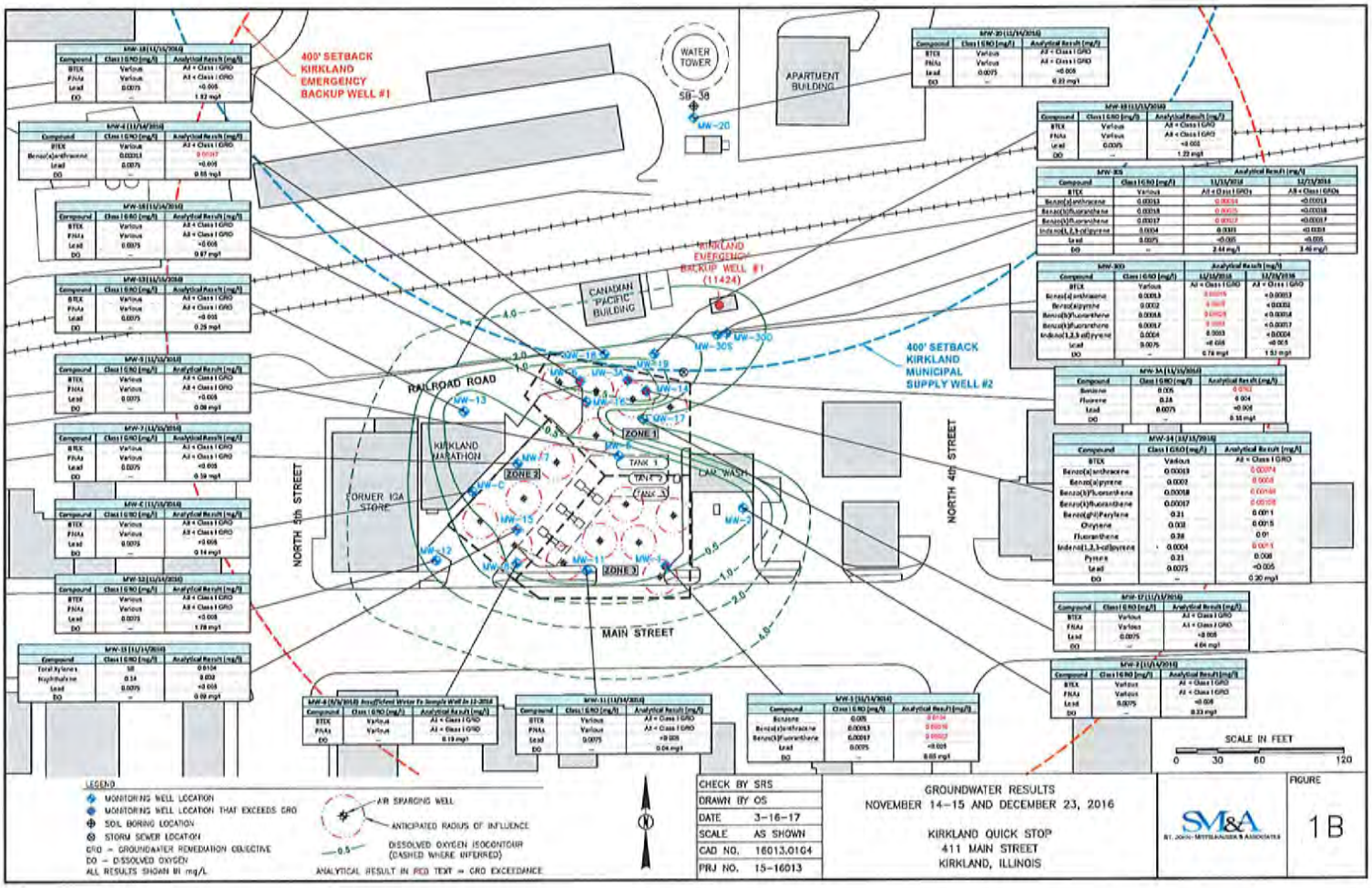
(c) *Comment on an exception condition terminating the water well setback exception automatically upon IEPA's issuance of a NFR letter.*

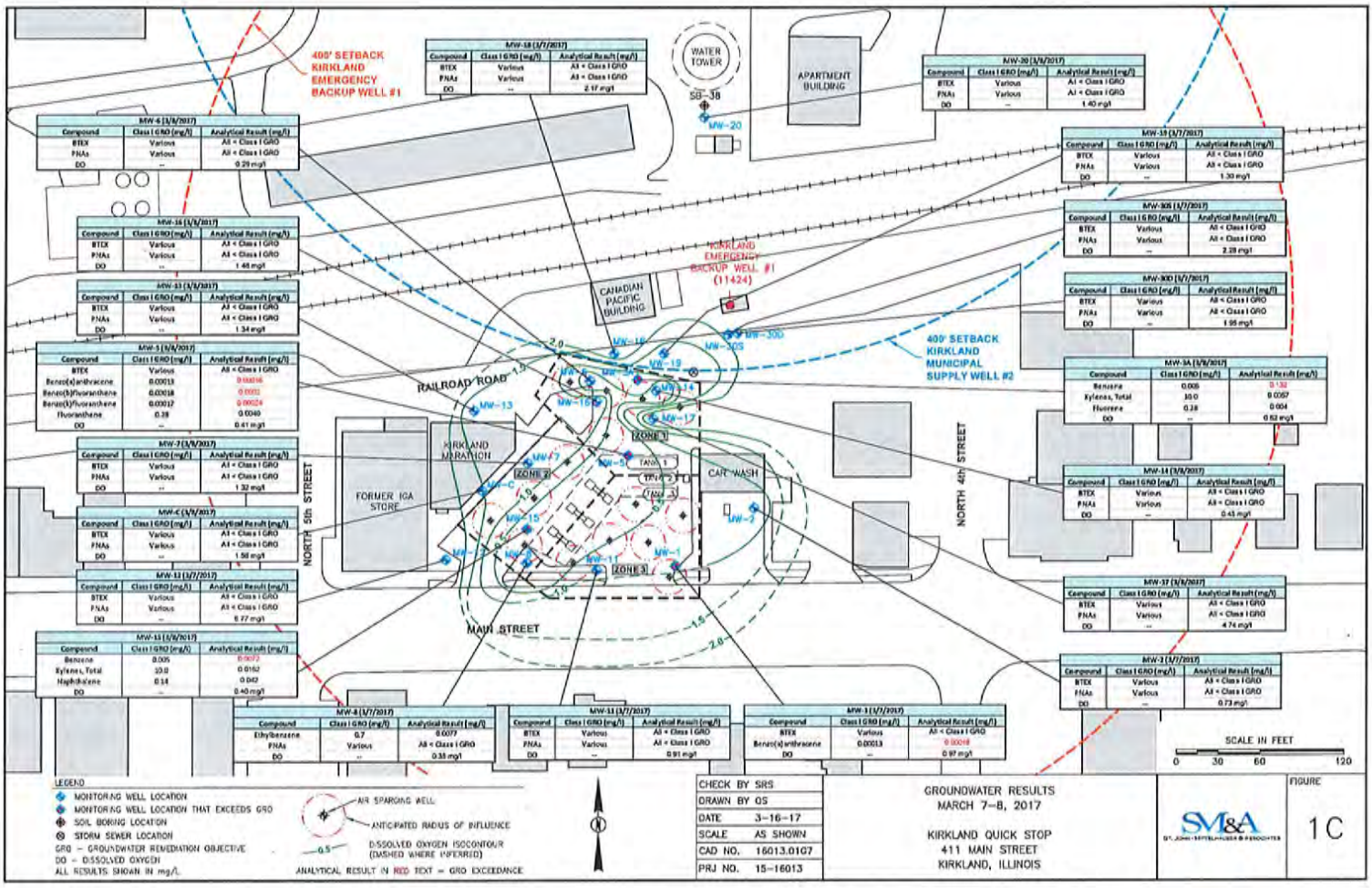
Response: Blake Leasing concurs that the exception condition for the water well setback exception for the air sparging wells be automatically terminated upon IEPA's issuance of an NFR letter.

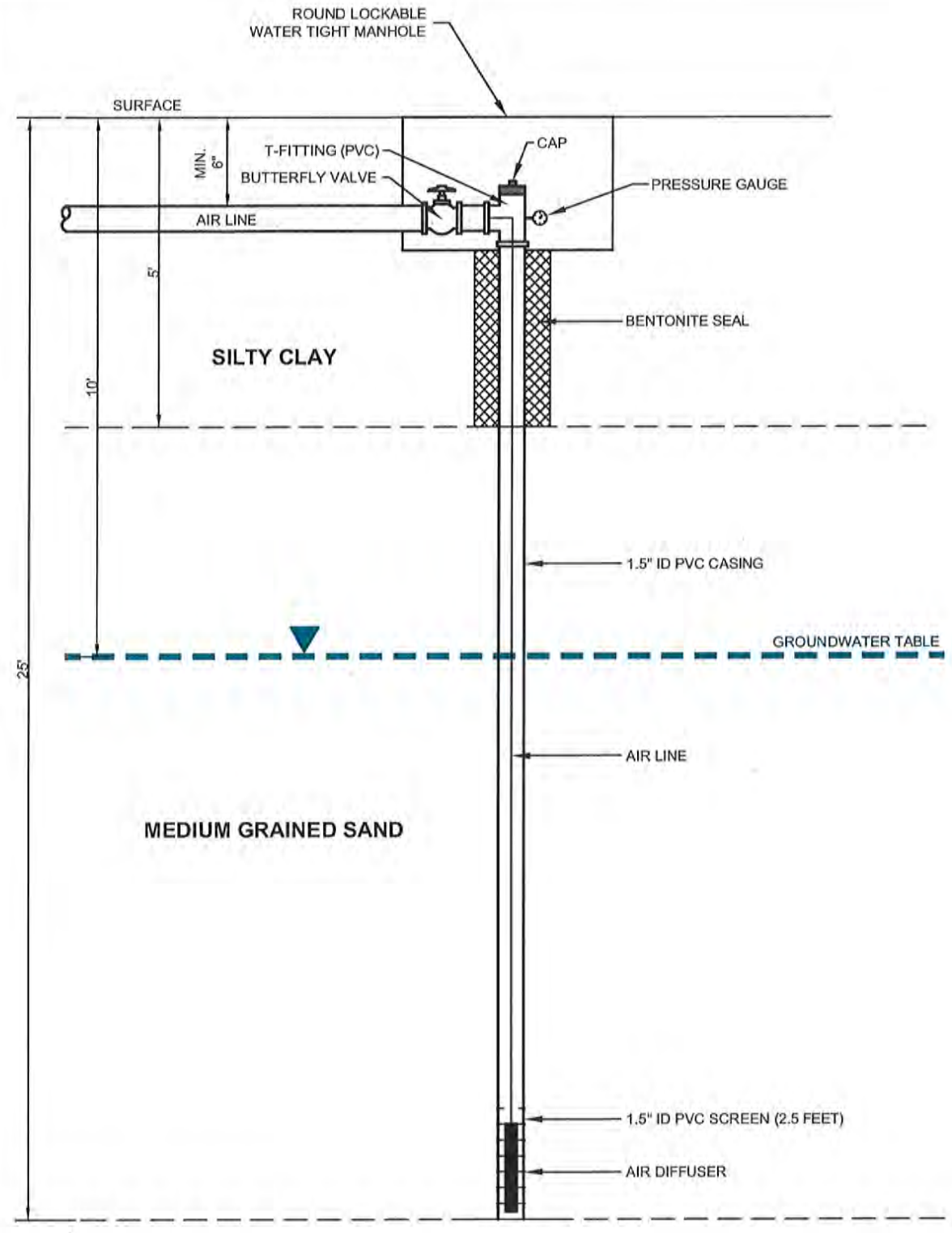
SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES

FIGURES


400' SETBACK KIRKLAND EMERGENCY BACKUP WELL #1
WATER TOWER
SB-38
MW-20
APARTMENT BUILDING
KIRKLAND EMERGENCY BACKUP WELL #1 (11424)
CANADIAN PACIFIC BUILDING
MW-30D
MW-30S
400' SETBACK KIRKLAND MUNICIPAL SUPPLY WELL #2
RAILROAD ROAD
KIRKLAND MARATHON
FORMER IGA STORE
CAR WASH
NORTH 5th STREET
NORTH 4th STREET
MAIN STREET
ZONE 1
ZONE 2
ZONE 3
TANK 1
TANK 2
TANK 3
SCALE IN FEET
0 30 60 120
LEGEND
MONITORING WELL LOCATION
MONITORING WELL LOCATION THAT EXCEEDS GRO
SOIL BORING LOCATION
STORM SEWER LOCATION
GRO – GROUNDWATER REMEDIATION OBJECTIVE
DO – DISSOLVED OXYGEN
ALL RESULTS SHOWN IN mg/L
AIR SPARGING WELL
ANTICIPATED RADIUS OF INFLUENCE
DISSOLVED OXYGEN ISOCONTOUR (DASHED WHERE INFERRED)
ANALYTICAL RESULT IN RED TEXT = GRO EXCEEDANCE
CHECK BY SRS
DRAWN BY OS
DATE 3-16-17
SCALE AS SHOWN
CAD NO. 16013.01G6
PRJ NO. 15-16013
GROUNDWATER RESULTS
AUGUST 2-3, 2016
KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS
SMA
FIGURE
1A


400' SETBACK
KIRKLAND
EMERGENCY
BACKUP WELL #1
WATER TOWER
APARTMENT BUILDING
SB-38
MW-20
KIRKLAND EMERGENCY BACKUP WELL #1 (11424)
CANADIAN PACIFIC BUILDING
MW-30S
400' SETBACK
KIRKLAND
MUNICIPAL
SUPPLY WELL #2
RAILROAD ROAD
KIRKLAND MARATHON
FORMER IGA STORE
CAR WASH
TANK 1
TANK 2
TANK 3
ZONE 1
ZONE 2
ZONE 3
NORTH 5th STREET
NORTH 4th STREET
MAIN STREET
SCALE IN FEET
0 30 60 120
LEGEND
MONITORING WELL LOCATION
MONITORING WELL LOCATION THAT EXCEEDS CRO
SOIL BORING LOCATION
STORM SEWER LOCATION
CRO = GROUNDWATER REMEDIATION OBJECTIVE
DO = DISSOLVED OXYGEN
ALL RESULTS SHOWN IN mg/L
AIR SPARGING WELL
ANTICIPATED RADIUS OF INFLUENCE
DISSOLVED OXYGEN ISOCONTOUR (DASHED WHERE INFERRED)
ANALYTICAL RESULT IN RED TEXT = CRO EXCEEDANCE
CHECK BY SRS
DRAWN BY OS
DATE 3-16-17
SCALE AS SHOWN
CAD NO. 16013.01G4
PRJ NO. 15-16013
GROUNDWATER RESULTS
NOVEMBER 14-15 AND DECEMBER 23, 2016
KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS
SM&A
FIGURE
1B

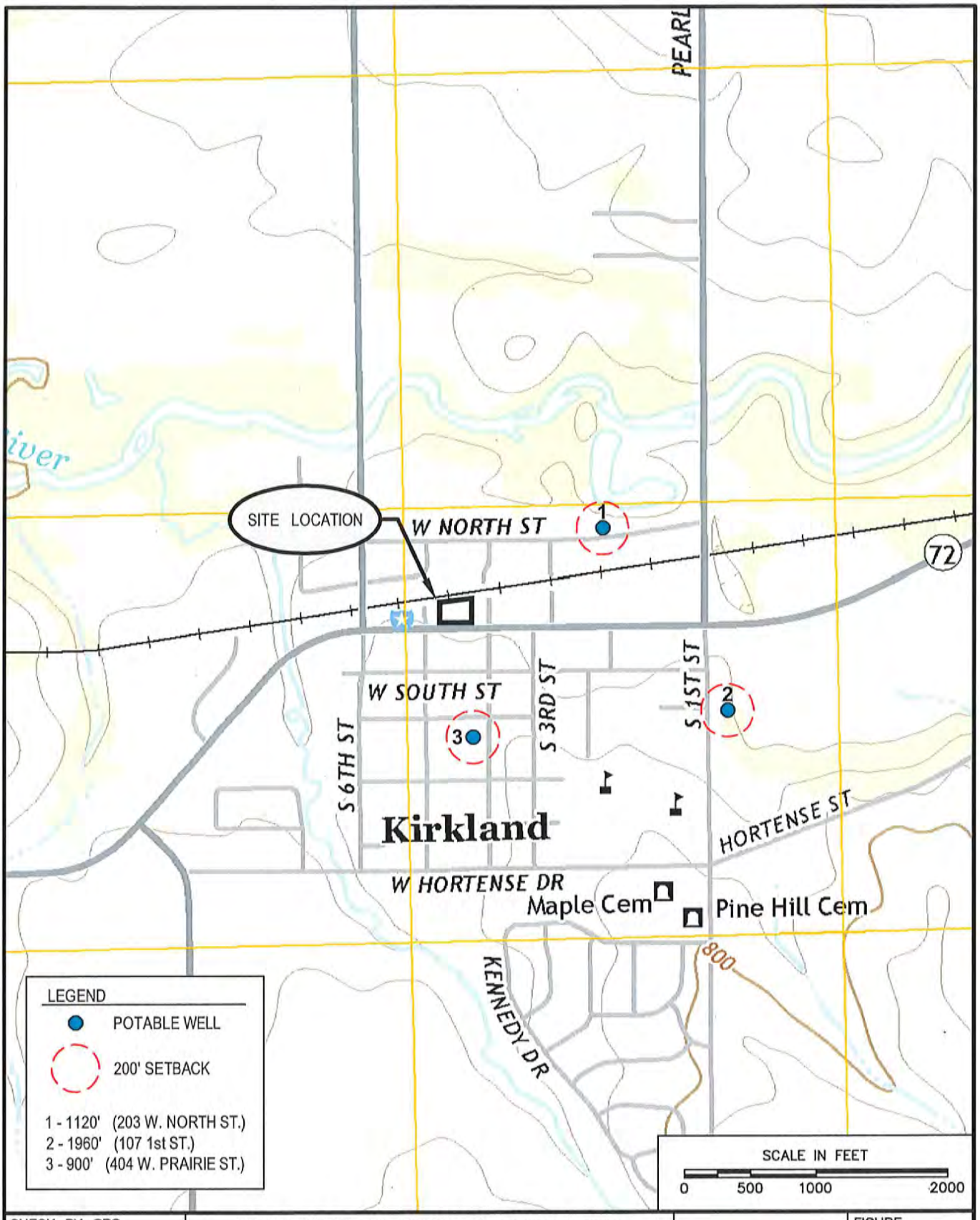

400' SETBACK
KIRKLAND
EMERGENCY
BACKUP WELL #1
WATER
TOWER
APARTMENT
BUILDING
SB-38
MW-20
CANADIAN
PACIFIC
BUILDING
KIRKLAND
EMERGENCY
BACKUP WELL #1
(11424)
400' SETBACK
KIRKLAND
MUNICIPAL
SUPPLY WELL #2
RAILROAD ROAD
KIRKLAND
MARATHON
FORMER IGA
STORE
CAR WASH
NORTH 5th STREET
NORTH 4th STREET
MAIN STREET
ZONE 1
ZONE 2
ZONE 3
SCALE IN FEET
0 30 60 120
LEGEND
MONITORING WELL LOCATION
MONITORING WELL LOCATION THAT EXCEEDS GRO
SOIL BORING LOCATION
STORM SEWER LOCATION
GRO - GROUNDWATER REMEDIATION OBJECTIVE
DO - DISSOLVED OXYGEN
ALL RESULTS SHOWN IN mg/L
AIR SPARGING WELL
ANTICIPATED RADIUS OF INFLUENCE
DISSOLVED OXYGEN ISOCONTOUR
(DASHED WHERE INFERRED)
ANALYTICAL RESULT IN RED TEXT = GRO EXCEEDANCE
CHECK BY SRS
DRAWN BY GS
DATE 3-16-17
SCALE AS SHOWN
CAD NO. 16013.0107
PRJ NO. 15-16013
GROUNDWATER RESULTS
MARCH 7-8, 2017
KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS
SM&A
FIGURE
1C



** NOT TO SCALE **

CHECK BY SRS DRAWN BY OS DATE 3-16-17 SCALE N.T.S. CAD NO. 16013.01L2 PRJ NO. 15-16013	AIR SPARGE WELL CONSTRUCTION DIAGRAM KIRKLAND QUICK STOP 411 MAIN STREET KIRKLAND, ILLINOIS	SM&A St. John	FIGURE 2


AGRICULTURAL
WEST NORTH STREET
NORTH 4th STREET
KIRKLAND MUNICIPAL SUPPLY WELL #2 (11425)
MW-31
400' SETBACK KIRKLAND MUNICIPAL SUPPLY WELL #2
WATER TOWER
APARTMENT BUILDING
SB-3B
MW-20
KIRKLAND EMERGENCY BACKUP WELL #1 (11424)
CANADIAN PACIFIC BUILDING
MW-30D
MW-30S
RAILROAD ROAD
MW-18
MW-6
MW-3A
MW-19
MW-13
MW-16
MW-14
MW-17
KIRKLAND MARATHON
MW-5
TANK 1
TANK 2
TANK 3
CAR WASH
MW-7
MW-C
MW-15
MW-2
FORMER IGA STORE
MW-12
MW-11
MW-1
MW-8
NORTH 4th STREET
400' SETBACK KIRKLAND EMERGENCY BACKUP WELL #1
MAIN STREET
NORTH 5th STREET
SCALE IN FEET
0 30 60 120
LEGEND
MONITORING WELL LOCATION
SOIL BORING LOCATION
STORM SEWER LOCATION
TANK 1: 4,000/3,000-GAL. PREMIUM
TANK 2: 10,000-GAL. REGULAR
TANK 3: 8,000-GAL. DIESEL
CHECK BY: CC
DRAWN BY: OS
DATE: 3-16-17
SCALE: AS SHOWN
CAD NO.: 16013.01E
PRJ NO.: 15-16013
SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES
KIRKLAND WELLS #1 AND #2
AND 400 FOOT SETBACK ZONES
KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS
FIGURE
3



CHECK BY	SRS
DRAWN BY	OS
DATE	3–16–17
SCALE	N.T.S.
CAD NO.	16013.01N
PRJ NO.	15–16013

HOMES WITHIN THE VILLAGE OF KIRKLAND THAT HAVE POTABLE WELL WATER SUPPLIES

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
4