RECEIVED
CLERK'S OFFICE

NOV 2 1 2007

STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

ORIGINAL

IN THE MATTER OF:	
PETITION OF BFI WASTE SYSTEMS OF NORTH AMERICA, INC. FOR AN ADJUSTED STANDARD WASTE DELISTING	**AS ~~07~~ 08-5** **(Adjusted Standard –Land)** **(Waste Delisting)**

NOTICE OF FILING

To: Robert A. Messina, Chief Legal Counsel
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276

Mr. Douglas Scott, Director
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276
(Without Attachment A)

Mary A. Gade, Regional Administrator
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Mr. Bill Child, Bureau Chief
Bureau of Land
Illinois Environmental Protection Agency
1021 North Grand Avenue East
Post Office Box 19276
Springfield, IL 62794-9276
(Without Attachment A)

Please take notice that on November 21, 2007, the undersigned caused to be filed with the Clerk of the Illinois Pollution Control Board the attached BFI Waste Systems of North America, Inc. Petition for Adjusted Standard Waste Delisting and Motion to File Reduced Number of Copies, copies of which are herewith served upon you.

By: Patricia F. Sharkey

Patricia F. Sharkey
McGuireWoods LLP
77 West Wacker Drive, Suite 4100
Chicago, Illinois 60601
Telephone: 312/849-8100

Attorney Reg.: 6181113

RECEIVED
CLERK'S OFFICE

NOV 21 2007

STATE OF ILLINOIS
Pollution Control Board

CERTIFICATE OF SERVICE

I, Patricia F. Sharkey, one of the attorneys for BFI Waste Systems of North America, Inc., hereby certify that I served a copy of the Petition for Adjusted Standard Waste Delisting and Motion to File Reduced Number of Copies upon those listed on the attached Notice of Filing on November 21, 2007 by depositing the same in the U.S. Mail, with First Class prepaid postage, at 77 West Wacker Drive, Chicago, Illinois 60601.

Patricia F. Sharkey

ORIGINAL

McGuireWoods LLP
77 West Wacker Drive, Suite 4100
Chicago, Illinois 60601
Telephone: 312/849-8100

\4883063.1

RECEIVED
CLERK'S OFFICE

NOV 2 1 2007

STATE OF ILLINOIS
Pollution Control Board

BEFORE THE ILLINIOS POLLUTION CONTROL BOARD

IN THE MATTER OF:

ORIGINAL

PETITION OF BFI WASTE SYSTEMS OF NORTH AMERICA, INC. FOR AN ADJUSTED STANDARD WASTE DELISTING	**AS ~~07~~ 08-5** **(Adjusted Standard –Land)** **(Waste Delisting)**

Motion to File Reduce Number of Copies

NOW COMES BFI Waste Systems of North America, Inc. ("BFI"), by its attorneys McGuireWoods LLP, and moves the Illinois Pollution Control Board ("Board") to allow the filing of a reduced number of copies (four plus an original) of the Weaver Boos Technical Support Document, Attachment 1 to the BFI Waste Systems of North America, Inc. Petition for Adjusted Standard Waste Delisting.

In support thereof, BFI states:

1. Board regulations require that for any document filed with the Board, the filing party must file nine copies plus an original. 35 Ill. Adm. Code 101.302(h).

2. BFI is today filing nine copies and an original of its Petition for Adjusted Standard Waste Delisting and all attachments with the exception of Attachment 1, the Weaver Boos Technical Support Document.

3. Because each copy of the Technical Support Document includes approximately six inches of materials, contained in two separate three-ring binders, BFI is requesting that the Board allow it to file four copies plus an original of the Weaver Boos Technical Support Document.

WHEREFORE, BFI requests that the Board grant this motion to allow the filing of a reduced number of copies of the Weaver Boos Technical Support Document, Attachment 1 to the Petition for Adjusted Standard.

Respectfully submitted,

BFI Waste Systems of North America, Inc.

By One of Its Attorneys

Patricia F. Sharkey
McGuireWoods LLP
77 West Wacker Drive, Suite 4100
Chicago, Illinois 60601
312/ 849-8100

Attorney Reg: 6181113

ED
ICE

BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

NOV 2 1 2007

STATE OF ILLINOIS
Pollution Control Board

IN THE MATTER OF:

ORIGINAL 08-6

PETITION OF BFI WASTE SYSTEMS OF NORTH AMERICA, INC. FOR AN ADJUSTED STANDARD WASTE DELISTING

AS 07-__
(Adjusted Standard –Land)
(Waste Delisting)

PETITION FOR ADJUSTED STANDARD WASTE DELISTING

NOW COMES BFI Waste Systems of North America, Inc. ("BFI"), by its attorneys McGuireWoods LLP, pursuant to Section 28.1 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/28.1, 35 Ill. Adm. Code Part 104, and 35 Ill. Adm. Code 720.122 (40 CFR 260.22), and petitions the Illinois Pollution Control Board ("Board") to grant an adjusted standard delisting landfill leachate generated at the closed Phase I Unit at BFI's Davis Junction Landfill.

INTRODUCTION

BFI is petitioning to delist leachate generated at the long-closed Phase I Unit at its Davis Junction Landfill in Davis Junction, Ogle County, Illinois.[1] Under the proposed Adjusted Standard, the management of the leachate at the Davis Junction Landfill will continue to be governed by the Illinois RCRA Post-Closure Permit, however, BFI will be allowed to transport and dispose of the leachate as a non-hazardous Illinois special waste. The delisting will apply to leachate collected at the Phase I Landfill Unit ("Phase I Unit") over the remaining RCRA Post-Closure Period which is anticipated to be seven years,

[1] The Davis Junction Landfill also includes two other closed landfill units (Phase II and III) that accepted solely municipal solid waste ("MSW"). The Phase I Unit is separated from the two closed MSW units (Phases II and III) by a clay berm and has completely separate leachate collection and storage systems. This petition pertains solely to the leachate generated in the Phase I Unit.

although this could be extended by the Illinois Environmental Protection Agency ("IEPA"). The maximum volume of leachate that is anticipated to be generated is less than 500,000 gallons per year.

The Phase I Unit leachate is currently classified as F039, a listed hazardous waste from non-specific sources under 35 IAC 721.131 (40 CFR 261.31(a)). F039 listed hazardous waste is defined as "leachate (liquids which have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under Subpart D." In this case, the Phase I Unit leachate is considered a hazardous waste due to the historic disposal of minor volumes of hazardous wastes (2%) within the Phase I Unit.

The leachate collected at the Phase I Unit is pumped via hard-pipe to a temporary holding tank with secondary containment and then hauled off-site for disposal. The leachate is not treated before disposal. It also is not stored in on-site impoundments or conveyed via on-site ditches.

Because there is no domestic sewage sewer system connecting the Davis Junction Landfill to a local waste water treatment facility ("WWTF"), this leachate cannot be disposed of pursuant to the RCRA domestic sewage exemption in 35 Ill. Adm. Code 721.104(a)(1) (corresponding to 40 CFR 261.4(a)(1)). (See U.S. EPA's "Little Known But Allowable Ways to Deal with Hazardous Waste," EPA 233-B-00-002, May 2000.)

As a result of its classification as F039 and the absence of a local sewer system, the leachate collected at the Phase I Unit must be disposed of at a hazardous waste disposal facility authorized to accept hazardous liquids. The closest facility authorized to accept liquid hazardous waste is the CID Recycle and Disposal ("CID") facility in

Calumet City, Illinois, over 100 miles from the Davis Junction Landfill. Should that facility become unavailable, the next closest liquid hazardous waste disposal facility is located in Ohio, 365 miles from the Davis Junction Landfill.

Hauling the Phase I Unit leachate this great distance is expensive. It also wastes energy, pollutes the air with diesel emissions, and increases the risk of highway accidents that could result in a release to the environment. In contrast, the leachate generated at the other two closed non-hazardous landfill units at the Davis Junction Landfill (Phase II and III) is hauled to the Interstate Pollution Control, Inc. ("IPC"), a centralized waste water treatment plant that chemically treats the leachate prior to discharge to a publicly owned waste water treatment facility ("POTW"). IPC is located on the outskirts of Rockford, only seven miles from the Davis Junction Landfill. This delisting would allow BFI to haul the Phase I Unit leachate to the IPC facility or another similarly equipped and more local facility. It would be hauled in the same manner as BFI currently hauls the Phase II and III Unit leachate, pursuant to an Illinois Special Waste manifest.

The constituents in the leachate are well known. BFI has monitored the leachate itself, as well as groundwater beneath the landfill, as required by the Illinois RCRA landfill program for over twenty-five years. The leachate data for the last nine years is included in **Appendix C of the Technical Support Document (Attachment 1 hereto) ("Technical Support Document").** A summary of that data is shown in the Comprehensive Constituent List in **Appendix D**. A summary of the Davis Junction Landfill groundwater monitoring results is included in **Appendix J**.

For purposes of this delisting, BFI has evaluated the leachate data collected over the last nine years. This time period was selected because a new cap was installed in 1998 and thus the post-1998 data is most reflective of current conditions and most indicative of future leachate quality and quantity. This evaluation includes several thousand individual data points. See **Appendix D, Technical Support Document.**

At Illinois EPA's suggestion, BFI compared this data to the monitoring data for the leachate generated by its non-hazardous Phase II and III landfill units. The fact that the constituents in the Phase I, II and III units are generally consistent in both nature and concentration, with the exception of a few constituents, supports the conclusion that this delisting is appropriate. (See side-by-side comparison in **Appendix D of the Technical Support Document**). Those constituents that differ and whether they warrant retaining this leachate as a hazardous waste are discussed in greater detail below in **Section 9 of the Technical Support Document**.

The length of time over which this leachate has already been monitored provides assurance that the quality of the leachate has stabilized. The type of hazardous constituents in the leachate has not significantly changed over nine years. To the extent there is variability in the concentrations of constituents, that variability is not statistically significant. See **Appendix D of the Technical Support Document.**

In recent years, the volume of leachate generated at the Phase I Unit has declined substantially from 468,300 gallons in 2002, to an annual average of 285,000 gallons for the four years of 2003 through 2006. The volume projected for 2007 is approximately 250,000 gallons. See **"Table 1 – Annual Hauling Date," Technical Support Document.** Declining volumes are expected because the landfill has been closed and capped for over twenty-four years. No new hazardous wastes have been introduced since

1983. Furthermore, no new hazardous wastes will be introduced in the future and the approved RCRA cap and liner assure that no outside contaminants enter the landfill.

Notwithstanding the fact that leachate production will naturally decline throughout the post-closure period, BFI endeavors to maximize leachate extraction in order to expedite final closure of the Phase I Unit. Increased leachate extraction can be achieved through active maintenance of the wells and pumps. For example, the volume of leachate generated in 2006 increased as a result of well replacement and installation of a new force main. Even maximizing leachate extraction, leachate volumes from the Phase I Unit are not expected to exceed 500,000 gallons per year in the future.

The duration of the proposed delisting will coincide with the duration of leachate collection regulatorily required by the RCRA Post-Closure Permit. Under that permit, the groundwater and leachate are already subject to annual monitoring. The proposed Adjusted Standard will increase monitoring of the leachate for the identified constituents of concern from annual monitoring to quarterly monitoring in the first year and semi-annual monitoring thereafter. This monitoring will provide both initial and on-going assurance that the qualitative nature of the leachate does not exceed the proposed delisting levels.

A. Standard of General Applicability from Which Adjusted Standard is Sought (35 Ill. Adm. Code 104.406(a))

The standard of general applicability from which this Adjusted Standard is sought is the Illinois regulation classifying the Phase I Unit leachate as a hazardous waste. Because the Phase I Unit accepted a small amount of one or more hazardous wastes during its operating life, the leachate generated at the Phase I Unit is currently classified as a listed hazardous waste from non-specific sources pursuant to 35 Ill. Adm. Code 721.31(a) . Specifically, this leachate is classified as "F039 – Leachate (liquids that have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under Subpart D of this Part.)" As a result of this classification, this leachate must be handled and disposed under the requirements of 35 Ill. Adm. Code Parts 720 – 728.

B. Statutory Basis of Regulation of General Applicability (35 Ill. Adm. Code 104.406.(b))

The Illinois hazardous waste regulations, including 35 Ill. Adm. Code Parts 720 - 728, were promulgated to implement the requirements of the federal Resource Conservation and Recovery Act of 1976 and the federal regulations at 40 CFR Parts 260-268. Specifically, the F039 hazardous waste classification 35 Ill. Adm. Code 721.31(a) is identical in substance to the federal F039 classification in 40 CFR 261.31(a).

C. Level of Justification Specified by Regulation of General Applicability (35 Ill. Adm. Code 104.406(c))

Section 720.122 of the Illinois regulations, 35 Ill. Adm. Code 720.122, reflects the requirements for delisting of a hazardous waste established in the federal RCRA regulations at 40 CFR 260.22. A person seeking to exclude a waste from a particular generating facility from the lists of listed hazardous waste contained in Subpart D of 35 Ill. Adm. Code 721 must file a petition meeting the requirements specified in 720.122(n) and such petition must be found by the Board to demonstrate the following:

> 1. That the waste produced by the particular generating facility does not meet any of the criteria under which the waste was listed as a hazardous or acute hazardous waste. (35 Ill. Adm. Code 720.122(a)(1));

2. That there is a reasonable basis to believe that factors (including additional constituents) other than those for which the waste was listed could cause the waste to be a hazardous waste, that such factors do not warrant retaining the waste as a hazardous waste. A Board determination under the preceding sentence must be made by reliance on, and in a manner consistent with, "EPA RCRA Delisting Program--Guidance Manual for the Petitioner," incorporated by reference in Section 720.111(a). (35 Ill Adm. Code 720.122(a)(2)); and

3. That a waste so excluded is not hazardous waste by operation of Subpart C of 35 Ill. Adm. Code 721, i.e. is not a hazardous waste by virtue of exhibiting one of the hazardous characteristics specified in Subpart C. (35 Ill. Adm. Code 720.122(a)(2))

D. Nature of Petitioner's Activity (35 Ill. Adm. Code 104.406(d))

1. Nature of Activity

As discussed in the introduction above and in greater detail in the **Technical Support Document**, BFI collects leachate generated pursuant to the closure requirements of an Illinois RCRA Post-Closure Permit (No. B-142-M-10 and M-11) at the closed Phase I Unit which accepted minor amounts of hazardous waste during its seven year operating life, i.e. from December 1976 through January 1983. The Phase I Unit was certified closed on December 5, 1984.

Detailed records of the nature and volume of hazardous wastes disposed of in the Phase I Unit have been kept. Those records demonstrate that 87% of the waste received was general municipal refuse, 11% was special waste, and the remaining 2% was considered hazardous waste. The total volume of waste placed in the Phase I Unit was approximately 1,900,000 cubic yards. Approximately 26,000 cubic yards (less than 2 percent) of that waste was defined as hazardous under RCRA and state law.

Of the 2% hazardous waste disposed of in the Phase I Unit, approximately 96% consisted of heavy metal sludges and the remaining 4% consisted primarily of spent solvent still bottoms, spent solvent sludges, petroleum refining residues, rodenticides, glycol, polystyrene, and pthalic anhydride. Specific information regarding the generator and quantities of each listed waste is included in **Appendix A** of the **Technical Support Document.**

Notably, the constituents in the Phase I Unit leachate closely resemble the constituents in the leachate generated at the Phase II and III Units, which BFI has also monitored for many years and which is not classified as a hazardous waste. See **Appendix D** of the **Technical Support Document.** The fact that the Phase I Unit leachate is not qualitatively different from the Phase II and II Units' leachate, supports the conclusion that the costs associated with handling this leachate as a hazardous waste are unwarranted.

Currently, the Phase I Unit leachate is transported for disposal by tanker truck to a permitted RCRA liquid hazardous waste treatment facility, the CID Facility at 138th and Bishop Ford Expressway in Calumet City, over 100 miles away. This delisting would allow the transportation and disposal of this leachate as an Illinois Special Waste at a closer waste water treatment facility, such as the "IPC" facility, which is located just seven miles from the landfill. BFI hauls the leachate from its non-hazardous Phase II and III Units to IPC. This Adjusted Standard will not only reduce costs, but will also reduce the use of diesel fuel, reduce the emissions generated by the over 200 mile roundtrip required to haul this waste to CID, and reduce the risk of a highway accident resulting in a release of the leachate directly to the environment.

2. Location of and Area Affected by Petitioner's Activity

Location:

Davis Junction Landfill – Phase I Unit
8902 N. Route 251
Davis Junction, Ogle County, Illinois 61020
RCRA ID Number: ILD980700751

Affected Area:

The Phase I Unit occupies approximately 29.5 acres which was operated as a combined municipal solid waste (MSW) and RCRA Subpart C waste disposal facility. The Davis Junction Landfill as a whole occupies approximately 160 acres. See **Figure 1 in the Technical Support Document**. The area immediately surrounding the Phase I Unit and the Davis Junction Landfill is predominantly farmland dotted with farm buildings. The landfill is located in Ogle County approximately one mile south of the Winnebago County line. The closest town is Davis Junction located approximately two miles to the south. Illinois Highway 20 and the outskirts of the City of Rockford are approximately four miles to the north. Interstate 39 is located approximately two miles east of the landfill.

The landfill adjoins Illinois Route 251 and the landfill truck entrance is located on Scott Road, just west of Route 251. (See the **Technical Support Document), Figure 1** (Topographic Map showing facility location) and **Figure 2** (Site Layout – including location of Phase I Unit). The over 100 mile route over which the Phase I Unit leachate currently must be transported is shown in the attached MapQuest route map. **Attachment 2 hereto.** For comparison, the seven mile route over which the delisted leachate could be transported to Interstate Pollution Control (IPC) on the outskirts of Rockford is shown in the attached MapQuest route map. **Attachment 3 hereto.**

3. Age of the Facility and Number of Employees

The Phase I Unit began operation in 1976 and thus is 31 years old this year. Two BFI employees oversee Post-Closure activities at the closed Davis Junction landfill site. In addition, the BFI hydrogeology, engineering and finance groups located at other BFI facilities have responsibilities pertaining to the Davis Junction Landfill site. BFI also has a number of consultants and contractors, including the landfill gas contractor, who perform monitoring and maintenance activities at the closed landfill site.

4. Pollution Control Equipment Already in Place

As is discussed in greater detail in the attached **Technical Support Document,** the closed Phase I Unit is capped and lined. The original leachate collection system began operation in 1982. An upgraded leachate collection and extraction system was completed in 1998 -1999. The leachate is not treated on-site nor is it stored in on-site impoundments, conveyed via on-site ditches or otherwise placed on the ground. Rather, the Phase I Unit leachate collection system conveys the leachate via hard-pipe to a RCRA permitted storage tank with secondary containment. Under this delisting, the on-site handling and storage of the Phase I Unit leachate would remain subject to RCRA hazardous waste requirements and pollution control equipment.

Pursuant to the conditions in the proposed Adjusted Standard, the Phase I Unit leachate would be transported and disposed of as a non-hazardous Illinois Special Waste, as defined in 35 Ill. Adm. Code Part 808, as is the similar leachate generated at the Davis Junction Phase II and III Units. As an Illinois Special Waste, off-site transportation of the leachate would be subject to Illinois Special Waste hauler permitting and manifesting safeguards in 35 Ill. Adm. Code Part 809.

The proposed Adjusted Standard also requires that the delisted leachate be disposed of at a permitted waste water treatment facility. At an industrial waste water treatment plant, such as the IPC facility in Rockford, the leachate would be subject to a chemical treatment process prior to discharge to a POTW. IPC's discharge must meet the requirements for a significant user waste water discharge authorization prior to being discharged to the POTW. At the POTW, the treatment technologies and pollution controls required for the POTW to achieve its Clean Water Act NPDES discharge limits must be in place.

5. Qualitative and Q uantitative Description of the Emissions, Discharges or Releases Currently Generated by Petitioner's Activity

The activity of hauling and disposing of the Phase I Unit leachate at a waste water treatment plant, such as either the CID facility or a more local treatment facility, is an environmentally sound approach to leachate disposal. Both of these options provide for more pre-treatment of the leachate than is applied to leachate which is generated at landfills that discharge directly to a sewer system pursuant to the RCRA domestic sewage exemption in 721.104 (40 CFR 261.4(a)). It also is a more environmentally protective approach to disposal than the use of an on-site impoundment.

Although the current leachate disposal at CID does not adversely impact groundwater because the ultimate discharge to the environment is treated to NPDES discharge requirements, the long distance hauling of the leachate does result in emissions to the environment, including carbon dioxide, nitrogen oxide, volatile organics, particulate, Hazardous Air Pollutants, and carbon black (known as "soot"). Those emissions can be quantified on a per mile basis using standard emission estimates for mobile source diesel fuel combustion. While the amount of emissions will vary with the efficiency of the vehicle's engine and pollution control equipment, it is obvious that the longer the hauling distance is, the greater the volume of emissions will be.

E. Efforts Necessary to Comply with Regulation of General Applicability (35 Ill. Adm. Code 104.406(e))

As discussed above, the Phase I Unit leachate, as a F039 hazardous waste, is currently required to be transported for disposal to a permitted RCRA liquid hazardous waste treatment facility. The closest such facility is the CID Recycle & Disposal Facility ("CID") at 138th and Bishop Ford Expressway in Calumet City, over 100 miles away. This delisting would allow the disposal of this leachate at a closer NPDES permitted waste water treatment facility, such as the Interstate Pollution Control, Inc. ("IPC") facility, which is located less than 10 miles from the landfill.

As stated in the 2006 Revised Post-Closure Care Estimates for the Phase I Unit, the cost of leachate transportation and disposal is approximately $0.338 per gallon of leachate disposed, while the cost of disposal for leachate designated as non-hazardous special waste is $0.045 per gallon (based upon the 2006 post-closure financial assurance estimate for disposal of the non-hazardous waste leachate generated at the Phase I and II Units). That would mean an annual cost savings of approximately $29,300 for every 100,000 gallons of waste water generated (RCRA Permit No. B-142). At the estimated maximum annual leachate extraction of 500,000 gallons, this would be an annual savings of $146,500.

Other theoretically available alternatives for the disposal of the Phase I Unit leachate include: 1) disposal at another hazardous waste disposal facility; 2) construction, operation and permitting of an on-site treatment facility or underground injection well; or 3) construction of a sewer system to convey the leachate to a waste water treatment facility. Regarding the first alternative, BFI has been unable to identify a permitted hazardous liquids disposal site that is closer than the CID facility in Calumet City. The next closest permitted liquid hazardous waste disposal facility is located in Ohio, 365 miles from the Davis Junction Landfill. Both the second and third alternatives, while theoretically feasible, would involve substantial capital and operating expenditures to permit, build and run entirely new on-site treatment and/or disposal facilities.

While liquid hazardous waste can be disposed of below the lowest drinking water aquifer via a properly permitted Class I underground injection well, such wells have the potential to adversely impact drinking water resources and require the presence of suitable geologic formations. All Class I hazardous waste injection wells disposing of a RCRA land-banned hazardous waste must either complement the well permit with a rigorous technical demonstration referred to as a "No-Migration Demonstration" or treat the waste to approved safe levels before disposal. Notably, Illinois has only four such wells in the entire state. *See Illinois EPA Underground Injection Control Program Web Page.*

Construction of on-site liquid hazardous waste treatment units would require that BFI duplicate the treatment technologies of a waste water treatment facility like IPC for a relatively small volume of waste water. Given the fact that the IPC facility is located just seven miles from the Davis Junction Landfill, the construction, permitting and operation of a separate waste water treatment facility to perform the same function would be a waste of resources.

The use of these costly and potentially risky alternatives is particularly unwarranted at a closed landfill with a limited remaining post-closure period. It is also unwarranted in light of the fact that the Phase I Unit leachate is very similar to the Phase II and III leachate which is classified as non-hazardous and which can be disposed of at a nearby NPDES permitted waste water treatment facility without pre-treatment or other capital expenditures.

F. Proposed Adjusted Standard (35 Ill. Adm. Code 104.406(f))

1. Proposed Language

BFI proposes that the Board adopt an Adjusted Standard based on the following conditions or such other conditions as the Board deems appropriate to achieve the relief sought under this petition:

> "Leachate generated at the closed Phase I Unit at the BFI Waste Systems of North America, Inc. Davis Junction Landfill in Davis Junction, Ogle County, Illinois shall not be deemed a hazardous waste pursuant to 35 Ill. Adm. Code 721 under the following circumstances:
>
> a) The Phase I Unit is subject to an Illinois Environmental Protection Agency RCRA Post –Closure Permit which prohibits the disposal of any new solid or liquid waste in the Phase I Unit, requires maintenance of the landfill cap and liner, and requires operation of a leachate collection system;
>
> b) The leachate is be hard-piped directly from the landfill to an on-site storage tank which is regulated under the RCRA Post-Closure Permit and is not stored or managed in a surface impoundment, conveyed by ditches or otherwise managed prior to transportation for off-site disposal;
>
> c) The leachate does not exhibit any characteristic of hazardous waste as defined in 35 Ill. Adm. Code 721.121, 721.122, 721123 and 721.124 and shall not exceed the delisting level concentrations in Table A below;

d) Within the first 12 months following the effective date of this delisting, BFI performs quarterly testing of a representative sample of the leachate for the constituents listed in Table A (below) and hazardous characteristics as defined in 35 Ill. Adm. Code 721.121, 721.122, 721123 and 721.124. If none of the delisting levels in Table A are confirmed to be exceeded, such testing shall continue on a semi-annual basis thereafter. If an initial sample concentration is observed above the delisting level, then a verification sample will be collected within 7 days and reanalyzed for the constituent(s) exhibiting a concentration greater than the delisting level. A confirmed exceedance of the delisting level will be deemed present if both the original and verification sample exhibit concentrations above the delisting level;

e) If concentrations of the constituents listed in Table A (below) are confirmed to exceed the delisting levels using the verification procedures described above in item (d) or if the leachate is confirmed to exhibit a hazardous characteristic, the leachate shall not be disposed of except as a hazardous waste until such time as it is demonstrated by the testing procedures below to meet the criteria of this Adjusted Standard. Prior to re-initiating management and disposal pursuant to this Adjusted Standard, BFI must perform additional testing, including a minimum of four representative samples taken over not less than a 14 day period, each of which confirms concentrations of F039 hazardous constituents below the delisting levels and the absence of any hazardous characteristic;

g) The leachate is transported in compliance with the requirements applicable to an Illinois Special Waste (35 Ill. Adm. Code Part 809) to a permitted waste water treatment facility located in Illinois and subject to the requirements of either Section 307(b) or Section 402 of the federal Clean Water Act prior to discharge;

h) At least 60 days prior to transporting the first load of delisted leachate, BFI shall provide a one-time written notification to the Illinois Environmental Protection Agency stating that it is commencing transportation of delisted leachate pursuant to this delisting and the name of the waste water treatment facility to which the leachate will be transported. If BFI changes disposal facilities, it shall provide to Illinois Environmental Protection Agency a one-time written notification of such change; and

i) BFI shall not transport the leachate delisted pursuant to this Adjusted Standard outside of the State of Illinois.

Table A

Constituent of Concern	Delisting Level (mg/L)
Arsenic	0.525
Barium	151
Benzene	0.153
Cadmium	0.409
Carbon Disulfide	118
Chromium	1,040

Dichloropropene, cis-1, 3-	1,000,000
Cobalt	118
Copper	24,700
Diethyl phthalate	1,270
Endrin	32,700
Ethylbenzene	57.2
Isobutyl alcohol	299
Lead	204
Mercury	0.22
Methanol	499
Methyl ethyl ketone	599
Methylene chloride	0.198
Methyl isobutyl ketone	79.8
Naphthalene	6.51
Nickel	76.8
Cresol, p-	5.37
Phenol	645
Styrene	6.2
Tetrachloroethylene	0.174
Tin	1180
Toluene	40.2
Trichloroethylene	0.164
Vanadium	57.1
Vinyl chloride	0.2
Xylenes (total)	886
Zinc	760
Dichloroethane, 1-1-	99.8
Dichloroethane, 1,2-	0.0354
Dioxane, 1,4-	100
Trichlorophenoxypripionic acid, 2,4, 5- (Silvex)	1.43
Dichlorophenoxyacetic acid, 2,4- (2,4-D)	1.86
Dimethylphenol, 2,4-	27.6
Acetone	99.8

2. Narrative Discussion of Proposed Adjusted Standard Language

The proposed Adjusted Standard addresses only leachate generated at the Phase I Unit of the Davis Junction landfill. The scope of the Adjusted Standard is also limited to leachate generated while the Phase I Unit is subject to a RCRA Post-Closure Permit. This limitation provides assurance that the quality of the leachate, which has already been demonstrated to be stable, will not vary because the RCRA Post-Closure Permit prohibits the disposal of any new waste, requires the maintenance of the existing landfill cap and liner, and also requires the operation of a leachate collection system. The Adjusted

Standard also provides assurance that the Phase I Unit leachate will continue to be managed on-site at the Davis Junction Landfill by way of a RCRA permitted leachate collection system and a RCRA permitted storage tank (Tank #1). The Adjusted Standard will not allow the leachate to be managed in a land impoundment, ditch or by any other means which could result in contamination of the leachate and/or a release of the leachate directly to the environment.

The proposed Adjusted Standard is limited in duration to the time during which a RCRA Post-Closure Permit requires operation of a leachate collection system. This is anticipated to be approximately seven years; however, BFI requests that no absolute time limit be established in the Adjusted Standard because Illinois EPA may require that the leachate collection system continue to operate for a longer period of time than BFI currently anticipates.

The proposed Adjusted Standard requires that a representative sample of the leachate be tested quarterly for the first year and semi- annually thereafter for a list of hazardous constituents which are listed in Table A. This testing regimen is consistent with, and in fact more stringent than, the initial quarterly and subsequent annual testing that U.S.EPA has required in similar delistings. *See Shell Oil Company - Deer Park, Texas, Exclusion for F039 and F037 Wastes, and Eastman Chemical Company – Longview, Texas Exclusion for Wastewater Treatment Sludge, F001, F002, F003, and F005, 40 CFR Part 261, Appendix IX, Table 1.* **(Attachment 4 hereto)**

The constituents of concern ("COC's") in Table A of the Adjusted Standard were derived as prescribed by EPA in the "EPA RCRA Delisting Program Guidance Manual for the Petitioner," March 23, 2000 ("Guidance Manual") and accepted by EPA in granting similar petitions for delisting. *See Guidance Manual, p. 3. Also see Hazardous Waste Delisting Petition, Shell Oil Company – Deer Park, Texas, Jan. 20, 2003, p. 35.* **(Attachment 5 hereto)**

First, the leachate was tested for a broad list of constituents, including all of the constituents in 35 Ill. Adm. Code 721, Appendix J, (40 CFR 261, Appendix IX). In 2005, BFI performed five additional sampling events which focused on any additional constituents which were the basis of EPA's F039 listing, any additional constituents contained in Table 1 – Maximum Concentration of Contaminants for the Toxicity Characteristic, 35 Ill. Adm. Code 721.124(b), (40 CFR 261.24(b)), and the ignitability, reactivity and corrosivity characteristics. This "initial list" is what Weaver Boos refers to as the Comprehensive Constituent List for the Phase I Unit leachate provided in **Appendix D** to the **Technical Support Document**. It includes over 230 constituents.

Table A in the Adjusted Standard includes all of the constituents found in the Phase I Unit leachate which have been detected at any time in fifteen sampling events over the last nine years. The delisting levels for that "final list" of constituents in Table A were derived respectively from the DRAS model, EPA published MCLs and toxicity standards, and a site and constituent specific risk assessment.

The Adjusted Standard requires that the concentrations of these constituents in the Phase I Unit leachate be less than or equal to the Table A delisting levels. The Adjusted Standard also requires that the leachate not exhibit a hazardous characteristic, i.e. ignitability, corrosivity, reactivity, or toxicity, as defined in 35 Ill. Adm. Code 721.121, 721.122, 721123 and 721.124, (40 CFR 261.121, 261.122, 261.123 and 261.124).

Consistent with similar EPA delistings, the Adjusted Standard requires that if a representative sample is confirmed to exceed the delisting levels or exhibits a hazardous characteristic (after excluding sampling or laboratory error), the leachate must be managed and disposed of as a hazardous waste until such time as subsequent tests of representative samples confirm compliance with the delisting levels. *See Shell Oil Company and Eastman Chemical delistings in 40 CFR 261, Appendix IX, Table 1-Wastes Excluded from Non-Specific Sources.* **(Attachment 4 hereto)**

The proposed Adjusted Standard requires that the Phase I Unit leachate be transported and disposed of as an Illinois Special Waste pursuant to 35 Ill. Adm. Code Part 809. This assures that the leachate will be tracked from the landfill to disposal by way of a Special Waste manifest.

The Adjusted Standard allows the leachate to be transported for disposal at a permitted waste water treatment facility subject to Clean Water Act discharge requirements. This is consistent with the domestic sewer exemption in 35 Ill. Adm. Code 721.104 (40 CFR 261.4 (a)). See discussion in **Section 9.3.2 of the Technical Support Document**. It is also consistent with the statutory exemption for certain F039 leachate found in 35 Ill. Adm. Code 721.104(b)(15)(A)(iv) (40 CFR 261.(b)(15(A)(iv)). That exemption exempts from the definition of hazardous waste certain leachate and gas condensate from landfills where certain listed hazardous wastes were disposed of, on certain conditions, including the condition that the waste stream is being transported for treatment and disposal at an off-site facility which is subject to regulation under Section 307(b) or 402 of the Federal Clean Water Act.

Consistent with similar EPA delistings, the Adjusted Standard requires that a one-time written notification be given to Illinois EPA, the applicable state regulatory agency, 60 days before commencing transportation of the delisted leachate. *See delisting conditions stated for Shell Oil Company and Eastman Chemical multi-source leachate delistings in 40 CFR 261, Appendix IX, Table 1- Wastes Excluded from Non-Specific Sources.* **Attachment 4 hereto**. Unlike the federal delistings, the Adjusted Standard in this case is limited to transportation and disposal within Illinois.

2. Efforts Necessary to Achieve Proposed Standard

As demonstrated by the nine years of leachate data presented with this petition, the quality of the Phase I Unit leachate has stabilized. The DRAS modeling results and risk analysis presented in the **Technical Support Document** demonstrate that the detected constituents will not pose a risk to health or the environment even at the highest concentrations detected over the last nine years and even in a worst case release scenario. Therefore, BFI does not anticipate any additional efforts will be required to achieve the conditions imposed by the proposed adjusted standard.

3. Cost Necessary to Achieve Proposed Standard

As indicated in Section E above, the cost of compliance with the proposed Adjusted Standard is anticipated to be approximately $0.045 per gallon of leachate. This is a cost savings of approximately $30,000 per 100,000 gallons when compared to the current cost of compliance.

F. Quantitative and Qualitative Environmental Impact of Compliance with Existing Regulations vs Adjusted Standard

The treatment the leachate receives at the CID facility, over 100 miles away, is not more protective of the environment than that which the leachate would be subject to at a more local non-hazardous industrial waste water treatment facility. The CID facility uses a biological treatment system to achieve its NPDES discharge limits. The IPC facility uses a chemical treatment process and discharges to a POTW, at which the final discharge is subject to NPDES discharge requirements.

The current long distance hauling of the Phase I Unit leachate is energy inefficient and generates excess air pollution in the form of diesel emissions, including carbon dioxide, nitrogen oxide, volatile organics, particulate, Hazardous Air Pollutants, and soot. Based on simple mathematics, hauling the leachate over ten times further to CID generates over 90% more emissions and uses 90% more fuel than hauling the leachate to the IPC facility. It also results in an increased potential for highway accidents resulting in releases to the environment.

G. Justification for the proposed Adjusted Standard (35 Ill. Adm. 104.406(h))

1. The Phase I Unit leachate does not meet the criteria for which F039 was listed as hazardous. (35 Ill. Adm. Code 720.122(a)(1))

Section 721.122(n) (40 CFR 260.22(n)) requires that a petitioner demonstrate that a waste does not meet any of the criteria under which the waste was listed as hazardous or acutely hazardous. The Phase I Unit leachate is considered "multi-source leachate" covered under the F039 listing. F039 is listed with the code "T" which indicates that it was listed as a hazardous waste based upon "toxicity." For a "T" waste, a delisting petitioner must either demonstrate that the waste does not contain the hazardous constituents that caused EPA to list the waste as hazardous, or, although containing one or more of those constituents, it does not meet the listing criteria when considering the listing factors in Section 721.111(a)(3)(A) through (K), (40 CFR 261.11(a)(3)(i) through (xi)).

As previously discussed, BFI has provided an extensive database on this leachate which includes nine years of testing, fifteen sampling events, and several thousand data points. That database includes test results for all of the constituents which formed the basis for which F039 was listed as a hazardous waste under 35 Ill. Code 721 (40 CFR 261). That testing demonstrates that the vast majority of those constituents have never been detected.

For those constituents that were detected, BFI, as a first step, modeled the risk posed by the leachate using the DRAS model specified in the "*EPA RCRA Delisting Program--Guidance Manual for the Petitioner*," incorporated by reference in Section 720.111(a). The DRAS model takes into account the Section 721.111(a)(3) factors, including the concentration of the constituent in the waste, health-based standards and the volume of waste that may be released in a plausible worst case scenario. In its most recent delisting opinion, the Board confirmed that the DRAS is the preferred model to be used in a delisting petition pursuant to Section 720.122. *See Petition of BP Products North America, Inc. for RCRA Waste Delisting Under 35 Ill. Adm. Code 720.122, AS 07-1 (Feb. 15, 2007 Opinion and Order p. 8).*

BFI used conservative assumptions in the DRAS modeling. BFI assumed direct land disposal of the leachate – assuming the possibility of an accidental release of an entire tanker truck of the Phase I Unit leachate - despite the fact that the Adjusted Standard requires that the leachate be disposed of at a permitted waste water treatment facility where it will be treated before ultimate disposal. This is consistent with EPA's position, cited in the Board's *BP Products Opinion and Order*, that land disposal is a worst case assumption. Use of the entire tank volume is consistent with EPA's worst case discharge planning volume for a tanker truck release, as stated in 40 CFR 112, Appendix D.

The DRAS model generated "delisting levels" for each of the modeled constituents. Comparing those "delisting levels" to the maximum concentration of each of the constituents detected over the last nine years, all but four of the constituents were consistently found in concentrations below the "delisting levels." For the four constituents that exceeded the delisting levels, methylene chloride, trichloroethylene, vinyl chloride, and 1,4-dioxane, BFI undertook additional analysis. That analysis is discussed in detail in Section 9.2 of the **Technical Support Document**.

2. Based on the criteria specified in the "EPA RCRA Delisting Program--Guidance Manual for the Petitioner," incorporated by reference in Section 720.111(a), there is a reasonable basis to believe that factors (including additional constituents) other than those for which F039 was listed could cause the waste to be a hazardous waste, that such factors do not warrant retaining the Phase I Unit leachate as a hazardous waste. (35 Ill Adm. Code 720.122(a)(2))

As discussed above, BFI's extensive database on the Phase I Unit leachate goes well beyond the constituents which formed the basis of EPA's F039 listing. It includes nine years of data for the entire Appendix IX list of hazardous constituents, as well as supplemental sampling for any ignitability, reactivity, and corrosivity, and additional toxicity characteristic constituents listed in Table 1 of 35 Ill. Adm. Code 721.124(b) (40

CFR 261.24(b)). There are 230 constituents in the Comprehensive Constituent List, **Appendix D to the Technical Support Document**.

As noted in Section G.1 above, BFI modeled all of the detected constituents using the DRAS model and found only four constituents which exceeded the DRAS "delisting levels."

Based on the very comprehensive list of constituents, the many years of sampling and many sampling events, and the conservative delisting levels reflected in the Adjusted Standard, there is no other reasonable basis to believe that the Phase I Unit leachate should be maintained as a hazardous waste.

3. The Phase I Unit leachate is not hazardous waste by operation of Subpart C of 35 Ill. Adm. Code 721, i.e. is not a hazardous waste by virtue of exhibiting one of the hazardous characteristics specified in Subpart C. (35 Ill. Adm. Code 720.122(a)(2))

As discussed in detail in **Section 7.3.1 of the Technical Support Document**, test data and generator knowledge demonstrate that the Phase I Unit leachate does not exhibit any hazardous characteristic.

H. Consistency with Federal Law (35 Ill. Adm. Code 104.406(i))

Federal law provides the regulatory framework for delisting this or any other hazardous waste. The proposed Adjusted Standard meets the requirements prescribed in 35 Ill. Adm. Code 720.122 which are identical in substance to the requirements for delisting a hazardous waste prescribed in 40 CFR 260.122.

I. Request for Hearing (35 Ill. Adm. Code 104.406(j))

BFI respectfully requests that a hearing be held in this matter pursuant to 35 Ill. Adm. Code 104.422 to allow for a full review of the proposed Adjusted Standard and the facts supporting this Petition.

J. Supporting Documents (35 Ill. Adm. Code 104.406(k))

See the **Technical Support Document attached hereto as Attachment 1.**

CONCLUSION

WHEREFORE, BFI requests that the Board grant an Adjusted Standard pursuant to Section 28.1 of the Illinois Environmental Protection Act ("Act"), 415 ILCS 5/28.1, delisting the leachate generated at the Phase Unit of the BFI Davis Junction Landfill consistent with the conditions in the Adjusted Standard proposed in this Petition or such other reasonable terms and conditions as the Board deems appropriate to provide the relief requested. BFI further requests that the Board schedule a hearing in this matter to allow full review of the proposed Adjusted Standard and the facts supporting this petition.

Respectfully submitted,

BFI WASTE SYSTEMS OF NORTH AMERICA, INC.

By One of Its Attorneys

Patricia F. Sharkey

Patricia F. Sharkey
McGuireWoods LLP
77 West Wacker Drive, Suite 4100
Chicago, Illinois 60601
Telephone: 312/849-8100

Attorney Reg.: 6181113

Attachments

1. Weaver Boos Technical Support Document, Petition to Delist Hazardous Waste, November 21, 2007.

2. MapQuest Route Map for route to CID Facility.

3. MapQuest Route Map for route to IPC Facility.

4. Federal Delistings for Shell Oil Company and Eastman Chemical Company, 40 CFR 261, Appendix IX, Table 1.

5. Hazardous Waste Delisting Petition, Shell Oil Company – Deer Park, Texas, January 20, 2003, p. 35.

Exhibit 1

Attachment 1

Attachment 1, Weaver Boos Consultants' Support Document, including the Signed Certification Statement, is contained in the attached Binders 1 and 2.

Exhibit 2

MAPQUEST. An AOL Company

Attachment 2

START **8902 N Il Route 251**
Davis Junction, IL 61020-9706, US

END **Calumet City, IL US**

Total Est. Time:
2 hours, 3 minutes

Total Est. Distance:
110.09 miles

	Maneuvers	**Distance**
START	**1:** Start out going NORTH on IL-251 N toward E SCOTT RD.	2.2 miles
	2: Turn RIGHT onto BAXTER RD / CR-11.	2.7 miles
NORTH 39	**3:** Merge onto I-39 N / US-51 N via the ramp on the LEFT toward ROCKFORD.	7.0 miles
EAST 90	**4:** Merge onto I-90 E toward CHICAGO (Portions toll).	83.1 miles
EAST 90	**5:** Keep LEFT to take I-90 E via EXIT 59A toward INDIANA TOLL RD (Portions toll) (Crossing into INDIANA).	12.1 miles
5 EXIT	**6:** Take the CALUMET AVE / US-41 exit- EXIT 5.	0.2 miles
	7: Turn LEFT onto S CALUMET AVE / US-41.	0.5 miles
	8: Turn RIGHT onto E CHICAGO ST / IN-312. Continue to follow IN-312.	0.4 miles
	9: Turn LEFT onto S HOHMAN AVE.	0.6 miles
	10: Turn RIGHT onto E SIBLEY ST (Crossing into ILLINOIS).	0.2 miles
	11: Turn LEFT onto S STATE LINE AVE / STATE LINE RD.	0.3 miles
	12: Turn RIGHT onto E 154TH ST / PULASKI RD.	0.2 miles
END	**13:** End at **Calumet City, IL US**	

Total Est. Time: 2 hours, 3 minutes **Total Est. Distance:** 110.09 miles

Sorry! When printing directly from the browser your map may be incorrectly cropped. To print the entire map, try clicking the **"Printer-Friendly"** link at the top of your results page.

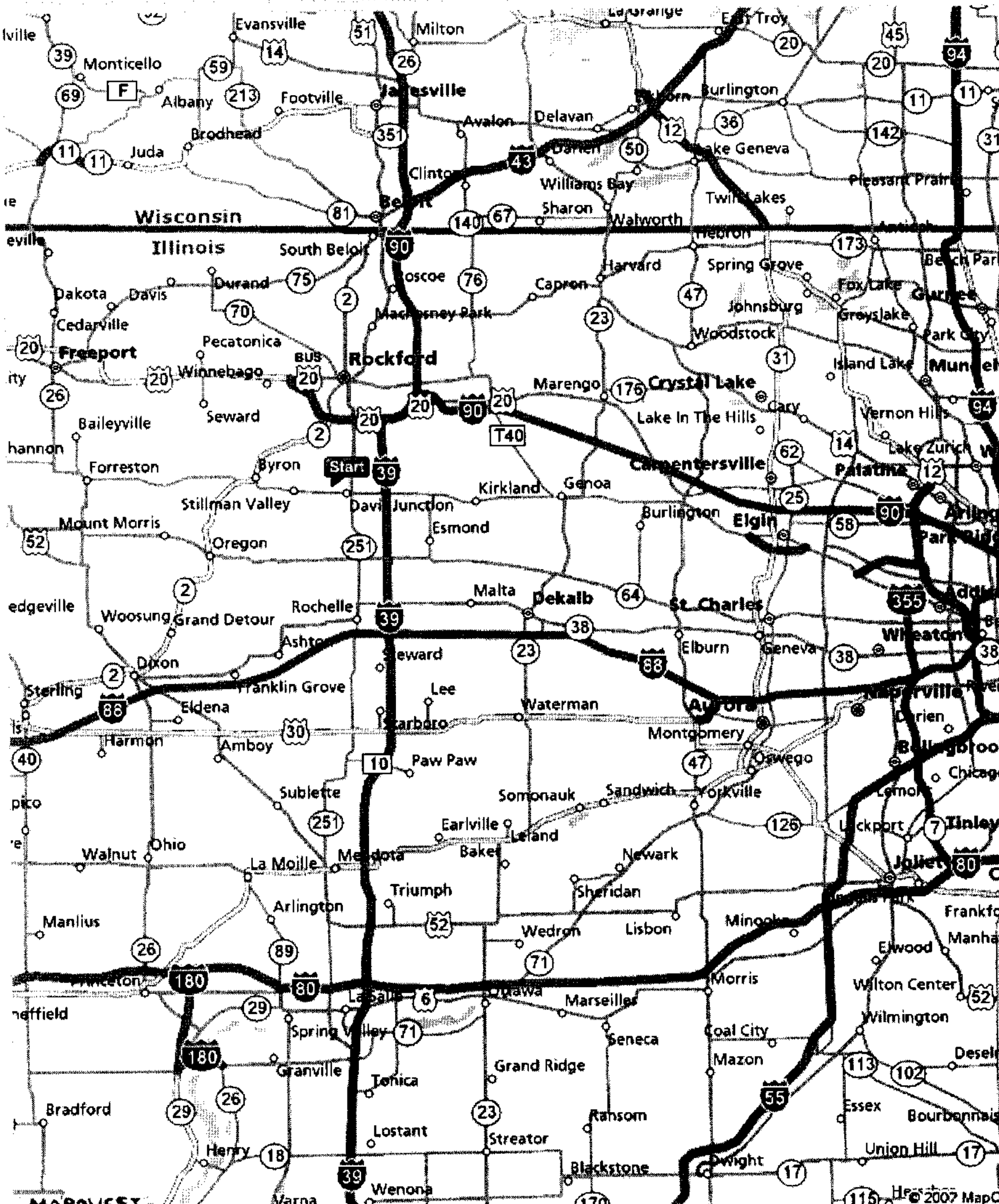


Exhibit 3

Sorry! When printing directly from the browser your map may be incorrectly cropped. To print the entire map, try clicking the **"Printer-Friendly"** link at the top of your results page.

MAPQUEST. An AOL Company

Attachment 3

START **8902 N Il Route 251**
Davis Junction, IL 61020-9706, US

END **4430 Boeing Dr**
Rockford, IL 61109-2931, US

Total Est. Time:
11 minutes

Total Est. Distance:
6.55 miles

Maneuvers		**Distance**
START	**1:** Start out going NORTH on IL-251 N toward E SCOTT RD.	5.3 miles
	2: Turn LEFT onto AIRPORT DR.	0.7 miles
	3: Turn RIGHT onto KISHWAUKEE ST.	0.3 miles
	4: Turn LEFT onto BOEING DR.	<0.1 miles
END	**5:** End at **4430 Boeing Dr** Rockford, IL 61109-2931, US	

Total Est. Time: 11 minutes **Total Est. Distance:** 6.55 miles

Sorry! When printing directly from the browser your map may be incorrectly cropped. To print the entire map, try clicking the **"Printer-Friendly"** link at the top of your results page.

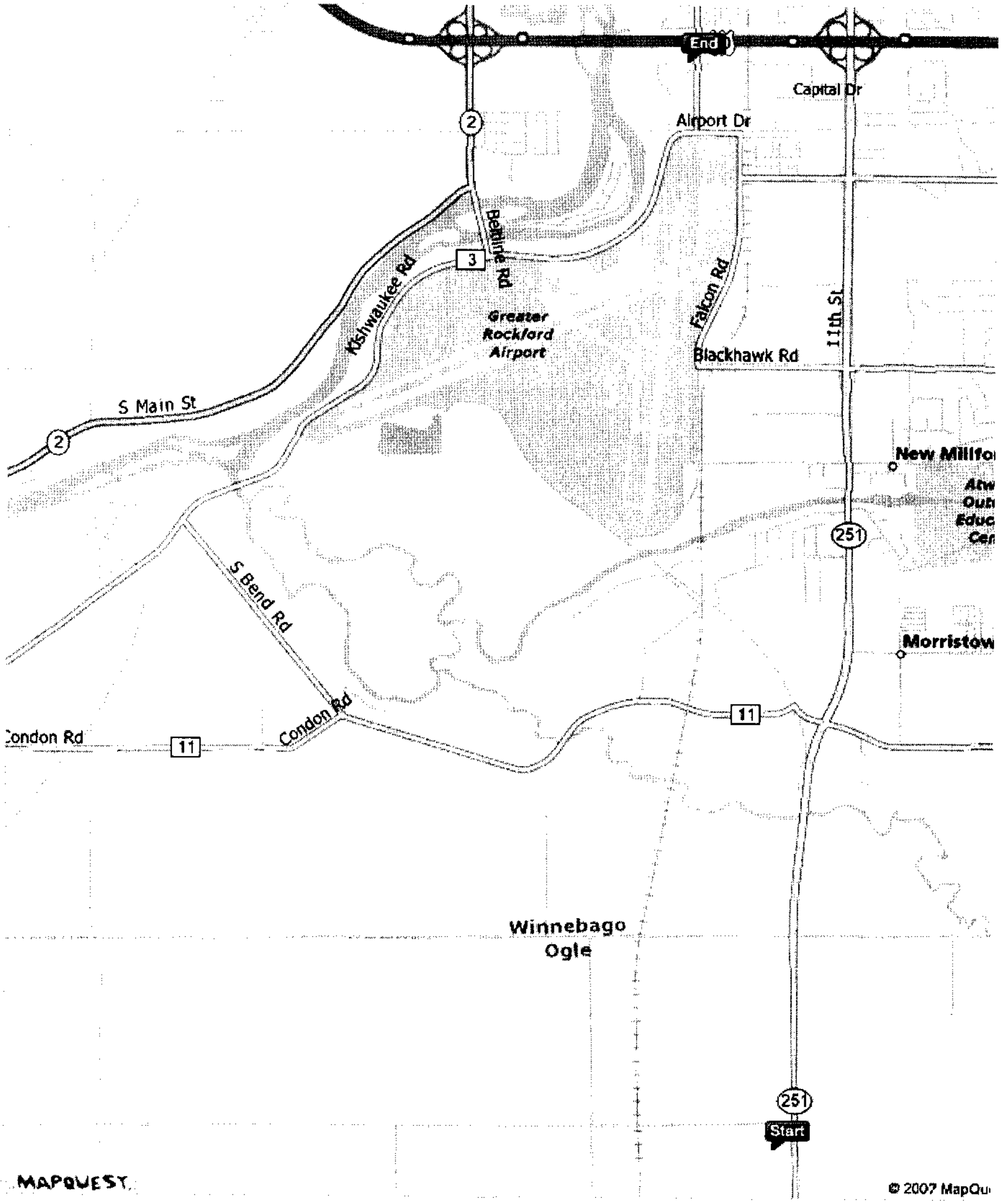


Exhibit 4

ATTACHMENT 4

40 C.F.R. Pt. 261, App. IX

Code of Federal Regulations Currentness
Title 40. Protection of Environment
Chapter I. Environmental Protection Agency (Refs & Annos)
Subchapter I. Solid Wastes
Part 261. Identification and Listing of Hazardous Waste (Refs & Annos)
Appendices to Part 261
Appendix IX to Part 261--Wastes Excluded Under §§ 260.20 and 260.22

TABLE 1-WASTES EXCLUDED FROM NON-SPECIFIC SOURCES

Facility	Address	Waste description
Shell Oil Company	Deer Park, TX	North Pond Sludge (EPA Hazardous Waste No. F037) generated one time at a volume of 15,000 cubic yards August 23, 2005 and disposed in a Subtitle D landfill. This is a one time exclusion and applies to 15,000 cubic yards of North Pond Sludge. (1) Reopener: (A) If, anytime after disposal of the delisted waste, **Shell** possesses or is otherwise made aware of any environmental data (including but not limited to leachate data or ground water monitoring data) or any other data relevant to the delisted waste indicating that any constituent identified for the delisting verification testing is at level higher than the delisting level allowed by the Division Director in granting the petition, then the facility must report the data, in writing, to the Division Director within 10 days of first possessing or being made aware of that data. (B) If **Shell** fails to submit the information described in paragraph (A) or if any other information is received from any source, the Division Director will make a preliminary determination as to whether the reported information requires EPA action to protect human health or the environment. Further action may include suspending, or revoking the exclusion, or other appropriate response necessary to protect human health and the environment. (C) If the Division Director

determines that the reported information does require EPA action, the Division Director will notify the facility in writing of the actions the Division Director believes are necessary to protect human health and the environment. The notice shall include a statement of the proposed action and a statement providing the facility with an opportunity to present information as to why the proposed EPA action is not necessary. The facility shall have 10 days from the date of the Division Director's notice to present such information.

(D) Following the receipt of information from the facility described in paragraph (C) or if no information is presented under paragraph (C), the Division Director will issue a final written determination describing the actions that are necessary to protect human health or the environment. Any required action described in the Division Director's determination shall become effective immediately, unless the Division Director provides otherwise.

(2) Notification Requirements: **Shell** must do the following before transporting the delisted waste: Failure to provide this notification will result in a violation of the delisting petition and a possible revocation of the decision.

(A) Provide a one-time written notification to any state regulatory agency to which or through which they will transport the delisted waste described above for disposal, 60 days before beginning such activities.

(B) Update the one-time written notification, if they ship the delisted waste to a different disposal facility.

(C) Failure to provide this notification will result in a violation of the delisting variance and a possible revocation of the decision.

Shell Oil Company	Deer Park, TX	Multi-source landfill leachate (EPA Hazardous Waste No. F039) generated at a maximum annual rate of 3.36 million gallons (16,619 cu. yards) per calendar year after August 23, 2005 and disposed in accordance with the TPDES permit. The delisting levels set do not relieve **Shell** Oil Company of its duty to comply with the limits set

in its TPDES permit. For the exclusion to be valid, **Shell** Oil Company must implement a verification testing program that meets the following paragraphs:

(1) Delisting Levels: All total concentrations for those constituents must not exceed the following levels (mg/l). The petitioner must analyze the aqueous waste on a total basis to measure constituents in the multi-source landfill leachate.

Multi-source landfill leachate (i) Inorganic Constituents Antimony-0.0204; Arsenic-0.385; Barium-2.92; Copper-418.00; Chromium-5.0; Cobalt-2.25; Nickel-1.13; Selenium-0.0863; Thallium-0.005; Vanadium-0.838

(ii) Organic Constituents Acetone-1.46; Acetophenone-1.58; Benzene-0.0222; p-Cresol-0.0788; Bis(2-ethylhexyl)phthlate-15800.00; Dichloroethane, 1,2-0.0803; Ethylbenzene-4.51; Fluorene-1.87; Napthalene-1.05; Phenol-9.46; Phenanthrene-1.36; Pyridine-0.0146; 2,3,7,8-TCDD equivalents as TEQ-0.0000926; Toluene-4.43; Trichloropropane-0.000574; Xylenes (total)-97.60

(2) Waste Management:

(A) **Shell** Oil Company must manage as hazardous all multi-source landfill leachate generated, until it has completed initial verification testing described in paragraph (3)(A) and (B), as appropriate, and valid analyses show that paragraph (1) is satisfied.

(B) Levels of constituents measured in the samples of the multi-source landfill leachate that do not exceed the levels set forth in paragraph (1) are non-hazardous. **Shell** Oil Company can manage and dispose of the non-hazardous multi-source landfill leachate according to all applicable solid waste regulations.

(C) If constituent levels in a sample exceed any of the delisting levels set in paragraph (1), **Shell** Oil Company can collect one additional sample and perform expedited analyses to verify if the constituent exceeds the delisting level. If this sample confirms the exceedance, **Shell** Oil Company must, from that point forward, treat the waste as hazardous until it is demonstrated that the waste again meets the levels in paragraph (1).

(D) If the facility has not treated the waste, **Shell** Oil Company must manage and dispose of the waste generated under Subtitle C of RCRA from the time that it becomes aware of any exceedance.

(E) Upon completion of the Verification Testing described in paragraph 3(A) and (B) as appropriate and the transmittal of the results to EPA, and if the testing results meet the requirements of paragraph (1), **Shell** Oil Company may proceed to manage its multi-source landfill leachate as non-hazardous waste. If Subsequent Verification Testing indicates an exceedance of the delisting levels in paragraph (1), **Shell** Oil Company must manage the multi-source landfill leachate as a hazardous waste until two consecutive quarterly testing samples show levels below the delisting levels in Table I.

(3) Verification Testing Requirements: **Shell** Oil Company must perform sample collection and analyses, including quality control procedures, using appropriate methods. As applicable to the method-defined parameters of concern, analyses requiring the use of SW-846 methods incorporated by reference in 40 CFR 260.11 must be used without substitution. As applicable, the SW-846 methods might include Methods 0010, 0011, 0020, 0023A, 0030, 0031, 0040, 0050, 0051, 0060, 0061, 1010A, 1020B, 1110A, 1310B, 1311, 1312, 1320, 1330A, 9010C, 9012B, 9040C, 9045D, 9060A, 9070A (uses EPA Method 1664, Rev. A), 9071B, and 9095B. Methods used must meet Performance Based Measurement System Criteria in which the Data Quality Objectives demonstrate that representative samples of the **Shell**-Deer Park multi-source landfill leachate are collected and meet the delisting levels in paragraph (1).

(A) Initial Verification Testing: After EPA grants the final exclusion, **Shell** Oil Company must do the following:

(i) Within 60 days of this exclusions becoming final, collect four samples, before disposal, of the multi-source landfill leachate.

(ii) The samples are to be analyzed and compared against the delisting levels in paragraph (1).

(iii) Within sixty (60) days after this exclusion becomes final, **Shell** Oil Company will report initial verification analytical test data for the multi-source landfill leachate, including analytical quality control information for the first thirty (30) days of operation after this exclusion becomes final. If levels of constituents measured in the samples of the multi-source landfill leachate that do not exceed the levels set forth in paragraph (1) are also non-hazardous in two consecutive quarters after the first thirty (30) days of operation after this exclusion become effective, **Shell** Oil Company can manage and dispose of the multi-source landfill leachate according to all applicable solid waste regulations.

(B) Subsequent Verification Testing: Following written notification by EPA, **Shell** Oil Company may substitute the testing conditions in (3)(B) for (3)(A). **Shell** Oil Company must continue to monitor operating conditions, and analyze one representative sample of the multi-source landfill leachate for each quarter of operation during the first year of waste generation. The sample must represent the waste generated during the quarter. After the first year of analytical sampling verification sampling can be performed on a single annual sample of the multi-source landfill leachate. The results are to be compared to the delisting levels in paragraph (1).

(C) Termination of Testing:

(i) After the first year of quarterly testing, if the delisting levels in paragraph (1) are being met, **Shell** Oil Company may then request that EPA not require quarterly testing. After EPA notifies **Shell** Oil Company in writing, the company may end quarterly testing.

(ii) Following cancellation of the quarterly testing, **Shell** Oil Company must continue to test a representative sample for all constituents listed in paragraph (1) annually.

(4) Changes in Operating Conditions: If **Shell** Oil Company significantly changes the process described in its petition or starts any processes that generate(s) the waste that may or could significantly affect the composition or type of waste

generated as established under paragraph (1) (by illustration, but not limitation, changes in equipment or operating conditions of the treatment process), it must notify EPA in writing; it may no longer handle the wastes generated from the new process as nonhazardous until the wastes meet the delisting levels set in paragraph (1) and it has received written approval to do so from EPA.

(5) Data Submittals: **Shell** Oil Company must submit the information described below. If **Shell** Oil Company fails to submit the required data within the specified time or maintain the required records on-site for the specified time, EPA, at its discretion, will consider this sufficient basis to reopen the exclusion as described in paragraph 6. **Shell** Oil Company must:

(A) Submit the data obtained through paragraph 3 to the Section Chief, Region 6 Corrective Action and Waste Minimization Section, EPA, 1445 Ross Avenue, Dallas, Texas 75202-2733, Mail Code, (6PD-C) within the time specified.

(B) Compile records of operating conditions and analytical data from paragraph (3), summarized, and maintained on-site for a minimum of five years.

(C) Furnish these records and data when EPA or the state of Texas request them for inspection.

(D) Send along with all data a signed copy of the following certification statement, to attest to the truth and accuracy of the data submitted:

Under civil and criminal penalty of law for the making or submission of false or fraudulent statements or representations (pursuant to the applicable provisions of the Federal Code, which include, but may not be limited to, 18 U.S.C. 1001 and 42 U.S.C. 6928), I certify that the information contained in or accompanying this document is true, accurate and complete.

As to the (those) identified section(s) of this document for which I cannot personally verify its (their) truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

If any of this information is determined by EPA in its sole discretion to be false, inaccurate or incomplete, and upon conveyance of this fact to the company, I recognize and agree that this exclusion of waste will be void as if it never had effect or to the extent directed by EPA and that the company will be liable for any actions taken in contravention of the company's RCRA and CERCLA obligations premised upon the company's reliance on the void exclusion.

(6) Reopener:

(A) If, anytime after disposal of the delisted waste, **Shell** Oil Company possesses or is otherwise made aware of any environmental data (including but not limited to leachate data or groundwater monitoring data) or any other data relevant to the delisted waste indicating that any constituent identified for the delisting verification testing is at a level higher than the delisting level allowed by the Division Director in granting the petition, then the facility must report the data, in writing, to the Division Director within 10 days of first possessing or being made aware of that data.

(B) If the annual testing of the waste does not meet the delisting requirements in paragraph 1, **Shell** Oil Company must report the data, in writing, to the Division Director within 10 days of first possessing or being made aware of that data.

(C) If **Shell** Oil Company fails to submit the information described in paragraphs (5),(6)(A) or (6)(B) or if any other information is received from any source, the Division Director will make a preliminary determination as to whether the reported information requires EPA action to protect human health and/or the environment. Further action may include suspending, or revoking the exclusion, or other appropriate response necessary to protect human health and the environment.

(D) If the Division Director determines that the reported information does require action, he will notify the facility in writing of the actions the Division Director believes are necessary to protect human health and the environment.

		The notice shall include a statement of the proposed action and a statement providing the facility with an opportunity to present information as to why the proposed action by EPA is not necessary. The facility shall have 10 days from the date of the Division Director's notice to present such information. (E) Following the receipt of information from the facility described in paragraph (6)(D) or if no information is presented under paragraph (6)(D), the Division Director will issue a final written determination describing the actions that are necessary to protect human health and/or the environment. Any required action described in the Division Director's determination shall become effective immediately, unless the Division Director provides otherwise. (7) Notification Requirements: **Shell** Oil Company must do the following before transporting the delisted waste. Failure to provide this notification will result in a violation of the delisting petition and a possible revocation of the decision. (A) Provide a one-time written notification to any state regulatory agency to which or through which it will transport the delisted waste described above for disposal, 60 days before beginning such activities. (B) Update the one-time written notification if it ships the delisted waste into a different disposal facility. (C) Failure to provide this notification will result in a violation of the delisting exclusion and a possible revocation of the decision.
Eastman Chemical Company.	Longview, Texas	Wastewater treatment sludge, (at a maximum generation of 82,100 cubic yards per calendar year) generated by **Eastman** (EPA Hazardous Waste Nos. F001, F002, F003, F005 generated at **Eastman** when disposed of in a Subtitle D landfill. **Eastman** must implement a testing program that meets the following conditions for the exclusion to be valid: (1) Delisting Levels: All concentrations for the following constituents must not exceed the following levels (mg/l). For the wastewater treatment sludge constituents must be measured

in the waste leachate by the method specified in 40 CFR 261.24. Wastewater treatment sludge:

(i) Inorganic Constituents: Antimony-0.0515; Barium-7.30; Cobalt-2.25; Chromium-5.0; Lead-5.0; Mercury-0.0015; Nickel-2.83; Selenium-0.22; Silver-0.384; Vanadium-2.11; Zinc-28.0

(ii) Organic Constituents: Acenaphthene-1.25; Acetone--7.13; bis(2-ethylhexylphthalate--0.28; 2-butanone--42.8; Chloroform--0.0099; Fluorene--0.55; Methanol-35.7; Methylene Chloride--0.486; naphthalene-0.0321.

(2) Waste Holding and Handling: If the concentrations of the sludge exceed the levels provided in Condition 1, then the sludge must be treated in the Fluidized Bed Incinerator (FBI) and meet the requirements of that September 25, 1996 delisting exclusion to be non-hazardous (as FBI ash). If the sludge meets the delisting levels provided in Condition 1, then it's non-hazardous (as sludge). If the waste water treatment sludge is not managed in the manner above, **Eastman** must manage it in accordance with applicable RCRA Subtitle C requirements. If the levels of constituents measured in the samples of the waste water treatment sludge do not exceed the levels set forth in Condition (1), then the waste is nonhazardous and may be managed and disposed of in accordance with all applicable solid waste regulations. During the verification period, **Eastman** must manage the waste in the FBI incinerator prior to disposal.

(3) Verification Testing Requirements: **Eastman** must perform sample collection and analyses, including quality control procedures, using appropriate methods. As applicable to the method-defined parameters of concern, analyses requiring the use of SW-846 methods incorporated by reference in 40 CFR 260.11 must be used without substitution. As applicable, the SW-846 methods might include Methods 0010, 0011, 0020, 0023A, 0030, 0031, 0040, 0050, 0051, 0060, 0061, 1010A, 1020B, 1110A, 1310B, 1311, 1312, 1320, 1330A, 9010C, 9012B, 9040C, 9045D, 9060A, 9070A (uses EPA Method 1664, Rev. A), 9071B, and 9095B. After completion of the initial verification period, **Eastman** may replace the testing required in Condition (3)(A) with the testing required in Condition (3)(B). **Eastman** must continue to test as specified in Condition (3)(A) until and unless notified by EPA in writing that testing in Condition (3)(A) may be replaced by Condition (3)(B).

(A) Initial Verification Testing: At quarterly intervals for one year after the final exclusion is granted, **Eastman** must collect and analyze composites of the wastewater treatment sludge for constituents listed in Condition (1).

(B) Subsequent Verification Testing: Following termination of the quarterly testing, **Eastman** must continue to test a representative

Next Part>>

composite sample for all constituents listed in Condition (1) on an annual basis (no later than twelve months after the final exclusion).

(4) Changes in Operating Conditions. If **Eastman** significantly changes the process which generate(s) the waste(s) and which may or could affect the composition or type of waste(s) generated as established under Condition (1) (by illustration, but not limitation, change in equipment or operating conditions of the treatment process or generation of volumes in excess 82,100 cubic yards of waste annually), **Eastman** must (A) notify the EPA in writing of the change and (B) may no longer handle or manage the waste generated from the new process as nonhazardous until **Eastman** has demonstrated through testing the waste meets the delisting levels set in Condition (1) and (C) **Eastman** has received written approval to begin managing the wastes as non-hazardous from EPA.

(5) Data Submittals. **Eastman** must submit or maintain, as applicable, the information described below. If **Eastman** fails to submit the required data within the specified time or maintain the required records on-site for the specified time, EPA, at its discretion, will consider this sufficient basis to reopen the exclusion as described in Condition (6). **Eastman** must:

(A) Submit the data obtained through Condition (3) to Mr. William Gallagher, Chief, Region 6 Delisting Program, EPA, 1445 Ross Avenue, Dallas, Texas 75202-2733, Mail Code, (6PD-O) within the time specified.

(B) Compile records of operating conditions and analytical data from Condition (3), summarized, and maintained on-site for a minimum of five years.

(C) Furnish these records and data when EPA or the State of Texas request them for inspection.

(D) Send along with all data a signed copy of the following certification statement, to attest to the truth and accuracy of the data submitted:

(i) Under civil and criminal penalty of law for the making or submission of false or fraudulent statements or representations (pursuant to the applicable provisions of the Federal Code, which include, but may not be limited to, 18 U.S.C. 1001 and 42 U.S.C. 6928), I certify that the information contained in or accompanying this document is true, accurate and complete.

(ii) As to the (those) identified section(s) of this document for which I cannot personally verify its (their) truth and accuracy, I certify as the company official having supervisory responsibility for the persons who, acting under my direct instructions, made the verification that this information is true, accurate and complete.

(iii) If any of this information is determined by EPA in its sole discretion to be false, inaccurate or incomplete, and upon conveyance of this fact to the company, I recognize and agree that this exclusion of waste will be void as if it never had effect or to the extent directed by EPA and that the company will be liable for any actions taken in contravention of the company's RCRA and CERCLA obligations premised upon the company's reliance on the void exclusion.

(6) Reopener Language:

(A) If, anytime after disposal of the delisted waste, **Eastman** possesses or is otherwise made aware of any environmental data (including but not limited to leachate data or groundwater monitoring data) or any other data relevant to the delisted waste indicating that any constituent identified for the delisting verification testing is at level higher than the delisting level allowed by the Regional Administrator or his delegate in granting the petition, then the facility must report the data, in writing, to the Regional Administrator or his delegate within 10 days of first possessing or being made aware of that data.

(B) If the annual testing of the waste does not meet the delisting requirements in Condition (1), **Eastman** must report the data, in writing, to the Regional Administrator or his delegate within 10 days of first possessing or being made aware of that data.

(C) If **Eastman** fails to submit the information described in Conditions (5), (6)(A) or (6)(B) or if any other information is received from any source, the Regional Administrator or his delegate will make a preliminary determination as to whether the reported information requires Agency action to protect human health or the environment. Further action may include suspending, or revoking the exclusion, or other appropriate response necessary to protect human health and the environment.

(D) If the Regional Administrator or his delegate determines that the reported information does require Agency action, the Regional Administrator or his delegate will notify the facility in writing of the actions **the Regional Administrator** or his delegate believes are necessary to protect human health and the environment. The notice shall include a statement of the proposed action and a statement providing the facility with an opportunity to present information as to why the proposed Agency action is not necessary. The facility shall have 10 days from the date of the Regional Administrator or his delegate's notice to present such information.

(E) Following the receipt of information from the facility described in Condition (6)(D) or (if no information is presented under Condition (6)(D)) the initial receipt of information described in Conditions (5), (6)(A) or (6)(B), the Regional Administrator or his delegate will issue a final written determination describing the Agency actions that are necessary to protect human health or the environment. Any required action described in the Regional Administrator or his delegate's determination shall become effective immediately, unless the Regional Administrator or his delegate provides otherwise.

(7) Notification Requirements. **Eastman** must do following before transporting the delisted waste off-site: Failure to provide this notification will result in a violation of the delisting petition and a possible revocation of the exclusion.

(A) Provide a one-time written notification to any State Regulatory Agency to which or through which they will transport the delisted waste described above for disposal, 60 days before beginning such activities.

(B) Update the one-time written notification if they ship the delisted waste into a different disposal facility.

Exhibit 5

Hazardous Waste Delisting Petition

Shell Oil Company

Deer Park, Texas

January 20, 2003

Volume 1 of 2

Shell Deer Park Refining Company
A Division of Shell Oil Products Company LLC

P. O. Box 100
Deer Park, TX 77536

January 21, 2003

CERTIFIED MAIL - RETURN RECEIPT REQUESTED
#7002 0860 0005 5019 4724

Mr. Darrin Swartz-Larson
Chief OK/TX RCRA Permits Section
U.S. Environmental Protection Agency
Multimedia Planning & Permitting Division (6PD-O)
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Subject: Delisting Petition for the MTR Landfill Leachate
EPA I.D. TXD067285973
Shell Oil Company
Deer Park, Texas

Dear Mr. Swartz-Larson:

Shell Deer Park Refining Company, on behalf of Shell Oil Company (Shell), is pleased to submit one hard copy and one electronic copy of the Delisting Petition for the MTR Landfill Leachate. This petition is submitted in accordance with Region 6 RCRA Delisting Guidance Manual for the Petitioner. It is Shell's understanding that the EPA will acknowledge receipt of this petition by letter within five (5) days of receipt of this petition. Shell will, within seven (7) days of receipt of the EPA's letter, submit a public notice to the local newspaper regarding the submittal of the delisting petition to the EPA and will provide a copy to all persons on our facility mailing list. Shell will also send the EPA verification of this action (to be inserted in **Appendix B** of the Delisting Petition) within two (2) days of the publication of the public notice in the newspaper.

We are sending the Texas Commission on Environmental Quality one copy of the Delisting Petition and will have one copy available in the Deer Park public library for public viewing. Please do not hesitate to contact Joe Phillips at (713) 246-1229 if you have any questions or concerns with this submittal.

Sincerely,

Glenn E. Gibler

Glenn E. Gibler
Manager, Environmental & Compliance Assurance
Deer Park Refining Services
Agent for Shell Deer Park Refining Company

Enclosures

cc: **CERTIFIED MAIL - RETURN RECEIPT REQUESTED**
#7002 0860 0005 5019 4717

Registration and Reporting Section, MC-129
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

HAZARDOUS WASTE DELISTING PETITION

FOR

SHELL OIL COMPANY

DEER PARK, TEXAS

VOLUME 1 OF 2

JANUARY 20, 2003

Prepared by:
Elizabeth Arceneaux, P.E., DEE
113 N. Johnson
San Marcos, Texas 78666
(512) 353-4720

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

Elizabeth Arceneaux, P.E. was retained by Shell Oil Company in Deer Park, Texas (Shell) to prepare a Hazardous Waste Delisting Petition (HWDP) for one waste stream currently generated at the facility. This HWDP was developed in accordance with the EPA Region 6 Hazardous Waste Delisting Program requirements.

1.1 OBJECTIVES

The objective of this HWDP is to provide documentation necessary for EPA to use in determining eligibility for delisting the petitioned waste. This petition contains information specified by EPA's guidance document titled: *Region 6 RCRA Delisting Program Guidance Manual for the Petitioner.* This information was collected from Shell documentation and from data collected as a result of implementation of the Sampling and Analysis Plan (SAP) developed for the facility and approved by EPA on May 31, 2002.

2.0 Administrative Information Summary

2.1 Name and Address of Petitioner

The complete name and address of the facility submitting this petition is as follows:

Mailing Address
Shell Oil Company
P.O. Box 100
Deer Park, Texas 77536-0100

Site Address
Shell Oil Company
5900 Hwy 225 East
Deer Park, Texas 77536

EPA Identification Number: TXD067285973

A site location map for the facility is presented as **Figure 2-1.**

2.2 Facility Contact Information

The following individual should be contacted for additional information relating to this petition:

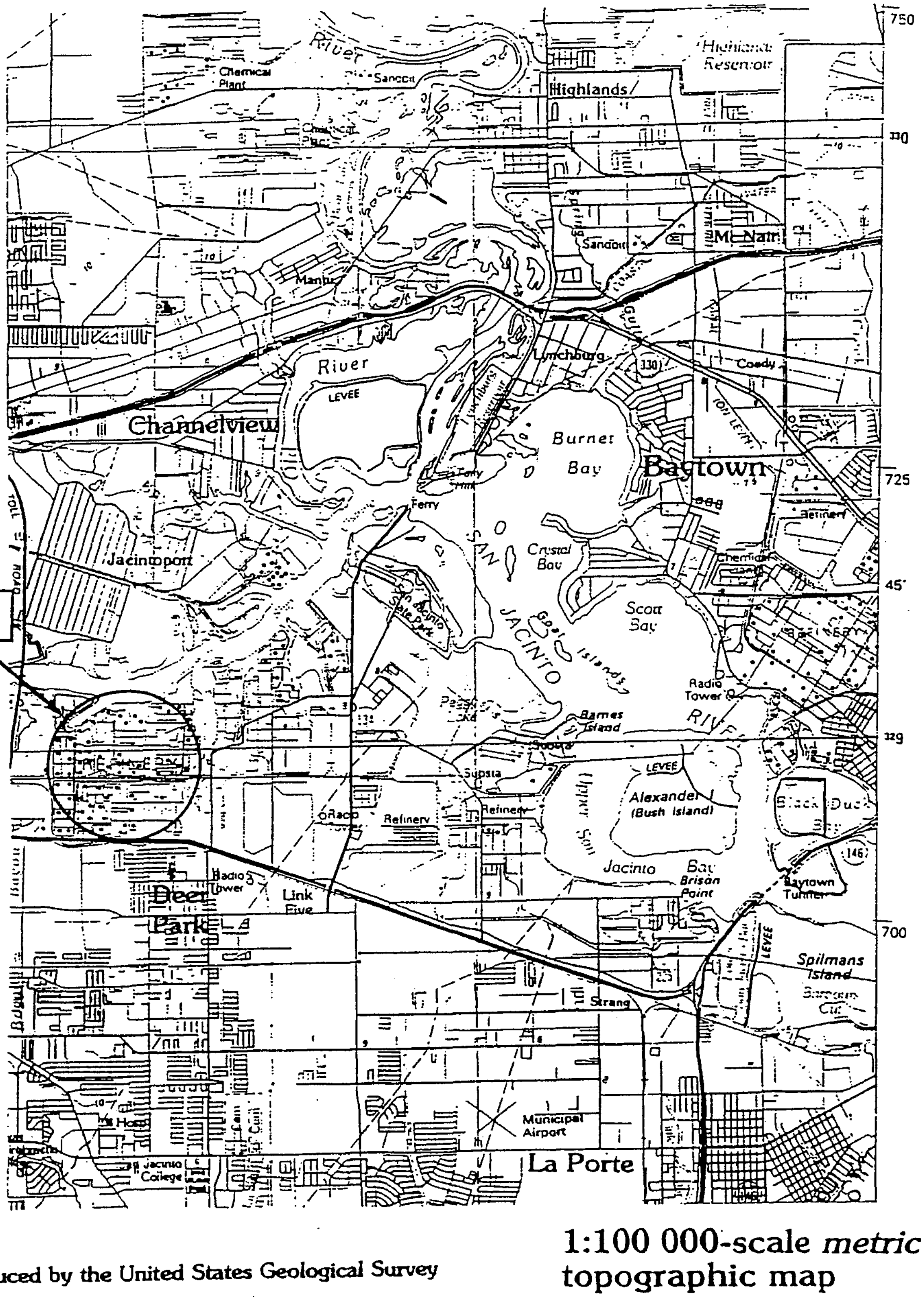
Mr. Joe Phillips
Environmental Specialist
Shell Oil Company
P.O. Box 100
Deer Park, Texas 77536-0100
Phone: (713) 246-1229

2.3 Location of Petitioned Waste

Shell Oil Company
5900 Hwy 225 East
Deer Park, Texas 77536

2.4 Description of Proposed Action

Shell operates a refinery and chemical-manufacturing complex in Deer Park, Texas. Products manufactured include gasolines, fuel oils, lubricants, base chemicals, specialty chemicals and sulfur. Facilities include refinery and chemical process units, feed/intermediate product storage tanks, dock/rail/truck shipping facilities and maintenance



DATE 2002	W.O.NO. 005-01

Figure 2-1
Site Location Map
Shell Oil Company
Deer Park, Texas

facilities. Shell generates hazardous and nonhazardous industrial solid wastes as a result of refinery and chemical processes, wastewater treatment, refinery/chemical plant feed, product storage and distribution.

Some of the hazardous and nonhazardous solid wastes are disposed of in an onsite, permitted hazardous waste landfill (MTR Landfill – Site 104). Leachate from this landfill requires offsite disposal as an F039 (multisource leachate) listed waste. However, analytical data collected monthly for this aqueous stream shows that it is not a characteristic waste and contains little to no detectable concentrations of organic constituents. Therefore, Shell is interested in seeking a conditional exclusion for the landfill leachate in accordance with §40CFR260.20, §260.22 and "EPA Region 6 RCRA Delisting Program Guidance Manual for the Petitioner."

2.5 STATEMENT OF INTEREST IN PROPOSED ACTION

Based on comprehensive chemical analyses performed on samples collected, this waste does not exhibit the characteristics of a hazardous waste and does not meet the criteria for which it was listed.

Once delisted Shell plans to treat the leachate in the refinery's North Effluent Treater (NET) authorized under the National Pollutant Discharge Elimination Systems (NPEDS) program. The leachate will be treated onsite and discharged rather than sent offsite for disposal at a permitted commercial facility.

2.6 JUSTIFICATION FOR DELISTING

Shell has performed extensive testing of the petitioned waste stream by undertaking a comprehensive sampling and analysis program. EPA was involved in developing the SAP and approved its use on May 31, 2002. Eight samples were collected of the waste (four primary and four secondary) and analyzed for a complete suite of parameters specified by the SAP. The waste was not found to be characteristically hazardous. A copy of the Quality Assurance Report for this project is included as Appendix A.

Using Region 6 Delisting Risk Assessment Software (DRAS), the analytical results also show that the waste does not contain levels of hazardous or nonhazardous constituents that would pose a significant risk to human health or the environment. The DRAS program evaluated a scenario assuming that the leachate were treated in a surface impoundment such as the NET onsite.

2.7 CERTIFICATION STATEMENT

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining information, I believe that the submitted information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including possibility of a fine and imprisonment.

Signed,

Dean Eshelman
Dean Eshelman
Plant Manager
Shell Chemical Company, Deer Park, Texas

Tim Hake
President and CEO
Shell Deer Park Refining Company

Madonna V. Porter
Notary for Harris County

MADONNA V. PORTER
MY COMMISSION EXPIRES
October 27, 2005

2.8 PUBLICATION OF NOTICE

A copy of the publication of notice regarding submittal of this petition is included in Appendix B.

3.0 WASTE AND WASTE MANAGEMENT HISTORY INFORMATION

3.1 DESCRIPTION OF PETITIONED WASTE

This plan covers a waste stream described as *MTR Landfill Leachate*. The F039 listing is for a multisource leachate. The leachate is a dark colored liquid and is collected from the primary and secondary leachate collection systems underlying the MTR hazardous waste landfill.

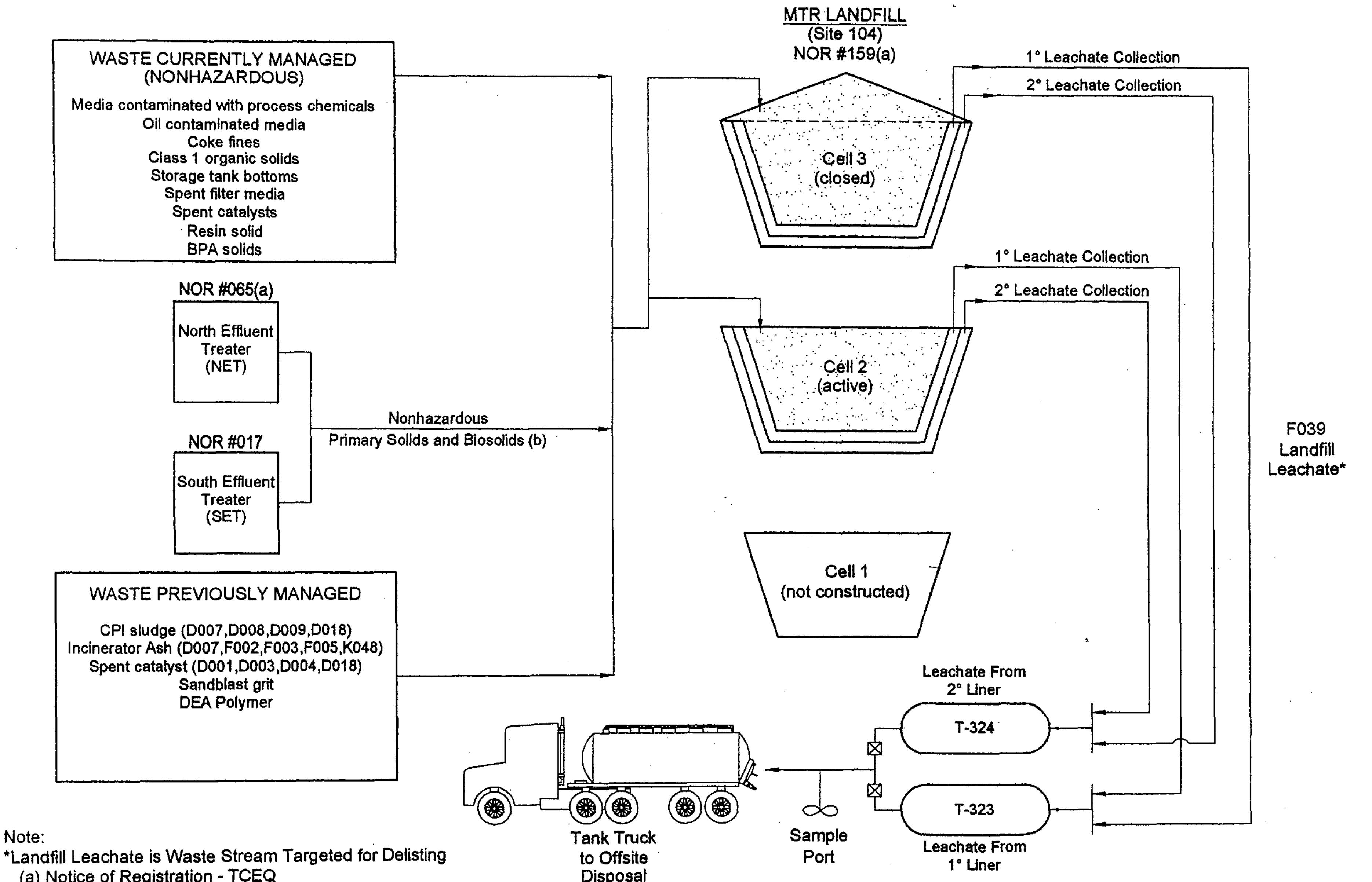
Figure 3-1 provides a basic schematic of waste input and operation of the MTR Landfill. The landfill occupies an area of approximately 17 acres and is being constructed in three stages, one cell at a time. Cell 3 was constructed in 1990 and closed in 1995. Cell 2 was constructed in 1995 and is currently active and receiving primarily nonhazardous solid wastes. Currently, there are no plans to construct Cell 1. The entire landfill is scheduled for closure by 2007.

As shown, the landfill has both a primary and secondary liner with a leachate collection system for both. The leachate is pumped from the collection systems to two hazardous waste storage tanks for the storage (<90-day) of primary leachate (tank T-323) and secondary leachate (tank T-324). The leachate has been combined in tanker trucks and disposed of as F039 listed waste at an offsite, permitted TSD facility.

The Texas Commission on Environmental Quality (TCEQ) has recently granted Shell permission to discharge the leachate into the Houston Ship Channel via NPDES permitted outfall R-007. The TCEQ granted this permission based on Shell's intention to have the leachate delisted, and it will be rescinded once the delisting process is complete.

3.2 HISTORY OF WASTE GENERATION

The MTR landfill began generating leachate around 1995 (Cell 3); however, the volume has increased substantially over the past 3-5 years. The leachate is transported offsite for disposal at an offsite permitted TSD facility on a monthly basis. The volume of leachate



Note:
*Landfill Leachate is Waste Stream Targeted for Delisting
(a) Notice of Registration - TCEQ
(b) Predominant Waste Stream Managed in MTR Landfill

DATE: October 2002	FILE NAME: Figure1-1.dwg	WORK ORDER NO.: 005-01

Figure 3-1
Simplified Process Flow Diagram - Landfill Leachate
Shell Oil Company
Deer Park, Texas

generated from 1999 to 2001 is shown below:

Year	tons/year (a)
1999	3,836
2000	9,237
2001	9,306
Annual Avg.	7,460
Annual Max.	9,306
Annual Max. assuming a 50% increase	14,000

(a) Based on Annual Waste Summary Reports submitted to the Texas Natural Resource Conservation Commission (TCEQ)

The annual maximum amount generated (as of 2001) is 9,206 tons. Shell would like to delist a volume 50% higher than this value to allow for future additional waste generation. The requested amount to delist in this petition is 14,000 tons (annual maximum). This is equivalent to 16,619 cy/year using the density of water (62.4 pounds/cf) to convert.

3.3 WASTE MANAGEMENT HISTORY

The landfill leachate is removed by vacuum truck from Tanks 323 and 324 on a monthly basis. The following hazardous waste disposal facilities have been used for offsite disposal of the leachate since 1998:

Texas Molecular (formerly Disposal Systems Inc.)
TXD000719518
2525 Battleground Road
Deer Park, Texas 77536
Deepwell injection

Laidlaw Environmental
TXD055141378
2027 Battleground Rd
Deer Park, TX 77536
Hazardous waste incineration

Chemical Waste Management
TXD000838896
Hwy 73, 3 miles west of Taylor Bayou
P.O. Box 2563
Port Arthur, TX 77643
Incineration and Deepwell injection

Duratherm, Inc.
TXD981053770
2700 Ave. S.
San Leon, Texas 77539
Hazardous waste fuel blending and recycling

If the leachate is delisted, Shell will make piping modifications to allow the leachate to be routed to the North Effluent Treater for treatment. The treated effluent is discharged through an NPDES permitted outfall (Permit: TX0004871, Texas permit #00403).

4.0 PROCESS AND WASTE MANAGEMENT HISTORY INFORMATION

4.1 GENERAL OPERATIONS AT THE GENERATING FACILITY

Table 4-1 provides a list of the raw products and refined products used and produced at this refinery. Shell Oil Company refines high sulfur crude oil from Mexico to products including gasoline, kerosene, jet fuel, fuel oil, lube oil and others. The facility occupies approximately 1600 acres in an industrial area on the south bank of the Houston Ship Channel. The Shell refinery portion of the facility is located generally north of the railroad tracks that cross the facility in an east/west direction.

The refinery consists of distillation, coking, cracking, reforming, hydrotreating and other production units. The production units and their design and production capacity are shown in **Table 4-2.**

4.2 OVERVIEW OF CONTRIBUTING MANUFACTURING PROCESSES

There were very few hazardous wastes managed in the MTR landfill. The hazardous wastes included incinerator ash, spent catalysts and filters, CPI sludge from the refinery wastewater treatment plant (North Effluent Treater) and primary solids from Shell Chemical and the South Effluent Treater (SET). The wastes disposed of in the MTR landfill for the past four years have been Class 1 and Class 2 nonhazardous wastes (**Table 4-3**). The following sections describe the contributing processes that generate the predominant hazardous and nonhazardous waste streams managed in the MTR landfill.

4.2.1 Incinerator Operations (Generates Incinerator Ash)

Shell once operated an incinerator to destroy biosolids sludge from both the refinery and chemical wastewater treatment plants. The waste ash carried the listing D007, F002, F003, F005, K048. Although there are no laboratory analyses available for the ash, **Table 4-4** shows the constituents that formed the basis for listing the EPA codes. It is unlikely that the ash contained organic constituents, due to their destruction in the incinerator.

TABLE 4-1

Raw Materials, Intermediates, and Products
Shell Oil Company
Deer Park, Texas

Parameter	*CAS Number*
Raw Materials	
Crude Oil	8002-05-9
Major Intermediates	
Intermediates are consistent with refinery operations.	
Products	
MTBE	1634-04-4
Unleaded Gasoline	Mixture
Butane/Butylene	106-97-8
	68477-42-9
Domestic Jet Fuel	8008-20-6
Kerosene, Stove, Etc.	8008-20-6
Waxes	64742-61-6
	63231-60-7
Distillate Fuel Oil	68334-30-5
Residual Fuel Oil	68476-33-5
Motor and other Lube Oils	64742-54-7
	64742-18-3
Process Oils (Lubes)	64742-53-6
	64742-52-5
Isobutane and other Light Process Stocks	75-28-5
Natural Gasoline	8006-61-9
Sulfur	7704-34-9
Asphaltic Products	Mixture
Propane	74-98-61
Coke	64741-79-3

TABLE 4-2

Production Units and Capacities
Shell Oil Company
Deer Park, Texas

Production Unit	***Production Capacity (in MB/SD) (a)***	***Design Capacity (in MB/SD)***
Lube Crude Distillation	70.0	70.0
General Crude Distillation	204.5	210.0
Vacuum Distillation	104.5	115.0
	25.0	14.0
	9.5	25.0
Delayed Coking	65.0	65.0
Catalytic cracking	67.0	70.0
Reforming:		
Semi-Regen	24.5	27.0
Cyclic	47.0	47.3
Hydrocracking	67.0	68.5
Hydrotreating:		
Naphtha	65.0	65.0
Kerosene	37.0	37.0
Distillate	35.0	35.0
Cat Feed	45.0	49.5
Other	41.0	44.0
Lube	12.0	13.5
Alkylation (H_2SO_4)	16.8	17.2
Methyl tert-butyl ether	5.7	5.7
Asphalt	4.7	4.7
Hydrogen:		
Steam/Methane Reformer	65.0	70.0
Pressure Swing Absorber	38.0	38.0
Coke (metric tons/day, 8% water)	4,122	4,122
Lube Processes:		
Deasphalting	4.2	4.2
Solvent Extraction	13.0	13.0
MEK Dewaxing	7.5	10.0
Deoiling (WAX)	2.4	2.4

NOTE: (a) MB/SD (thousand barrels per stream day) is capacity of unit on sustained basis

TABLE 4-3
Volume of Waste Disposed of in MTR Landfill (a)
Shell Oil Company
Deer Park, Texas

Waste Type	*TCEQ Waste Code*	*1998 Tons*	*1999 Tons*	*2000 Tons*	*2001 Tons*
DEA Polymer	00034031	25	0	0	0
Nonhazardous Resin Solid	01034031	655	1025	1066	0
BPA Solids	02014031	30	21.5	34	0
Chemical Primary Solids	03085031	9694	38	0	0
Biosolids – Refinery and Chemical Class 2	03056072	4479	0	0	0
Biological Treatment Sludge (organic)	03146071	0	1544	0	0
Sandblast Grit	07013891	232	86	0	0
Chemical Contaminated Media	60033011	1249	741	478	0
Oil Contaminated Media	70023011	2032	1769	1351	370
Nonhazardous Catalyst	80053931	3256	573	310	1
Nonhazardous Tank Bottoms	80103191	97	78	0	0
Nonhazardous Filter Media	80123101	170	105	66	0
Coke Fines	80264891	101	354	0	0
Class 1 Organic Solids	80294091	218	570	27	50
Plant Trash	80203191	0	0	50	0
TOTAL		**22, 238**	**6,904**	**3,382**	**421**

NOTES:
(a) Based on Annual Waste Summary Reports

TABLE 4-4

Potential Constituents in Incinerator Ash
Shell Oil Company
Deer Park, Texas

Basis for Listing (a)
D007
• Chromium
F002
• Tetrachloroethylene
• Methylene chloride
• Trichloroethylene
• 1,1,1-Trichloroethane
• 1,1,2-Trichloroethane
• Chlorobenzene
• Ortho-dichlorobenzene
• Trichlorofluoromethane
F003
• N.A.
F005
• Toluene
• Methyl ethyl ketone
• Carbon disulfide
• Isobutanol
• Pyridine
• 2-ethyoxyethanol
• Benzene
• 2-nitropropane
K048
• Hexavalent chromium
• Lead

NOTE: (a) 40CFR261, Appendix VII

4.2.2 Maintenance Activities (for spent catalysts, filters)

Many of the refinery processes use catalysts to facilitate the process and simplify the hardware. Depending upon the process unit, spent catalyst are either hazardous or nonhazardous. Hazardous spent catalyst is generally a listed waste from refining hydrotreating processes. Nonhazardous spent catalyst generally is from the Catalytic Cracking Unit (CCU).

Spent catalyst from the various hydrotreater units is generated during routine maintenance shut-downs (turn-arounds). A turn-around usually occurs every two years at the Shell Deer Park Refinery. The hazardous spent catalyst is usually sent off site for regeneration or disposal.

Spent catalyst from the CCU is generated as part of the process itself. New catalyst is inserted into the CCU on a daily basis with spent catalyst generated at the same rate. The spent catalyst is accumulated in hoppers and is disposed of every two weeks. In the past the spent catalyst has been disposed of in the MTR landfill. Currently, it is sent off site for recycling. The spent catalyst generally contains elevated levels of nickel and vanadium.

Nonhazardous filter media is generated during the routine maintenance of the various refinery scrubbers. These filters are used to filter particulates from the various process and scrubber streams throughout the refinery. DEA polymer, bisphenol acetone (BPA) solids, and filter media are all generated as part of the amine regeneration and scrubbing process. Amine solution is circulated through various refinery scrubbers to remove hydrogen sulfide from the process stream.

4.2.3 Refinery Wastewater Treatment Biosolids – Nonhazardous

As shown in **Table 4-3**, biological treatment sludge (biosolids) was disposed of in the landfill in 1999. Historical data for the sludge shows that it was disposed of in the landfill in relatively large quantities in the past. The biosolids are generated at the North Effluent Treater (NET) (unit number 065 on the TCEQ Notice of Registration). **Figure 4-1** illustrates the NET treatment process and points of primary solids (CPI sludge) and biosolids generation.

The process wastewaters treated at the NET originate from refining and lubricant manufacturing units. Waters treated include process wastewaters, ballast waters, and water recovered from the oil recovery system. Stormwater from the Stormwater Impoundment Basin is also treated in the NET.

Five CPI's are located within the Refinery and at the NET. These CPI's provide the primary oil/water/solids separation step. Process waste, ballast water, and water recovered from the oil recovery system are all treated in the CPI's. The CPI discharge combines with stormwater from the Stormwater Impoundment Basin prior to neutralization using caustic and sulfuric acid. The neutralized water flows through an equalization vessel. Discharge of the equalization vessel is influent for the dissolved air flotation (DAF) unit (Intermediate oil/water separation). The DAF effluent is further processed through the biological treatment processes. These processes consist of a trickle filter and/or two activated sludge basins (North Aeration Basin, South Aeration Basin). Effluent from the basins is clarified in two gravity bed clarifiers and deep bed, monomedia, gravity flow filters prior to discharge through outfall R-007.

The biosolids collected off the clarifiers are processed through a thickener and digester to reduce the water and hydrocarbon content. The sludge flows through the thickener (40-foot diameter x 10 foot) with an average retention time of 13 hours. It is then digested in an 850,000-gallon aerobic digester for approximately 24 days. The dewatered sludge is then either disposed of in the MTR landfill, recycled in the refinery's coker unit or sent off site for disposal, depending on the hydrocarbon content. TCLP analyses performed in the past show that the sludge is not a characteristic hazardous waste once it has been processed through the thickener and digester. Recent analyses on the sludge show it is a Class 2 nonhazardous waste.

4.2.4 Resin

Resins are no longer manufactured at the Shell Deer Park Refinery, as that business was sold to a third party. Nonhazardous resin solids were generated at the Resins plant during the cleanup of various spills from either the resin solidification process and/or during the bagging operations. The spilled resin was picked up along with dust, dirt and other media during cleanup of the process area. Resin solids also includes filter sludge, bag dust, pipe clean out and vessel clean out of solidified resin.

4.2.5 Shell Chemical Primary Solids

Chemical primary solids consist of sludge and solids that settle in the API separators in the Shell Chemical Plant. Primary solids, consisting of mainly calcium carbonate, also collect in the primary clarifiers of the South Effluent Treater (SET) (unit number 017 on the NOR). **Figure 4-2** illustrates the SET wastewater treatment process. These solids may have residual oil and resin, but are nonhazardous waste. The SET treats wastewater from the chemical units that produce oxygenated solvents, olefins, resins, vinyl chloride monomer and phenol

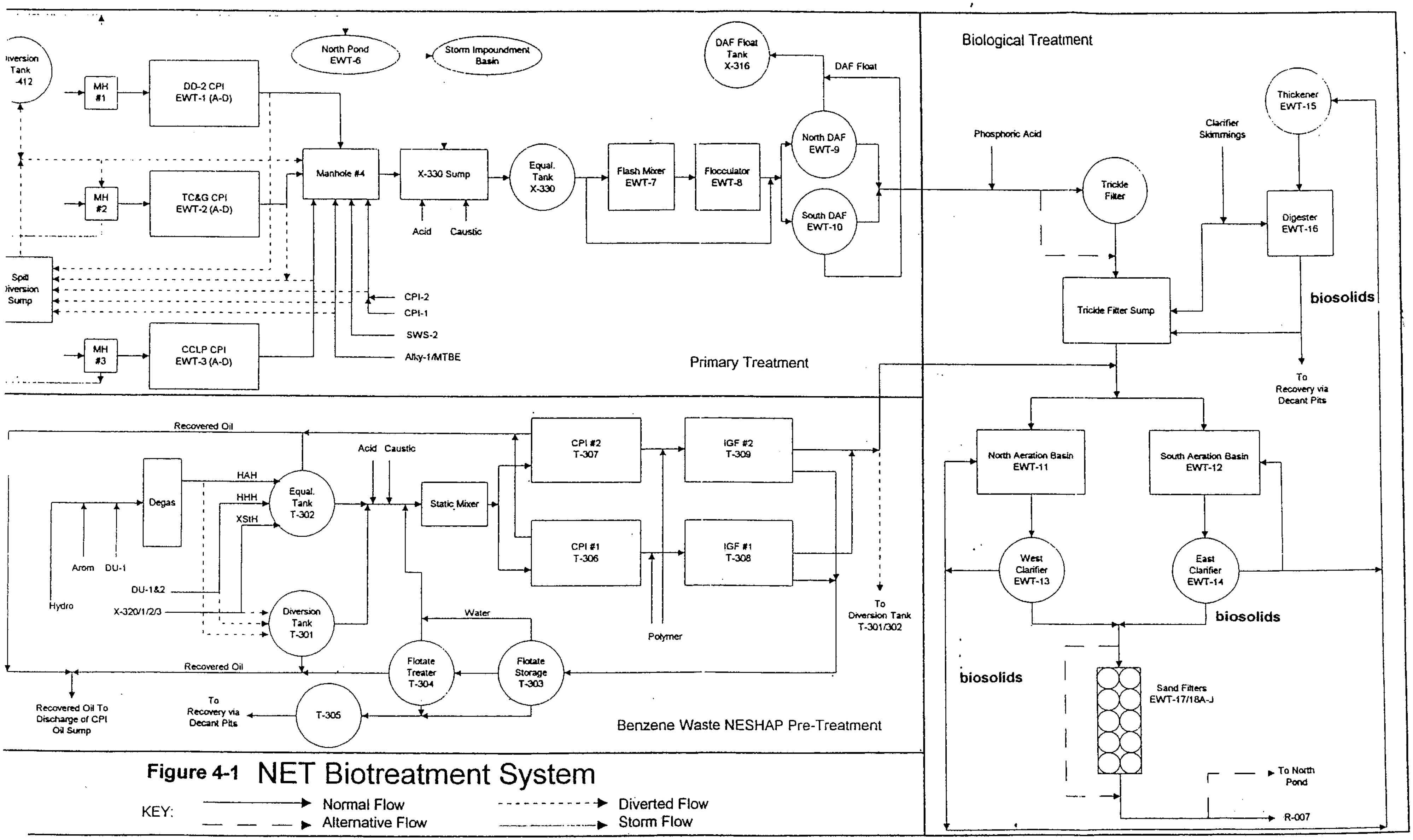
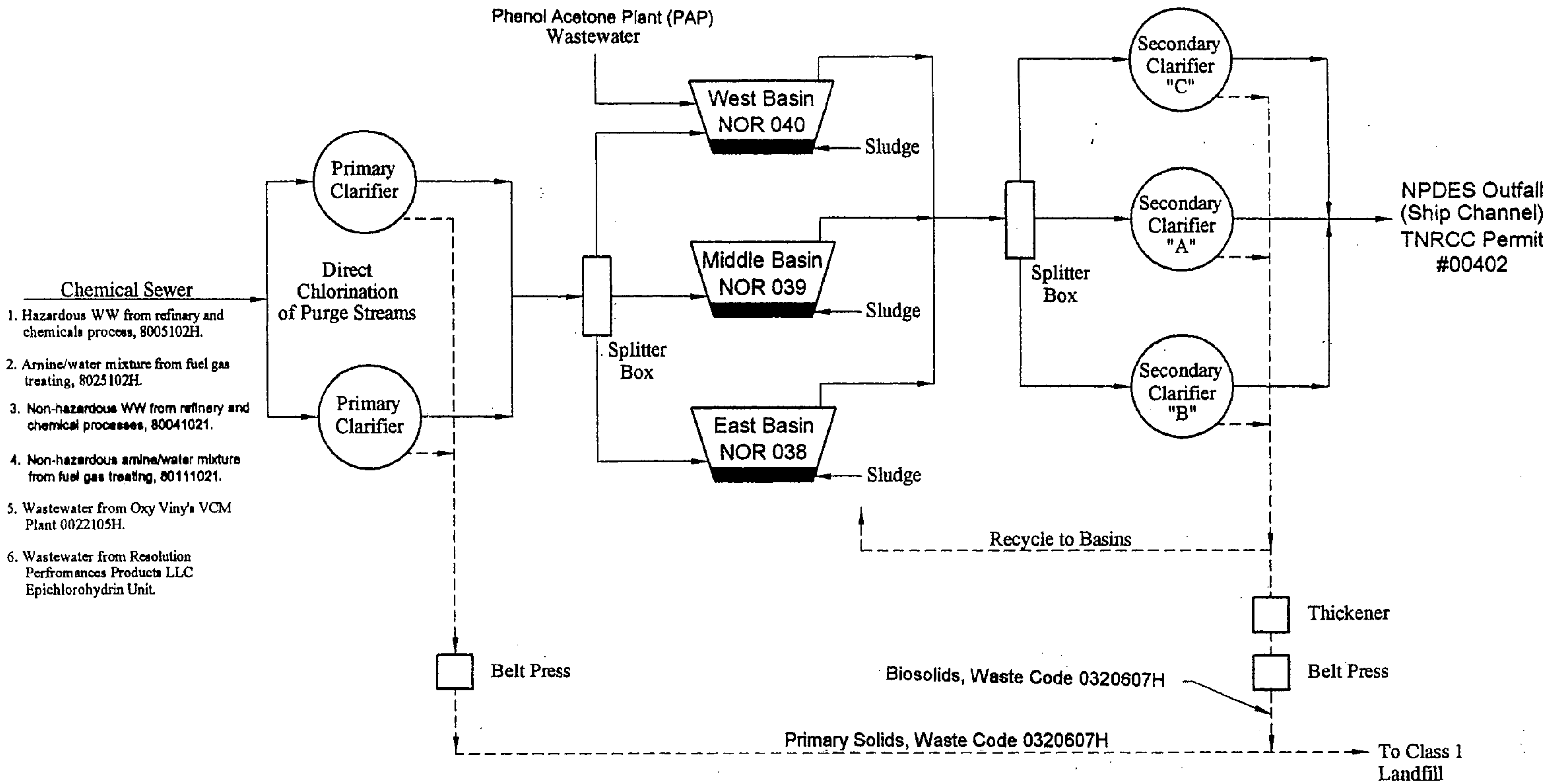


Figure 4-1 NET Biotreatment System



DATE: November 2002	FILE NAME: Figure1.dwg	WORK ORDER NO.: 005-01

FIGURE 4-2
Simplified Process Flow Diagram
South Effluent Treater (SET)
Shell Chemical-Deer Park, Texas

acetone. Chemical analysis of the primary solids (6/23/00) show that the waste is not a characteristic hazardous waste. Because the SET treats a listed wastewater from OxyVinyls (K017, K019, K020), the solids generated from treatment of the chemical wastewater might be considered hazardous due to the derived-from rule. Shell is working with the TCEQ to gain clarification on the regulatory status of these solids. OxyVinyls submitted a delisting petition to EPA on October 11, 2002 to delist the wastewater for these waste codes.

4.2.6 Shell Chemical Biosolids

The biosolids are generated in the east, middle, and west aeration basins of the SET. They consist of biomass and floc that form the aerobic digestion of the chemical wastewater. The solids are separated in the three clarifiers that follow the aeration basins. Excess biosolids are processed through a thickener and filter press and transported off site for disposal. In the past, biosolids were disposed of in the MTR. Chemical analysis of this waste stream in June 2000 showed that the waste is not hazardous due to characteristic and the Total Petroleum Hydrocarbon content was less than 50 mg/kg. The biosolids, like the primary solids, may carry the K017, K019 and K020 listing until either OxyVinyls' wastewater is delisted or regulatory status is determined.

4.2.7 Oil Contaminated Media

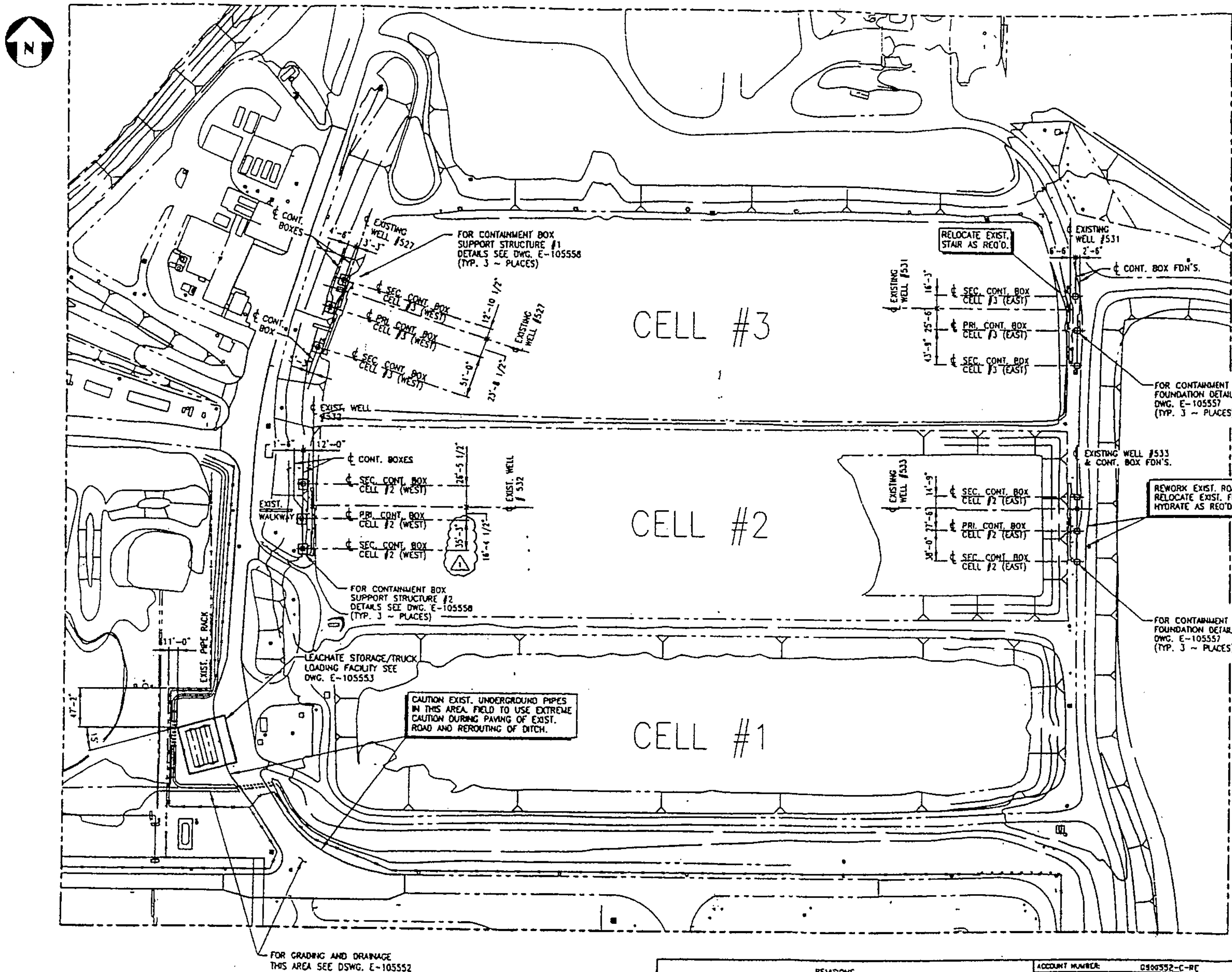
Oil contaminated media includes Class 1 waste consisting of soil from spill cleanups and from construction areas contaminated with oil (TPH). This waste also includes rags, personal protective equipment/clothing and spent absorbents/pads/booms contaminated with nonhazardous oil.

4.3 LANDFILL OPERATION AND LEACHATE COLLECTION SYSTEM

The MTR landfill consists of three cells, a leachate collection system and two less-than-90 days leachate storage tanks. Cell 3 was constructed in November 1990 and capped in 1995. Cell 2 was constructed in September 1995 and is open, and Cell 1 has not been constructed. The landfill is currently scheduled for closure in 2007. **Figure 4-3** shows a plan view of the landfill and the leachate collection and storage system.

4.3.1 Landfill Design

The landfill is designed to meet the minimum technological requirements (MTR) specified in 40CFR264.301. This includes design requirements of a primary leachate collection system and liner (underlying the deposited waste) followed by a secondary leachate



NOTES:

1. FOR GENERAL NOTES SEE DWG. E-105550.

REFERENCE DRAWINGS:

E-105550 CIVIL/STRUCTURAL GENERAL NOTES
E-105552 GRADING AND DRAINAGE PLAN
E-105553 STORAGE/TRUCK LOADING FACILITY FOUNDATION
E-105557 PUMP CONTAINMENT BOX FOUNDATION DETAILS
E-105558 PUMP CONTAINMENT BOX SUPPORT STRUCTURE

STATE OF TEXAS
RUSSELL C. DIONNE
79626
REGISTERED PROFESSIONAL ENGINEER

Russell Dionne

ISSUED FOR
SEP 05 2001
RECORDS

Figure 4-3
Plan View of Landfill and Leachate Collection Tanks

DRAWING CODE: 0283.225.625

DEER PARK MANUFACTURING COMPLEX
SHELL OIL COMPANY – SHELL CHEMICAL COMPANY
DEER PARK REFINING LIMITED PARTNERSHIP

PAVING & FOUNDATION LOCATION PLAN
LEACHATE COLLECTION AND STORAGE SYSTEM
ENVIRONMENTAL N. E. WASTE TREATING AREA

JOB. NO. SOP-00-1678

BEI ENGINEERS

ACCOUNT NUMBER: 0900552-C-RE

NO.	DATE	JOB	REVISIONS	MADE	CHK'D	APP'D
0	3/01	0900552CRE	ISSUED FOR CONSTRUCTION	JH	JAJ	PJA
1	5/01	0900552CRE	CHANGES DIMENSION	BAB	RCB	RCJ

DRAWN: JH. CHECKED: JAJ APPROVED: FDB

ISSUE DATE: 03-05-01 LOC: R

DWG. No. E-105551-01

collection system and liner (underlying the primary liner). **Figure 4-4** shows the components of the primary and secondary leachate/liner systems.

4.3.2 Leachate Collection System Design

This landfill design includes a series of liners and leachate collection systems that envelope the deposited waste to prevent migration of wastes and leachate out of the landfill. Just beneath and in direct contact with the waste is the upper or primary leachate collection system. This system includes (beginning at the top) a three-inch sand layer, a layer of geotextile fabric, and a gravel layer whose thickness varies from 0.5 to 1.5 feet. Two eight-inch perforated leachate collection pipes are located within the gravel layer and are in turn contained in two east-west trenches of each half cell.

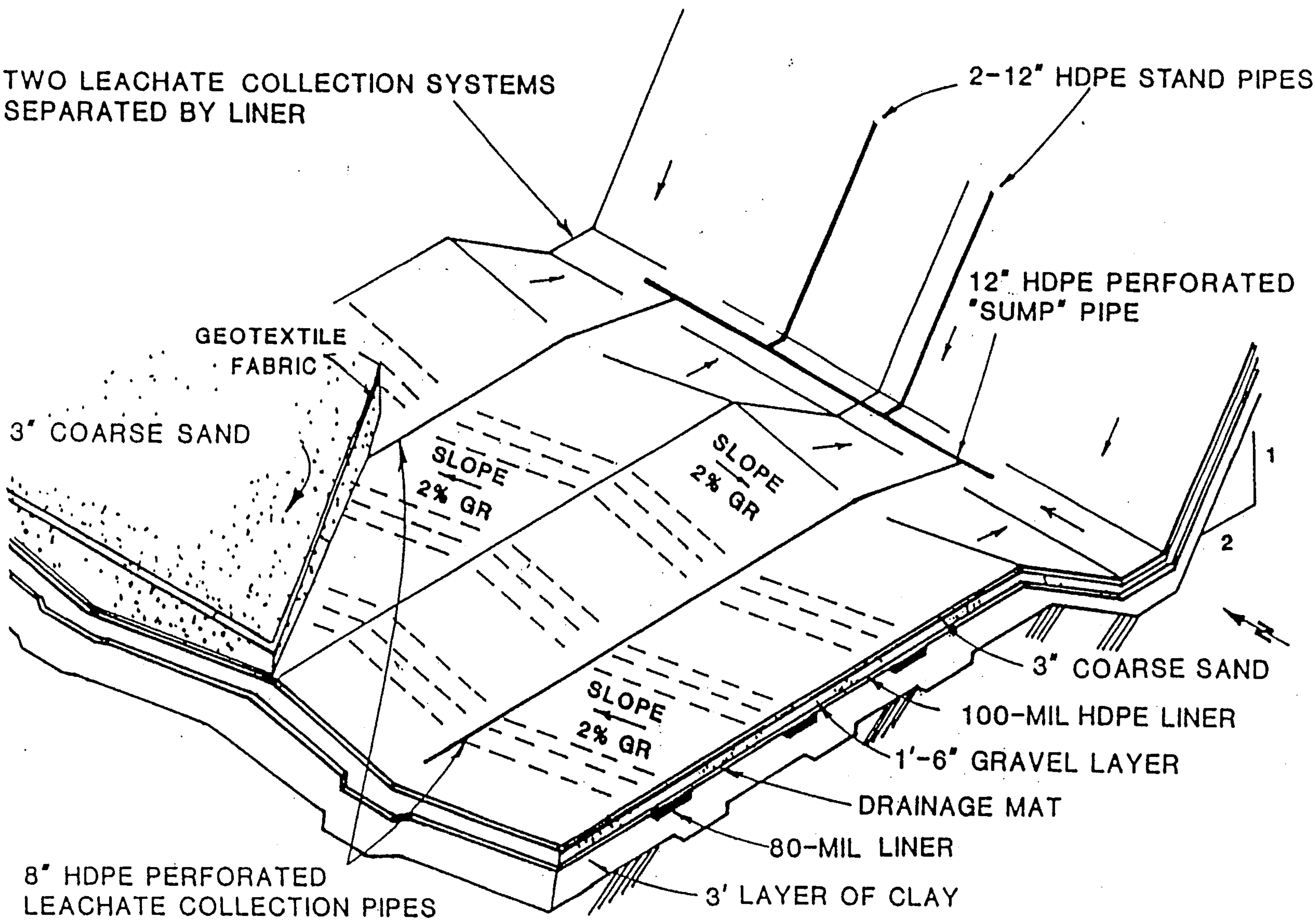
The eight-inch pipes connect on one end of the cell to a 12-inch perforated pipe which is perpendicular to the collection pipes and is contained in a two-foot deep sump at the outer end of each half cell. Each end of the 12-inch headers is capped. Two 12-inch stand pipes, also referred to as well casings, connect to the sump pipe in each half cell. The stand pipes are at right angles to the sump pipe and extend along the 1V:2H slope, following the inner face of the perimeter dike to the top of the landfill. Leachate filters through the sand layer into the gravel layer. The high permeability gravel layer permits the rapid flow of leachate along a two percent slope in a north or south direction, toward the two east-west oriented trenches. The primary leachate collection system components slope from the center dike into a lengthwise direction in each half-cell toward the collection sumps.

The primary liner is immediately below the gravel layer. The primary liner is a single, flexible membrane of 100-mil high-density polyethylene (HPDE) material. This liner follows the same contours and slopes as the primary leachate collection system sand and gravel layers. The primary liner covers the sides and the bottom of the landfill. The purpose of this liner is to contain all leachate so that it can be collected and removed from the landfill.

If leachate penetrates the primary liner, it is collected in the secondary leachate collection system. This system is located immediately below the primary liner and consists of a 250-mil HDPE drainage netting (see **Figure 4-5**). The length of the leak detection system is interrupted at intervals by 6 percent bentonite clay dams to divide the bottom area of the half cell into compartments. In the trenches, each dam is penetrated by one to four leachate collection/test pipes. Each of the four pipes in a trench has a different length and is perforated only at the end position that is between dams. This means that each pipe would

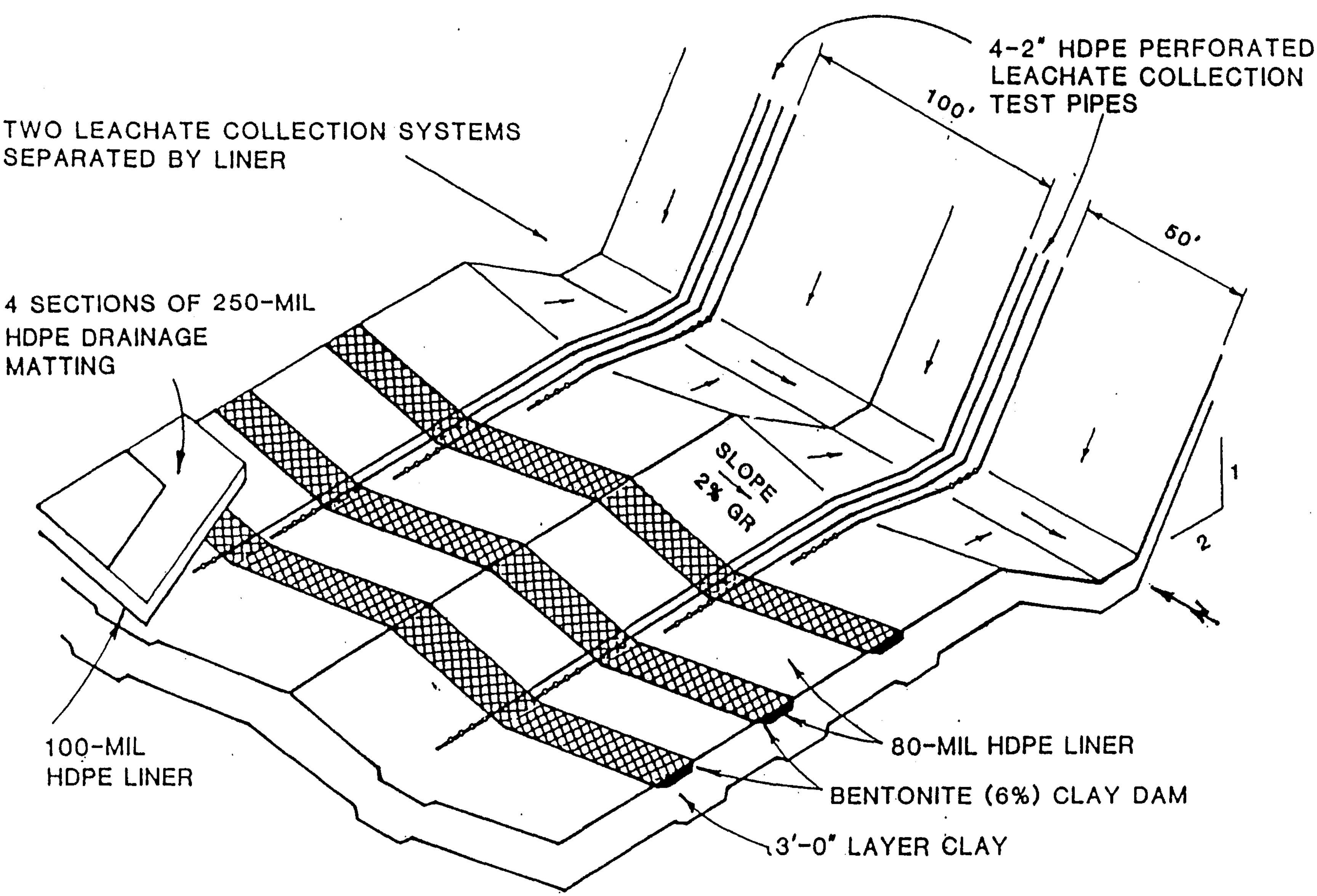
Figure 4-4

Primary and Secondary Leachate Collection Systems
Site 104, MTR Landfill
Isometric View



Fi[illegible]e 4-5

Secondary Leachate Collection Systems
Site 104, MTR Landfill
Isometric View



collect leachate from a single but different compartment. Utilizing this design enables the identification of the area of the primary liner where a leak is indicated. The HDPE drainage mat is designed to allow the rapid flow of leachate to the collection pipes below.

Beneath the drainage mat and collection pipes of the secondary leachate collection is the secondary liner, which is an 80-mil HDPE flexible membrane and a 3-foot thick clay liner. The HDPE liner, like the primary liner, completely covers the bottom of the cell and extends up the side walls of the containment dikes. The flexible membrane liner is in direct contact with and is supported by a three-foot basal clay, low permeability liner (1×10^{-7} cm/sec permeability). This compacted clay soil liner is designed to follow a two percent slope toward the two east-west oriented trenches.

4.3.3 Leachate Collection Storage Tanks/Truck Loading

The storage facility consists of two 1,000-barrel aboveground storage tanks; one for leachate collected from the primary collection system (T-323) and one for the secondary collection system (T-324). The tanks are supported by steel structures placed on a concrete slab. The slab is surrounded by a 3-ft high concrete retaining wall providing secondary containment. A tank truck-loading pad is constructed outside the secondary containment area. The storage facility is equipped with piping, valves, and pumps to load leachate into tank trucks for offsite disposal. The storage tanks are equipped with automated level sensors to detect spills and overfills. The two tanks have valves that allow the trucks to load either from the primary or secondary leachate tanks, or from both simultaneously. A sample port is located between the pump and the loading pipeline to the truck.

4.4 DESCRIPTION OF WASTE MANAGEMENT UNITS

There are 7 hazardous waste treatment and storage units at the refinery. The hazardous waste management units include one hazardous waste landfill (MTR Landfill), three container or dumpster storage areas, one wastewater treatment unit (NET), one waste pile, and one pond (North Pond). The locations of these units (as identified by the NOR number) are shown in **Figure 4-6**. Some of the units are exempt from permitting. The landfill is authorized under the RCRA Permit No. HW-50099-001, issued by the TCEQ and EPA. **Table 4-5** lists the unit, its NOR number and the hazardous waste streams managed in each.

Hazardous wastes generated at the Shell refinery include CPI sludge, DAF solids, primary solids and IGF float from the refinery wastewater treatment plant (i.e., North Effluent

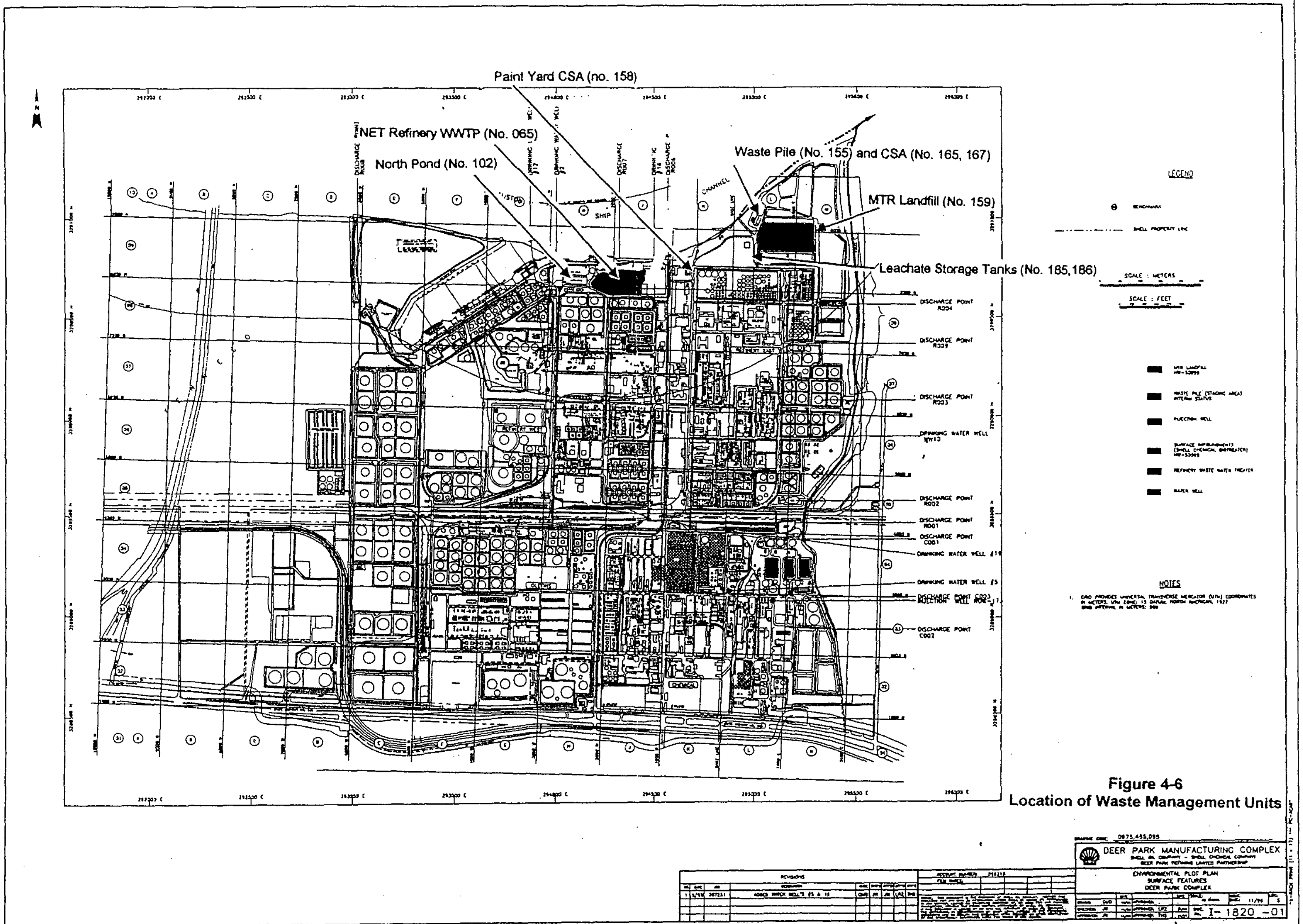


Figure 4-6
Location of Waste Management Units

TABLE 4-5
Hazardous Waste Management Units in the Refinery
Shell Oil Company
Deer Park, Texas

Hazardous Waste Management Unit	*Hazardous Waste Managed*	*TCEQ Waste Code*
NET Refinery WWTP NOR Facility 065 (a)	Groundwater, hazardous	0312102H
	Spent acid solutions	8007104H
	Spent caustic solutions	8008109H
	Hazardous wastewater from refinery and chemical processes	8019102H
	Amine/water mixture from fuelgas treating units	8025102H
	Previously Managed at NET:	
	Refinery biosolids, hazardous	0302607H
	Washwater with residue from combustion of phenol heavy ends	1705114H
	Wastewater contaminated with refinery listed waste	7007102H
Waste Pile NOR Facility 155	All nonhazardous waste	N/A
	Previously Managed at Waste Pile:	
	Amine/water mixture from fuelgas treating units.	8025102H
Container Storage Area-Paint Yard NOR Facility 158	Paint liquid	0704209H
	Paint solid	0705409H
MTR Landfill – Site 104 NOR Facility 159	Nonhazardous waste	N/A
	Previously Managed at MTR:	
	CPI Sludge from refinery effluent treater	0307503H
	Incinerator Ash, hazardous	0311303H
	Catalyst, hazardous, spent	8006393H
	Spent filter media, hazardous	8013310H
	Primary and biosolids from chemical wastewater treatment	0320607H

Table 4-5
(Continued)

Hazardous Waste Management Unit	*Hazardous Waste Managed*	*TCEQ Waste Code*
Container Storage Areas	Paint liquid	0704209H
NOR Facilities 165, 167	Paint solid	0705409H
	Lab packs	0902003H
	Spent acid	0903103H
	Laboratory wastewater	0904105H
	Contaminated soil	1701301H
	Phenol heavy ends	1702208H
	Phenolic liquid wastes	1704208H
	Spent sulfuric acid	5202602H
	Heat exchanger cleaning liquids	7003114H
	Clarified slurry oil storage tank sediment	7006319H
	Catalyst, spent	8006393H
	Spent filter	8013310H
	PCB contaminated media	8016319H
	Filter media	8024404H
	Pyrophoric solids	8032405H
	Tank seals	8038409H
	Misc. listed organics	8017207H
	Heat exchanger solids	7001319H
	Refinery hydrotreater catalyst	7004393H
	Refinery crude oil storage tank solids	7005319H
	Storage tank bottoms solids, hazardous, from refinery and chemical plant storage tanks	8018319H
	Media contaminated with lead	8039319H
	IRU Polymer waste reactivated	0005403H
	Broken fluorescent lightbulbs, containing mercury	0906388H
	Washwater with residue from combustion of phenol heavy ends	1705114H
	Debris contaminated with K022 wastes	1706319H
	Chrome contaminated media	8009319H

Table 4-5
(Continued)

Hazardous Waste Management Unit	*Hazardous Waste Managed*	*TCEQ Waste Code*
	Previously Managed at CSA:	
	Resin Waste	0102219H
	Resin Waste	0104403H
	Corrosive Solids	8031319H
	Incinerator Ash, Hazardous	0311303H
	ECH, liquid	0607207H
	Spent Ni-Cd Batteries	0710309H
	Spent acetonitrile	0001203H
North Pond NOR Facility 102	CPI sludge from refinery BWN (benzene waste NESHAPS) pretreatment unit	0310503H
Leachate Storage Tanks T-323, T-324 Less than 90-day tanks NOR Facilities 185, 186	Landfill leachate	0301116H

Notes:
(a) NOR = TCEQ Notice of Registration, dated 11/5/02

Treater, NET); incinerator ash; spent catalyst; spent filter media; waste paint; lab packs; spent acids and spent caustic solutions.

A list of the hazardous wastes generated at Shell is shown in **Table 4-6** along with the TCEQ and EPA waste codes for each. Wastes that are landfilled onsite currently or in the past are identified with an asterisk.

A list of permits held by Shell Oil follow:

Hazardous Waste:	RCRA permit number HW50099-001
NPDES Permit:	TX0004871
TPDES Permit:	00403
Air Permit:	TX815, H60656F, H60659W

4.5 PROCESS MATERIALS AND WASTE VOLUMES

The primary raw product used in the refining process is a sour crude oil. Nickel and vanadium-based catalysts are also used in the refining process.

The volume of the waste streams sent to the MTR landfill from 1998 through 2001 was shown previously in **Table 4-3**. Oil contaminated media and chemical contaminated media make up a large volume of waste disposed of in the landfill over the past four years. Spent nonhazardous resin and catalyst also make up a large proportion of waste consistently disposed of in the landfill. Biosolids and chemical primary solids were sporadically disposed of in large quantities.

The volume of leachate collected from the primary and secondary containment systems is shown in **Table 4-7** for the past three years. The volume is measured in terms of the combined volumes from Tanks T-323 and T-324. These data were taken from monthly manifest logs and Shell's Annual Waste Summaries submitted to the TCEQ.

As shown the amount of leachate generated and disposed of offsite has increased over the past three years. Shell is currently investigating the source of leakage into the primary and secondary systems. To date the maximum monthly volume generated is approximately 1,277 tons and the annual maximum is 9,306 tons. To allow for an approximate 50% increase in volume, Shell is requesting to delist an annual maximum volume of 14,000 tons.

TABLE 4-6
Hazardous Wastes Generated at Shell Oil Company (a)
Deer Park, Texas

Description	***TCEQ Waste Code (b)***	***EPA Waste Code***
Spent acentonitrile	0001203H	D001, D018, U003
IRU Polymer waste reactivated	0005403H	D001
Landfill leachate from onsite hazardous waste landfill	0301116H	F039
DAF unit float, skim and bottoms from refinery wastewater treater	0303205H	D018, K048
API skimmings from chemical process units' wastewater treater	0304207H	D001, D018, D035
CPI sludge from refinery wastewater treater*	0307503H	D007, D008, D009, D018, F037
IGF float generated from refinery wastewater induced gas floatation units	0309205H	D018, F038
CPI sludge from Refinery BWN pretreatment unit	0310503H	D018, F037
Groundwater, hazardous	0312102H	D018, D028, D043
Biosolids, chemical, hazardous	0316607H	K174
API sludge, chemical, hazardous	0317609H	D018
Paint liquids waste materials	0704209H	D001, D005, D035, F002 F003, F005
Paint solids waste materials	0705409H	D001, D005, D035, F002 F003, F005

TABLE 4-6
(continued)

Description	*TCEQ Waste Code (b)*	*EPA Waste Code*
Lab packs, hazardous, mixed	0902003H	D001, D002, D003, D011, D018, D019, D022, D028, D035, D040, F002, F003, F005
Spent acid containing mercury salts generated during lab testing	0903103H	D001, D002, D009, D011
Mercury salts and contaminated media	0905316H	D009
Broken fluorescent bulbs containing mercury	0906388H	D009
Soil contaminated with listed commercial chemical product	1701301H	U002, U031, U041, U055, U140, U161, U165, U188
Phenol heavy ends (distillation bottoms) generated from the production of phenol and acetone from cumene	1702208H	D001, K022
Phenolic liquid waste from loading, drips and spills	1704208H	U188
Washwater with residue from combustion of phenol heavy ends	1705114H	D002, K022
Debris contaminated with K022 waste	1706319H	K022
Spent sulfolane sludge with benzene	5202602H	D018
Heat exchanger cleaning solids from refinery exchanger cleaning	7001319H	D007, D008, K050
Heat exchanger cleaning liquids from refinery exchanger cleaning	7003114H	K050

TABLE 4-6
(continued)

Description	***TCEQ Waste Code (a)***	***EPA Waste Code***
Refinery hydrotreater catalyst, spent	7004393H	D001, D003, D004, D018, K171
Refinery crude oil storage sediment	7005319H	K169
Clarified slurry oil storage tank sediment	7006319H	K170
Catalyst, hazardous, spent*	8006393H	D001, D003, D004, D018
Spent acid solution	8007104H	D002
Spent caustic solutions	8008109H	D002, D018
Chrome contaminated media	8009319H	D007
Spent filter media contaminated with hazardous compounds*	8013310H	D001, U002, U003, U031, U041, U140, U159, U161
PCB contaminated media	8016319H	D001
Misc. listed organics from spills, drips, etc.	8017207H	D001, D018, D035, U002, U031, U140, U159, U161
Storage tank bottom solids from refinery/chemical plant storage	8018319H	D001, D018, D035, K169, K170, U031, U140
Wastewater from refinery/chemical production facilities	8019102H	D007, D018, D022, D026, D028, D035, D038
Wastewater received from co located facility	8022102H	K017, K019, K020
Filter media contaminated with benzene	8024404H	D001, D018
Amine/water mixture from fuel gas treating units, contains benzene	8025102H	D018
Pyrophoric solids	8032405H	D001

TABLE 4-6
(continued)

Description	*TCEQ Waste Code (a)*	*EPA Waste Code*
Tank seals	8038409H	D001, D018
Media contaminated with lead	8039319H	D008
No longer generated wastes (only listed below if it was disposed of in the MTR Landfill)		
Hazardous incinerator ash*	0311303H	D007, F002, F003, F005, K048
Paint wastes, liquid*	910650	F002, F003, F005
Sulfur-polymer*	948880	none
Biosolids, hazardous from refinery wastewater treater	0302607H	K048

NOTES:
(a) Also includes wastes generated by Shell Chemical Company located within the same complex.
(b) TCEQ = Texas Commission on Environmental Quality
* Wastes disposed of in the MTR landfill (presently or in the past).

TABLE 4-7
Volume of MTR Landfill Leachate
Shell Oil Company
Deer Park, Texas

Waste Name	1999 Tons	2000 Tons	2001 Tons
◆ **MTR Landfill Leachate**	3,836	9,237	9,306

MTR Landfill Leachate (a)

Monthly Avg. = 622 tons
Monthly Max. = 1,277 tons
Annual Avg. = 7,460 tons
Annual Max. = 9,306 tons

Shell wants to increase the maximum volume of 9,306 tons by approximately 50% to allow for potential future leachate volumes.

9306 tons/year x 1.5 = app. 14,000 tons/year

5.0 ANALYTICAL PLAN DEVELOPMENT

5.1 CONSTITUENTS FORMING BASIS OF LISTING

Table 5-1 shows the list of constituents for the F039 multisource leachate for which the waste was listed in 40 CFR 261, Appendix VII. The constituents are volatile organics, semivolatile organics, metals, pesticides, herbicides, dioxins and furans. Appendix VII of 261 refers to 40 CFR 268.43(a) for the list and states that the F039 listing includes "all constituents for which treatment standards are specified for multisource leachate".

5.2 SELECTION OF ANALYTE LIST

As part of the Sampling and Analysis Plan (SAP) for the petitioned waste stream, an analyte list was developed. The components of the list were based on process knowledge and previous analytical data. The list was reviewed and approved (with modifications) by EPA.

The analytes included on a total basis are the Appendix IX list of metals, volatiles, semivolatiles, pesticides, herbicides, PCBs and dioxins/furans. The Appendix IX constituents are a refined list taken from the Appendix VIII list of hazardous constituents. The Appendix IX list includes the constituents for which the Shell waste was listed, the constituents detected in the wastes, and any other compounds that may exist as byproducts of combustion (i.e., for the incinerator ash disposed of in the past).

Dioxins and furans may form as a byproduct from the incineration of chlorinated aromatic compounds such as chlorinated phenols, pesticides and PCBs (API, 1990, Dioxins and Furans – A Primer. Pub #4506). These compounds are included in the analytical program. A 2,3,7,8-TCDD equivalent was calculated for each set of dioxin/furan analyses using EPA methodology.

The Appendix IX pesticides, herbicides and PCBs were included in the analyte list as a conservative measure. These compounds are not used as raw products for contributing processes and are not generated as a result of process operations. In accordance with Section 6.6.2 of the "EPA RCRA Delisting Program Guidance Manual for the Petitioner" the waste streams samples were also analyzed for the following additional analyses:

- Total oil and grease;
- Total cyanide and sulfide;
- Ignitability and corrosivity

TABLE 5-1

Basis for Listing Hazardous Waste
40 CFR 261, Appendix VII
Shell Oil Company
Deer Park, Texas

F039

- Acenaphthene
- Acenaphthylene
- Acetone
- Acetonitrile
- Acetophenone
- 2-Acetylaminofluorene
- Acrolein
- Acrylonitrile
- Aldrin
- 4-Aminobiphenyl
- Aniline
- Anthracene
- Aramite
- alpha-BHC
- beta-BHC
- delta-BHC
- gamma-BHC
- Benzene
- Benz(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(a)pyrene
- Bromodichloromethane
- Methyl bromide (bromomethane)
- 4-Bromophenyl phenyl ether
- n-Butyl alcohol
- Butyl benzyl phthalate
- 2-sec-Butyl-4-6-dinitrophenol (dinoseb)

F039 (continued)

- Carbon disulfide
- Carbon tetrachloride
- Chlordane (alpha and gamma isomers)
- p-Chloroaniline
- Chlorobenzene
- Chlorobenzilate
- 2-Chloro-1,3-butadiene
- Chlorodibromomethane
- Chloroethane
- bis(2-Chloro-ethoxy)methane
- bis(2-chloroethyl)ether
- Chloroform
- bis(2-Chloroisopropyl)ether
- p-Chloro-m-cresol
- Chloromethane (methylene chloride)
- 2-Chloro-naphthalene
- 2-Chlorophenol
- 3-Chloropropylene
- Chrysene
- o-Cresol
- m-Cresol
- p-Cresol
- Cyclohexanone
- 1,2-Dibromo-3-chloropropane
- Ethylene dibromide
- Dibromomethane
- 2,4-D
- o,p'-DDD
- p,p'-DDD
- o,p'-DDE

TABLE 5-1

Basis for Listing Hazardous Waste
40 CFR 261, Appendix VII
Shell Oil Company
Deer Park, Texas

F039

- p,p'-DDE
- o,p'-DDT
- p,p'-DDT
- Dibenz(a,h)anthracene
- Dibenz(a,e)pyrene
- m-Dichlorobenzene
- o-Dichlorobenzene
- p-Dichlorobenzene
- Dichlorodifluoromethane
- 1,1-Dichloroethane
- 1,2-Dichloroethane
- 1,1-Dichloroethylene
- trans-1,2-Dichloroethylene
- 2,4-Dichlorophenol
- 2,6-Dichlorophenol
- 1,2-Dichloropropane
- cis-1,3-Dichloropropylene
- trans-1,3-Dichloropropylene
- Dieldrin
- Diethyl phthalate
- 2-4-Dimethyl phenol
- Dimethyl phthalate
- Di-n-butyl phthalate
- 1,4-Dinitrobenzene
- 4,6-Dinitro-o-cresol
- 2,4-Dinitrophenol
- 2-4-Dintrotoluene
- 2,6-Dinitrotoluene
- Di-n-octyl phthalate

F039 (continued)

- Di-n-propylnitrosamine
- 1,4-Dioxane
- Diphenylamine
- Diphenylnitrosamine
- 1,2-Diphenylhydrazine
- Disulfoton
- Endosulfan I
- Endosulfan II
- Endosulfan sulfate
- Endrin
- Endrin aldehyde
- Ethyl acetate
- Ehtyl cyanide (propanenitrile)
- Ethyl ether
- bis(2-Ethylhexyl)phthalate
- Ethyl methacrylate
- Ethylene oxide
- Famphur
- Fluoranthene
- Fluorene
- Heptachlor
- Heptachlor epoxide
- Hexachlorobenzene
- Hexachlorobutadiene
- Hexachlorocyclopentadiene
- HxCDDs (all dioxins)
- HxCDF (all furans)
- Hexachloroethane
- Hexachloropropylene

TABLE 5-1

Basis for Listing Hazardous Waste
40 CFR 261, Appendix VII
Shell Oil Company
Deer Park, Texas

F039	F039 (continued)
• Indeno (1,2,3-c,d)pyrene	• N-Nitrosopyrrolidine
• Iodomethane	• Parathion
• Isobutyl alcohol	• Total PCBs
• Isodrin	• Pentachlorobenzene
• Isosafrole	• PeCDDs
• Kepone	• PeCDFs
• Methacrylonitrile	• Pentachloronitrobenzene
• Methanol	• Pentachlorophenol
• Methapyrilene	• Phenacetin
• Methoxychlor	• Phenanthrene
• 3-Methylcholanthrene	• Phenol
• 4,4-Methylene bis(2-chloroaniline)	• Phorate
• Methyl ethyl ketone	• Phthalic anhydride
• Methyl isobutyl ketone	• Pronamide
• Methyl methacrylate	• Pyrene
• Methyl methansulfonate	• Pyridine
• Methyl parathion	• Safrole
• Naphthalene	• Silvex (2,4,5-TP)
• 2-Naphthylamine	• 2,4,5-T
• p-Nitroaniline	• 1,2,4,5-Tetrachlorobenzene
• Nitrobenzene	• TCDDs
• 5-Nitro-o-toluidine	• TCDFs
• p-Nitrophenol	• 1,1,1,2-Tetrachloroethane
• N-Nitrosodiethylamine	• 1,1,2,2-Tetrachloroethane
• N-Nitrosodimethylamine	• Tetrachloroethylene
• N-Nitroso-di-n-butylamine	• 2,3,4,6-Tetrachlorophenol
• N-Nitrosomethylethylamine	• Toluene
• N-Nitrosomorpholine	• Toxaphene
• N-Nitrosopiperidine	• Tribromomethane (bromoform)

TABLE 5-1

Basis for Listing Hazardous Waste
40 CFR 261, Appendix VII
Shell Oil Company
Deer Park, Texas

F039	F039 (continued)
• 1,2,4-Trichlorobenzene	• Antimony
• 1,1,1-Trichloroethane	• Arsenic
• 1,1,2-Trichloroethane	• Barium
• Trichloroethylene	• Beryllium
• Trichloromonofluoromethane	• Cadmium
• 2,4,5-Trichlorophenol	• Chromium (total)
• 2,4,6-Trichlorophenol	• Cyanides (total)
• 1,2,3-Trichloropropane	• Cyanides (amenable)
• 1,1,2-Trichloro-1,2,2-trifluoroethane	• Fluoride
• tris(2,3-Dibromopropyl)phosphate	• Lead
• Vinyl chloride	• Mercury
• Xylenes (sum of o,m,p isomers)	• Nickel
	• Selenium
	• Silver
	• Sulfide
	• Thallium
	• Vanadium

Notes: For F039 wastes, the basis of listing is "all constituents for which treatment standards are specified for multi-source leachate under 40CFR 268.43(a), Table CCW".

Because the waste stream is a liquid, no TCLP extraction/analyses were necessary. All analyses were performed on a total basis.

Table 5-2 shows the analytical program for characterizing the MTR Landfill Leachate in 2002. All analytical methods are from EPA SW-846 Test Methods for Evaluating Solid Waste-Physical and Chemical Methods.

TABLE 5-2

Target Compounds for Waste Characterization
Shell Oil Company
Deer Park, Texas

Constituents	EPA Method (a)
Appendix IX Analyses	
• Volatiles	8260B
• Semivolatiles (including PCBs, Pesticides, Herbicides	8270C
• Metals (b)	6010 for all but the following metals · 7470A mercury · 6020 arsenic · 6020 lead · 6020 selenium
• Herbicides (chlorinated)	8151A
• Pesticides (chlorinated and organophosphorus)	8081A/8141A
• PCBs	8082
• Dioxins/Furans	1613B
Hazardous Waste Characteristics/Other	
Ignitability	1010
pH	150.1
Reactive Sulfide (not required per EPA Pre-Petition Delisting Meeting)	Not required
Reactive Cyanide(not required per EPA Pre-Petition Delisting Meeting)	Not required
Total Cyanide	9012A
Total Sulfide	376.1
Total Oil and Grease	1664
Flouride	300
Methanol	8000

NOTES:

(a) Test Methods for Evaluating Solid Waste-Physical and Chemical Methods, EPA SW-846. Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.

(b) Appendix IX Metals were run on samples with pH adjustments to pH2, pH7 and pH9 on one of the four samples collected. (per EPA Pre-Petition Delisting Meeting).

6.0 WASTE SAMPLING INFORMATION

6.1 SAMPLING PERSONNEL INFORMATION

The landfill leachate was sampled by the following contractor:

Mr. Stephen Roach
On Site Hazardous Waste Coordinator
ONYX-Environmental Services
1800 S. Highway 146
Baytown, Texas 77520

6.2 SAMPLING STRATEGY

Sampling was conducted in accordance with a written sampling plan (dated April 10, 2002) and approved by the EPA in a letter dated May 31, 2002. Sample integrity was assured by following standard sample handling, preservation, documentation and custody procedures (see Sections 6.4 through 6.7). A total of eight samples and one duplicate were collected for characterization.

6.3 SAMPLE COLLECTION AND IDENTIFICATION

Four samples of the primary leachate and four samples of the secondary leachate were collected for characterization from June 2002 through October 2002. The sampling procedures in the Sampling and Analysis plan were modified to incorporate EPA's comments to sample and characterize the primary and secondary leachate separately (site visit May 2, 2002). Procedures were followed and documented to show that each leachate collection tank had a complete turnover between each sampling event. **Table C-1** in Appendix C documents the volume of leachate removed from each tank prior to each sampling event. This procedure ensured that four separate samples of leachate were collected from each tank rather than multiple samples from one tank volume of leachate.

6.3.1 Initial Sample

The valve to tank T-323 (primary leachate) was opened by the operator and about 1-liter of leachate was purged and added back to the tank. The sample was then collected directly into the sample bottles from the sample port. The sample for volatile analyses was collected first by slowly filling two 40-mL VOA vials with little to no turbulence. There was no headspace in the VOA vials when filled. The remaining bottles were then filled from the sample port. For metals analysis, the sample was collected into three bottles containing no preservative.

Instructions were added to the chain-of-custody form for the laboratory to adjust the pH to 2, 7 and 9 upon receipt. The date and time of collection was noted on each bottle and in the field notebook. The sample I.D. was **T323-1**. This procedure was repeated with tank T-324 (secondary leachate) except the sample I.D. was **T324-1**

6.3.2 Second Sample

Prior to collecting a second sample from the leachate tanks, at least one tank volume (per tank) was removed for disposal off site. The volume of leachate removed from each tank was documented. These log sheets are with the laboratory analytical reports in Appendix C to this petition. The samples were collected following the same procedures described above except that only one bottle for metals was filled for each sample. The bottle for metals contained preservative to adjust the sample pH to less than 2.0. The sample I.D.s were **T323-2** and **T324-2**. The dates and times of sample collection were noted on the labels, field notebook and volume log form.

6.3.3 Third Sample and Duplicate

The third sampling event was conducted following the above procedures. The sample I.D.s were **T323-3** and **T323-4**. The date and time of collection was noted on the sample labels, logbook and volume log form.

6.3.4 Fourth Sample

The fourth sampling event was conducted following the procedures in Section 6.3.2. A duplicate sample was collected from tank T-324 for QA/QC analysis. The fourth sample I.D.s were **T323-4, T324-4A** and **T324-4B**. The dates and times of sample collection were noted on the labels, field notebook and volume log form.

Resample Event

Due to anomalous readings for nickel in the fourth primary sample and methanol in the fourth secondary sample, a resample event was conducted on December 23, 2002. These samples I.D.s were **Primary** and **Secondary.** The dates and times of sample collection were noted on the labels, field notebook and volume log form.

6.4 SAMPLE PRESERVATION AND HANDLING

All samples were placed in clean containers provided by the laboratory. Sample preservatives were provided in the sample containers by the analytical laboratory. **Table 6-1** shows the containers, preservation, and EPA holding times for the samples. Once the

TABLE 6-1

Sample Containers, Preservation and Holding Times
Shell Oil Company
Deer Park, Texas

Analysis	Sample Size/Container (Plastic/Glass)	Preservation	Holding Time
Appendix IX Volatiles	2 x 40 ml glass vials	Cool to 4°C HCl to pH < 2	14 days
Appendix IX Semivolatiles	2 x 1,000 ml glass	Cool to 4°C $Na_2S_2O_3$	7/40 (a)
Appendix IX Pesticides/Herbicides PCBs	4 x 1,000 ml glass	Cool to 4°C	7/40 (a)
Ignitability	1 x 500 ml plastic/glass	Cool to 4°C	28 days
pH	50 ml/plastic or glass	Cool to 4°C	Analyze immediately
Oil and Grease	1 x 1,000 ml glass	H_2S0_4 to pH<2	28 days
Total Sulfide	1 x 500 ml glass/plastic	Cool to 4°C Zinc acetate, NaOH to pH>9	7 days
Total Cyanide	1 x 1000 ml glass/plastic	Cool to 4°C Ascorbic acid, NaOH to pH>12	14 days
Appendix IX Metals	500 ml/plastic or glass	HNO_3 to pH < 2	6 months except mercury (28 days)
for pH7 and pH9 ***(initial sample only)***	(2) 500 ml/plastic or glass	No preservative (b)	same as above
Appendix IX Dioxins/Furans	2 x 1,000 ml/glass	Cool to 4°C	40 days/40 days

NOTES:

(a) 7/40 = Extract within 7 days of collection, analyze within 40 days of extraction.

(b) Request on chain-of-custody form that sample pH be adjusted in the lab to pH 7 and pH 9.

samples were collected, they were secured in an ice chest with a completed chain-of-custody form. The cooler were sealed with tape and was picked up by the laboratory.

6.5 SAMPLING DOCUMENTATION

To prevent misidentification of samples, labels were attached to each sample container. The labels were water proof and legible contained the following information:

- Sample identification number
- Date and time of collection
- Sample description
- Name of sampler
- Analysis to be performed

A bound field notebook was maintained to provide daily records of significant events, observations, and measurements. All entries were made using a pen or indelible marker. The field notebook documented the following:

- Date and time of sampling event
- Name of sample collector
- Process sampled
- Description of waste
- Sample location
- Sampling method
- Number, volume, and appearance of sample
- Sample preservation
- Any field measurements made
- Field observations

6.6 SAMPLE CUSTODY

Chain-of-custody procedures were used to trace possession and handling of individual samples from the time of collection in the field through receipt by the independent analytical laboratory.

Each time a batch of samples was prepared for pickup by the laboratory, a chain-of-custody record was completed and accompanied the shipment. Whenever custody of the samples was transferred, the individual relinquishing and the individual receiving the samples signed, dated, and noted the time on the form. The original form accompanied the shipment to the laboratory and was returned to the Project Manager with the analytical laboratory reports.

If a delivery or courier service was used to transport the samples, the bill of lading or receipt from the independent service was maintained by the Project Manager to document custody for that segment of the sample transport.

6.7 QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Each of the samples analyzed was subjected to extensive quality control. Quality control procedures in the field included sample handling and documentation protocols as described previously. Techniques were used in the field to avoid sample contamination and to adequately preserve each sample until it reached the laboratory. There was no sampling equipment associated with tank sampling, as samples were collected directly into the sample containers. Decontamination of equipment was not necessary (equipment rinsate samples were not necessary).

Sampling personnel wore disposal nitrile gloves to reduce the possibility of cross contamination. Sample bottles were laboratory-precleaned containers that met cleaning QC requirements.

Trip blanks, consisting of laboratory grade deionized water were supplied by the laboratory. These blanks were carried with the sample containers during the first week and last week of sample collection. The Trip Blanks were analyzed for Appendix IX VOA analyses. The purpose of the trip blanks was to determine the impact, if any, of ambient VOC concentrations in the refinery and laboratory during sampling and analysis.

Additional quality control procedures were employed in the laboratory. As a minimum, laboratory QA/QC procedures were in accordance with the guidelines in Volume One, Chapter One of EPA document SW-846. Laboratory QA/QC samples included method blank analyses, surrogate spikes and calibration curves. A discussion of the laboratory and field QA/QC data is presented in the Quality Assurance Report in **Appendix A** to this Delisting Petition.

6.8 STATEMENT OF REPRESENTATIVENESS OF SAMPLES

Based on the sampling strategy discussed in Section 6.2 (and in the SAP) and the use of EPA approved methods to collect, analyze and maintain proper documentation and custody of the samples, the samples of primary and secondary landfill leachate collected in 2002 are considered representative of the petitioned waste stream. There were no deviations from the SAP dated April 10, 2002 and revised May 15, 2002 during the June 2002-December 2002 sampling events (except the duplicate was collected from Round 4 instead of Round 3).

7.0 WASTE ANALYSIS INFORMATION

7.1 ANALYTICAL LABORATORY INFORMATION

The following laboratories were used for analysis of samples collected in support for this delisting petition:

Severn Trent Laboratories, Inc. (STL)
6310 Rothway Street
Houston, Texas 77045
Phone: (713) 690-4444

Alta Analytical Laboratory
5070 Robert J. Mathew Parkway
El Dorado Hills, California 95762
Phone: (916) 933-1640
* For analysis of Dioxin/Furans

Severn Trent Laboratories, Inc. (STL)
14046 Summit Drive
Austin, Texas 78728
(512) 244-0855
*For analysis of organophosphorous pesticides

STL Houston performed all analyses except those indicated with an asterisk (*). The professional qualifications for the individuals who performed the analyses of the waste samples are included in **Appendix D.**

The Quality Assurance Report in **Appendix A** contains information relating to the laboratory handling and analysis procedures employed for the waste samples. Included in **Appendix A** are the Sample I.D., laboratory I.D., sample preservation technique, sample collection dates and dates of sample extraction and analysis. The specific equipment used is coded to an equipment list in the Quality Assurance Report. A list of the analytical methods used for each of the analyses is also included in the Quality Assurance Report.

7.2 SUMMARY OF ANALYTICAL RESULTS

This section summarizes the results of analyses performed on samples collected from the petitioned waste stream from June 2002 through December 2002. A copy of the laboratory analytical reports are included as **Appendix C.**

7.2.1 Hazardous Waste Characteristics

A summary of the results of analyses for reactivity, ignitability and corrosivity is included in **Table 7-1**. As shown, none of the samples exhibit hazardous waste characteristics as defined by 40 CFR 261.22 and 261.23. **Table 7-2** and **Table 7-3** compare the concentrations of the TCLP constituents in the primary and secondary leachate, respectively, to the maximum TCLP levels found in 40 CFR 261.24. As shown, none of the constituents in the primary or secondary leachate exceed the maximum allowable TCLP concentrations and the landfill leachate is not hazardous due to the toxicity characteristic.

7.2.2 Appendix IX Analytes Detected on a Total Basis

Summaries of the constituents detected in the MTR Landfill Leachate, are presented in **Table 7-4** and **Table 7-5** for the primary and secondary leachate, respectively. Only those constituents detected above the limit of quantitation (LOQ) are shown for the volatile and semivolatile organics.

Volatile Organics

The volatile organic analyses were run on grab samples collected from the Primary Leachate Tank (T323) and from the Secondary Leachate Tank (T324). As shown very few volatiles were detected.

Semivolatile Organics, PCBs, Pesticide, Herbicides, and Dioxin/Furans

Tables 7-4 and **7-5** present a summary of the semivolatile constituents, pesticides, herbicides, PCBs and dioxin/furan results for the primary and secondary leachate samples. For the dioxin/furan results, EPA Region 6 recommends calculating a toxicity equivalent quotient (TEQ) for 2,3,7,8-tetrachlorodibenzo(p)dioxin (TCDD). The toxicity equivalent quotient is calculated by converting the 17 dioxin/furan congener concentrations to a 2,3,7,8-TCDD concentration using toxicity equivent factors (TEFs). The TEFs for the 17 congeners are listed in EPA Region 6 Delisting Technical Support Document (8/31/02). The 2,3,7,8-TCDD equivalent calculation spreadsheets are in Appendix E for the sampling events. The calculated 2,3,7,8-TCDD values are shown in **Tables 7-4** and **7-5**. These values are compared to EPA's delisting value for this constituent.

Metals

A summary of the Appendix IX metals detected in the samples over the sampling period is shown in **Table 7-6** and **Table 7-7** for the primary and secondary leachate, respectively.

During the first week of sampling, three samples were collected for pH adjustment to pH2, pH 7 and pH9 prior to analysis for metals. This procedure was required by EPA to simulate leachate from a landfill. In accordance with the approved SAP this procedure was conducted on only one set of samples. A review of the data in **Tables 7-6** and **7-7** show that the pH variance did not appear to affect the concentration of the metals in the samples.

TABLE 7-1

Summary of Reactivity, Corrosivity, and Ignitability Analyses
MTR Landfill Leachate
Shell Oil Company
Deer Park, Texas

Sample ID	Date Collected	Concentration Total Sulfide (mg/L)	Total Cyanide (µg/L)	pH (Std. Units)	Ignitability (Flashpoint) (Degrees F)
T323-1 Primary Leachate No. 1	6/11/2002	23	<10.0	7.80	>212
T324-1 Secondary Leachate No. 1	6/11/2002	<5.0	<10.0	7.64	>212
T323-2 Primary Leachate No. 2	8/1/02	50	<10.0	7.91	>212
T324-2 Secondary Leachate No. 2	9/4/02	19	<50	8.41	>212
T323-3 Primary Leachate No. 3	9/6/02	22	<10.0	NA	>212
T324-3 Secondary Leachate No. 3	10/14/02	6.8	<10.0	7.4	>212
T323-4 Primary Leachate No. 4	9/27/02	110	<10.0	7.5	>212
T324-4A Secondary Leachate No. 4	10/24/02	16	<10.0	7.53	>212
T324-4B (Dup) Secondary Leachate No. 4	10/24/02	15	<10.0	7.37	>212
Hazardous Waste Criteria (40 CFR 261.21-261.23)		>500 mg/kg	>250 mg/kg	≤2 or ≥12.5	<140°F

Notes:
<## = Not detected above the indicated laboratory Limit of Quantitation.

(a) Oil and Grease concentrations ranged from <5.0 mg/L to 8.2 mg/L in T323 samples and from 5.0 mg/L to 230 mg/L in T324 samples.

(b) Fluoride concentrations were <0.30 mg/L in T323 samples and ranged from <0.30 mg/L to 0.54 mg/L in T324 samples.

TABLE 7-2

Summary of Toxicity Characteristic Analyses
MTR Landfill Leachate – Primary (T-323)
Shell Oil Company
Deer Park, Texas

Contaminant	Regulatory Level (mg/L) (a)	T323-1 6/11/2002 (mg/L)	T323-2 8/1/2002 (mg/L)	T323-3 9/6/2002 (mg/L)	T323-4 9/27/2002 (mg/L)
Arsenic	5.0	<0.010	***0.0294***	0.0148	<0.05
Barium	100.0	0.119	***0.237***	0.108	0.072
Benzene	0.5	<0.005	***0.018***	<0.05	0.008
Cadmium	1.0	<0.005	***<0.010***	<0.005	<0.005
Carbon tetrachloride	0.5	<0.005	<0.005	***<0.05***	<0.005
Chlordane	0.03	<0.00005	<0.00005	***<0.0001***	<0.00005
Chlorobenzene	100.0	<0.005	<0.005	***<0.05***	<0.005
Chloroform	6.0	<0.005	<0.005	***<0.05***	<0.005
Chromium	5.0	<0.010	***0.014***	<0.010	<0.010
o-Cresol	200.0	***<0.010***	<0.0015	<0.0015	<0.0015
m-Cresol	200.0	***<0.010***	<0.0015	<0.0015	<0.0015
p-Cresol	200.0	0.020	***0.028***	0.00184	0.0127
Cresol	200.0	0.020	***0.028***	0.00184	0.0127
2,4-D	10.0	***<0.005***	<0.001	<0.001	<0.001
1,4-Dichlorobenzene	7.5	***<0.010***	<0.002	<0.002	<0.002
1,2-Dichloroethane	0.5	<0.005	<0.005	***<0.05***	<0.005
1,1-Dichloroethylene	0.7	<0.005	<0.005	***<0.05***	<0.005
2,4-Dinitrotoluene	0.13	***<0.010***	<0.0015	<0.0015	<0.015
Endrin	0.02	<0.0001	<0.0001	***<0.0002***	<0.001
Heptachlor (and its Epoxide)	0.008	<0.00005	<0.00005	***<0.0001***	<0.00005
Hexachlorobenzene	0.13	***<0.010***	<0.0015	<0.0015	<0.0015
Hexachlorobutadiene	0.5	***<0.010***	<0.002	<0.002	<0.002
Hexachloroethane	3.0	***<0.010***	<0.002	<0.002	<0.002
Lead	5.0	<0.003	<0.010	<0.003	***<0.015***
Lindane	0.4	<0.00005	<0.00005	***<0.0001***	<0.00005
Mercury	0.2	***<0.0002***	<0.0002	<0.0002	<0.0002
Methoxychlor	10.0	<0.0005	<0.0005	***<0.001***	<0.0005
Methyl ethyl ketone	200.0	<0.010	<0.010	***<0.100***	<0.010
Nitrobenzene	2.0	***<0.010***	<0.0015	<0.0015	<0.0015
Pentachlorophenol	100.0	***<0.050***	<0.0015	<0.0015	<0.0015
Pyridine	5.0	***<0.010***	<0.004	<0.004	<0.004
Selenium	1.0	0.008	***0.0151***	0.0086	<0.025
Silver	5.0	***<0.010***	<0.010	<0.010	<0.010
Tetrachloroethylene	0.7	<0.005	<0.005	***<0.05***	<0.005
Toxaphene	0.5	<0.005	<0.005	***<0.010***	<0.005
Trichloroethylene	0.5	<0.005	<0.005	***<0.05***	<0.005
2,4,5-Trichlorophenol	400.0	***<0.010***	<0.002	<0.002	<0.002
2,4,6-Trichloroprophenol	2.0	***<0.010***	<0.002	<0.002	<0.002
2,4,5-TP (Silvex)	1.0	***<0.005***	<0.001	<0.001	<0.001
Vinyl Chloride	0.2	<0.010	<0.010	<0.100	***<0.010***

Notes:
(a) Maximum concentration of constituents for the Toxicity Characteristic 40 CFR 261.24 Table 1.
(b) The maximum concentration is shown in ***bold and italics***.

TABLE 7-3

Summary of Toxicity Characteristic Analyses
MTR Landfill Leachate – Secondary (T-324)
Shell Oil Company
Deer Park, Texas

Contaminant	Regulatory Level (mg/L) (a)	T324-1 6/11/2002 (mg/L)	T324-2 9/4/2002 (mg/L)	T324-3 10/14/2002 (mg/L)	T324-4A 10/24/2002 (mg/L)	T324-4B (Dup) 10/24/2002 (mg/L)
Arsenic	5.0	***<0.010***	<0.010	<0.010	<0.010	<0.010
Barium	100.0	0.10	0.114	0.199	0.313	***0.326***
Benzene	0.5	<0.005	0.006	***0.014***	<0.005	<0.005
Cadmium	1.0	<0.005	<0.005	***<0.005***	<0.005	<0.005
Carbon tetrachloride	0.5	<0.005	<0.005	***<0.005***	<0.005	<0.005
Chlordane	0.03	<0.00005	<0.0005	***<0.0005***	<0.00005	<0.00005
Chlorobenzene	100.0	<0.005	<0.005	***<0.005***	<0.005	<0.005
Chloroform	6.0	<0.005	***<0.005***	<0.005	<0.005	<0.005
Chromium	5.0	<0.010	***<0.010***	<0.010	<0.010	<0.010
o-Cresol	200.0	<0.010	***<0.0075***	<0.0015	<0.0015	<0.0015
m-Cresol	200.0	<0.010	***<0.0075***	<0.0015	<0.0015	<0.0015
p-Cresol	200.0	<0.010	<0.0075	<0.0015	<0.0015	***0.00414***
Cresol	200.0	<0.010	<0.0075	<0.0015	<0.0015	***0.00414***
2,4-D	10.0	<0.001	<0.001	<0.001	<0.001	***<0.001***
1,4-Dichlorobenzene	7.5	<0.010	<0.010	<0.002	<0.002	***<0.002***
1,2-Dichloroethane	0.5	<0.005	<0.005	0.014	0.017	***0.018***
1,1-Dichloroethylene	0.7	<0.005	***<0.005***	<0.005	<0.005	<0.005
2,4-Dinitrotoluene	0.13	<0.010	***<0.0075***	<0.0015	<0.0015	<0.0015
Endrin	0.02	<0.00001	<0.0001	<0.0001	<0.0001	***<0.0001***
Heptachlor (and its Epoxide)	0.008	<0.00005	<0.00005	<0.00005	<0.00005	***<0.00005***
Hexachlorobenzene	0.13	<0.010	***<0.0075***	<0.0015	<0.0015	<0.0015
Hexachlorobutadiene	0.5	<0.010	***<0.010***	<0.002	<0.002	<0.002
Hexachloroethane	3.0	<0.010	***<0.010***	<0.002	<0.002	<0.002
Lead	5.0	<0.003	<0.003	***0.0083***	<0.003	<0.003
Lindane	0.4	***<0.00005***	<0.00005	<0.00005	<0.00005	<0.00005
Mercury	0.2	***<0.0002***	<0.0002	<0.0002	<0.0002	<0.0002
Methoxychlor	10.0	***<0.0005***	<0.0005	<0.0005	<0.0005	<0.0005
Methyl ethyl ketone	200.0	***<0.010***	<0.010	<0.010	<0.010	<0.010
Nitrobenzene	2.0	***<0.010***	<0.0075	<0.0015	<0.0015	<0.0015
Pentachlorophenol	100.0	***<0.050***	<0.0075	<0.0015	<0.0015	<0.0015
Pyridine	5.0	<0.010	***<0.020***	<0.004	<0.004	<0.004
Selenium	1.0	***0.0078***	<0.005	0.0053	<0.005	<0.005
Silver	5.0	***<0.010***	<0.010	<0.010	<0.010	<0.010
Tetrachloroethylene	0.7	***<0.005***	<0.005	<0.005	<0.005	<0.005
Toxaphene	0.5	***<0.005***	<0.005	<0.005	<0.005	<0.005
Trichloroethylene	0.5	***<0.005***	<0.005	<0.005	<0.005	<0.005
2,4,5-Trichlorophenol	400.0	***<0.010***	<0.010	<0.002	<0.002	<0.002
2,4,6-Trichloroprophenol	2.0	***<0.010***	<0.010	<0.002	<0.002	<0.002
2,4,5-TP (Silvex)	1.0	***<0.001***	<0.001	<0.001	<0.001	<0.001
Vinyl Chloride	0.2	***<0.010***	<0.010	<0.010	<0.010	<0.010

Notes:
(a) Maximum concentration of constituents for the Toxicity Characteristic 40 CFR 261.24 Table 1.
(b) The maximum concentration is shown in ***bold and italics.***

TABLE 7-4

Summary of Appendix IX Organic Constituents Detected
MTR Landfill Leachate – Primary (T-323)
Shell Oil Company
Deer Park, Texas

Sample ID:	T323-1	T323-2	T323-3	T323-4
Units:	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Sample Collected:	(6/11/2002)	(8/1/2002)	(9/6/2002)	(9/27/2002)
Appendix IX Volatiles				
Acetone	0.030	***0.030***	<0.100	0.020
Benzene	<0.005	***0.018***	<0.050	0.008
Toluene	<0.005	***0.600***	<0.050	<0.005
Methanol	<2.5	<2.5	<2.5	<2.5
Appendix IX Semivolatiles				
4-Methylphenol (p-cresol)	0.020	***0.028***	0.00184	0.013
Naphthalene	<0.010	***0.0317***	<0.002	<0.002
2,4-Dimethyl phenol	<0.010	***0.0041***	<0.0015	0.0019
Phenol	<0.010	***0.0352***	0.0081	0.015
Acetophenone	<0.010	<0.0015	***0.00303***	0.0016
Phenanthrene	<0.010	<0.0015	<0.0015	***0.0052***
Fluorene	<0.010	<0.0015	<0.0015	***0.00165***
Bis (2-ethylhexyl)phthalate	<0.010	<0.0015	<0.0015	***0.0037***
Appendix IX Organochlorine Pesticides (all non detects)				
Aldrin	<0.00005	<0.00005	***<0.0001***	<0.00005
alpha-BHC	<0.00005	<0.00005	***<0.0001***	<0.00005
beta-BHC	<0.00005	<0.00005	***<0.0001***	<0.00005
gamma-BHC (Lindane)	<0.00005	<0.00005	***<0.0001***	<0.00005
delta-BHC	<0.00005	<0.00005	***<0.0001***	<0.00005
Chlordane	<0.00005	<0.00005	***<0.0001***	<0.00005
alpha-Chlordane	<0.00005	<0.00005	***<0.0001***	<0.00005
gamma-Chlordane	<0.00005	<0.00005	***<0.0001***	<0.00005
4,4'-DDD	<0.0001	***<0.0001***	N/A	<0.0001
4,4'-DDE	<0.0001	***<0.0001***	N/A	<0.0001
4,4'-DDT	<0.0001	***<0.0001***	N/A	<0.0001
Dieldrin	<0.0001	<0.0001	***<0.0002***	<0.0001
Endosulfan I	<0.00005	<0.00005	***<0.0001***	<0.00005
Endosulfan II	<0.0001	<0.0001	***<0.0002***	<0.0001
Endosulfan sulfate	<0.0001	<0.0001	***<0.0002***	<0.0001

Table 7-4
(continued)

Sample ID:	T323-1	T323-2	T323-3	T323-4
Units:	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Sample Collected:	(6/11/2002)	(8/1/2002)	(9/6/2002)	(9/27/2002)
Endrin	<0.0001	<0.0001	***<0.0002***	<0.0001
Endrin aldehyde	<0.0001	<0.0001	***<0.0002***	<0.0001
Heptachlor	<0.00005	<0.00005	***<0.0001***	<0.00005
Heptachlor epoxide	<0.00005	<0.00005	***<0.0001***	<0.00005
Methoxychlor	<0.0005	<0.0005	***<0.001***	<0.0005
Toxaphene	<0.005	<0.005	***<0.010***	<0.005
Kepone	<0.0025	<0.0025	***<0.005***	<0.0025
Appendix IX Organophosphorus Pesticides (all non detects)				
Disulfoton	N/A	<0.0002	<0.0019	***<0.0002***
Phorate	N/A	<0.0002	<0.0019	***<0.0002***
Dimethoate	N/A	<0.0002	<0.0019	***<0.0002***
Methyl parathion	N/A	<0.0002	<0.0019	***<0.0002***
Ethyl parathion	N/A	<0.0002	<0.0019	***<0.0002***
Famphor	N/A	<0.0002	<0.0019	***<0.0002***
Sulfotepp	N/A	<0.0002	<0.0019	***<0.0002***
O,O,O-Triethylphosphorothioate	N/A	<0.0002	<0.0019	***<0.0002***
Appendix IV Herbicides (all non detects)				
2,4-D	<0.005	<0.001	<0.001	***<0.001***
2,4,5-TP	<0.005	<0.001	<0.001	***<0.001***
2,4,5-T	<0.005	<0.001	<0.001	***<0.001***
Appendix IX PCBs (all non detects)				
Arochlor 1016	<0.001	<0.00095	<0.001	***<0.001***
Arochlor 1221	<0.001	<0.00095	<0.001	***<0.001***
Arochlor 1232	<0.001	<0.00095	<0.001	***<0.001***
Arochlor 1242	<0.001	<0.00095	<0.001	***<0.001***
Archolor 1248	<0.001	<0.00095	<0.001	***<0.001***
Arochlor 1254	<0.001	<0.00095	<0.001	***<0.001***
Arochlor 1260	<0.001	<0.00095	<0.001	***<0.001***
Appendix IX Dioxins/Furans				
2,3,7,8-TCDD Equivalent	2.45E-09	2.13E-09	***4.47E-09***	3.24E-09

Notes:
<## = Not detected above the indicated LOQ.

Maximum concentrations shown in ***bold and italic font***

TABLE 7-5

Summary of Appendix IX Organic Constituents Detected
MTR Landfill Leachate – Secondary (T-324)
Shell Oil Company
Deer Park, Texas

Sample ID:	T324-1	T324-2	T324-3	T324-4A	T324-4B (Dup)
Units:	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Sample Collected:	(6/11/2002)	(9/4/2002)	(10/14/2002)	(10/24/2002)	(10/24/2002)
Appendix IX Volatiles					
Acetone	0.020 **B**	0.020	<0.010	0.070	***0.090***
Benzene	<0.005	0.006	***0.014***	<0.005	<0.005
Ethylbenzene	<0.005	***0.005***	<0.005	<0.005	<0.005
1,2-Dichloroethane	<0.005	<0.005	0.014	0.017	***0.018***
Xylenes	<0.015	***0.033***	<0.015	<0.015	<0.015
Methanol	<2.5	<2.5	<2.5	<2.5 (a)	***4.8***
Appendix IX Semivolatiles					
4-methylphenol (p-cresol)	<0.010	<0.0075	<0.0015	<0.0015	***0.00414***
Naphthalene	<0.010	***0.0241***	0.0125	<0.002	0.01173
2,4-Dimethylphenol	<0.010	***0.0222***	<0.0015	0.00166	<0.0015
Phenol	<0.010	<0.0075	0.0106	<0.0015	***0.01177***
Acetophenone	<0.010	<0.0075	<0.0015	***0.00181***	<0.0015
Phenanthrene	<0.010	***0.0574***	0.0051	<0.0015	0.00242
Fluorene	<0.010	***0.0288***	0.00246	<0.0015	0.00189
Bis(2-ethyhexyl)phthalate	<0.010	***0.027***	<0.0025	<0.0025	<0.0025
Acenaphthene	<0.010	***0.024***	0.00277	<0.0015	0.00244
Appendix IX Organochlorine Pesticides					
Aldrin	<0.00005	<0.00005	<0.00005	***<0.00005***	<0.00005
alpha-BHC	<0.00005	<0.00005	***0.000576***	0.000143	0.000219
beta-BHC	<0.00005	<0.00005	***<0.00005***	<0.00005	<0.00005
gamma-BHC (Lindane)	<0.00005	<0.00005	***<0.00005***	<0.00005	<0.00005
delta-BHC	<0.00005	<0.00005	***0.000603***	0.000076	0.000106
Chlordane	<0.00005	<0.00005	***<0.00005***	<0.00005	<0.00005
alpha-Chlordane	<0.00005	<0.00005	***<0.00005***	<0.00005	<0.00005
gamma-Chlordane	<0.00005	<0.00005	***<0.00005***	<0.00005	<0.00005
4,4'-DDD	<0.0001	***0.0016***	0.00024	<0.0001	0.00013
4,4'-DDE	<0.0001	<0.0001	***<0.0001***	<0.0001	<0.0001
4,4'-DDT	<0.0001	<0.0001	***<0.0001***	<0.0001	<0.0001
Dieldrin	<0.0001	<0.0001	***<0.0001***	<0.0001	<0.0001
Endosulfan I	<0.00005	<0.00005	***<0.00005***	<0.00005	<0.00005
Endosulfan II	<0.0001	<0.0001	***<0.0001***	<0.0001	<0.0001

Table 7-5
(Continued)

Sample ID: Units: Sample Collected:	T324-1 (mg/L) (6/11/2002)	T324-2 (mg/L) (9/4/2002)	T324-3 (mg/L) (10/14/2002)	T324-4A (mg/L) (10/24/2002)	T324-4B (Dup) (mg/L) (10/24/2002)
Endosulfan sulfate	<0.0001	<0.0001	<0.0001	<0.0001	***<0.0001***
Endrin	<0.0001	<0.0001	<0.0001	<0.0001	***<0.0001***
Endrin aldehyde	<0.0001	<0.0001	<0.0001	<0.0001	***<0.0001***
Heptachlor	<0.00005	<0.00005	<0.00005	<0.00005	***<0.00005***
Heptachlor epoxide	<0.00005	<0.00005	<0.00005	<0.00005	***<0.00005***
Methoxychlor	<0.0005	<0.0005	<0.0005	<0.0005	***<0.0005***
Toxaphene	<0.005	<0.005	<0.005	<0.005	***<0.005***
Kepone	<0.0025	<0.0025	<0.0025	<0.0025	***<0.0025***
Appendix IX Organophosphorus Pesticides					
Dimethoate	N/A	<0.0019	<0.0019	***0.004***	<0.002
Disulfoton	N/A	<0.0019	<0.0019	***<0.002***	<0.002
Famphur	N/A	<0.0019	<0.0019	***<0.002***	<0.002
Methyl parathion	N/A	<0.0019	<0.0019	***<0.002***	<0.002
Ethyl parathion	N/A	<0.0019	<0.0019	***<0.002***	<0.002
Phorate	N/A	<0.0019	<0.0019	***<0.002***	<0.002
Sulfotepp	N/A	<0.0019	<0.0019	***<0.002***	<0.002
O,O,O-Triethylphosphorothioate	N/A	<0.0019	<0.0019	***<0.002***	<0.002
Appendix IX Herbicides (all non dectects)					
2,4-D	<0.001	<0.001	<0.001	***<0.001***	<0.001
2,4,5-TP	<0.001	<0.001	<0.001	***<0.001***	<0.001
2,4,5-T	<0.001	<0.001	<0.001	***<0.001***	<0.001
Appendix IX PCBs (all non detects)					
Arochlor 1016	<0.001	<0.001	***<0.001***	<0.001	<0.001
Arochlor 1221	<0.001	<0.001	***<0.001***	<0.001	<0.001
Arochlor 1232	<0.001	<0.001	***<0.001***	<0.001	<0.001
Arochlor 1242	<0.001	<0.001	***<0.001***	<0.001	<0.001
Arochlor 1248	<0.001	<0.001	***<0.001***	<0.001	<0.001
Arochlor 1254	<0.001	<0.001	***<0.001***	<0.001	<0.001
Arochlor 1260	<0.001	<0.001	***<0.001***	<0.001	<0.001
Appendix IX Dioxins/Furans					
2,3,7,8-TCDD Equivalent	3.79E-09	***9.40E-09***	7.05E-09	3.67E-09	3.66E-09

Notes:
<## = Not detected above the indicated LOQ.
Maximum concentrations shown in ***bold and italic font***
(a) The original value was 7.6 mg/L. The MS/MSD samples showed high percent recoveries indicating this value may be biased high. The data shown is for a resample collected December 23, 2002 per EPA's consent.
(b) B = detected in blank. Sample concentration less than five times the blank concentration.

TABLE 7-6

Summary of Appendix IX Metals Results
MTR Landfill Leachate – Primary (T-323)
Shell Oil Company
Deer Park, Texas

	Primary Leachate Tank (T-323)					
Sample ID:	T323-1 pH 2	T323-1 pH 7	T323-1 pH 9	T323-2	T323-3	T323-4
Units:	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Sample Collected:	6/11/02	6/11/02	6/11/02	8/1/02	9/6/02	9/27/02
Appendix IX Metals						
Antimony	***<0.05***	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.010	<0.010	<0.010	***0.0295***	0.0148	<0.05
Barium	0.119	0.120	0.025	***0.237***	0.108	0.072
Beryllium	<0.005	<0.005	<0.005	***<0.010***	<0.005	<0.005
Cadmium	<0.005	<0.005	<0.005	***<0.010***	<0.005	<0.005
Chromium	<0.010	<0.010	<0.010	***0.014***	<0.010	<0.010
Cobalt	<0.010	<0.010	<0.010	NA	<0.010	***0.016***
Copper	<0.010	<0.010	<0.010	NA	***0.025 B***	0.022 **B**
Lead	<0.003	<0.003	<0.003	<0.010	<0.003	***<0.015***
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	***<0.0002***
Nickel	0.116	0.112	0.130	0.285	0.00693	***0.906 (a)***
Selenium	0.008	0.0082	0.0076	***0.015***	0.0086	<0.025
Silver	<0.01	<0.01	<0.01	NA	<0.01	***<0.01***
Tin	<0.02	<0.02	<0.02	NA	<0.02	***<0.02***
Thallium	<0.030	<0.030	<0.030	<0.003	<0.003	***<0.03***
Vanadium	0.036	0.034	0.041	***0.113***	0.063	0.046

Notes:
<## = Not detected above the indicated LOQ.
Maximum concentrations shown in ***bold and italic font.***

(a) The original value was 2.86 mg/L. Nickel was also detected in the method blank. Due to the anomalous high nickel value, a resample was collected on December 23, 2002 per EPA's consent. The data shown is for the resample.
(b) B = detected in blank. Sample concentration less than five times the blank concentration.

TABLE 7-7

Summary of Appendix IX Metals Results
MTR Landfill Leachate – Secondary (T-324)
Shell Oil Company
Deer Park, Texas

	Secondary Leachate Tank (T-324)						
Sample ID:	T324-1 pH 2	T324-1 pH 7	T324-1 pH 9	T324-2	T324-3	T324-4A	T324-4B Dup
Units:	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Sample Collected:	6/11/2002	6/11/2002	6/11/2002	9/3/2002	(10/14/02)	(10/24/02)	(10/24/02)
Appendix IX Metals							
Antimony	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	***<0.05***
Arsenic	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	***<0.010***
Barium	0.010	0.097	0.040	0.114	0.199	0.313	***0.326***
Beryllium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	***<0.005***
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	***<0.005***
Chromium	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	***<0.01***
Cobalt	0.032	***0.052***	<0.037	<0.010	0.043	<0.01	<0.01
Copper	<0.010	<0.010	<0.010	<0.010	***0.082***	0.014	0.011
Lead	<0.003	<0.003	<0.003	<0.003	***0.0083***	<0.003	<0.003
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	***<0.0002***	<0.0002	<0.0002
Nickel	0.113	0.118	0.117	0.055	***0.414***	0.095	0.080
Selenium	0.0078	***0.0083***	0.0081	<0.005	0.0053	<0.005	<0.005
Silver	<0.010	<0.010	<0.010	<0.010	***<0.010***	<0.010	<0.010
Thallium	<0.030	<0.030	<0.030	<0.030	***<0.030***	<0.030	<0.030
Tin	<0.020	<0.020	<0.020	<0.020	***<0.020***	<0.020	<0.020
Vanadium	0.031	0.032	0.033	0.038	***0.130***	0.040	0.030

Notes:

<## = Not detected above the indicated LOQ.

Maximum concentrations shown in ***bold and italic font.***

8.0 DATA EVALUATION USING EPA DRAS

In accordance with EPA Region 6 requirements the analytical data for the samples were input into the Delisting Risk Assessment Software (DRAS), Version 2.0 for evaluation. This software program provides a scientifically defensible means to evaluate whether a RCRA listed waste qualifies for delisting under 40 CFR §260.20 and 260.22 with regard to toxicity. The program calculates carcinogenic and non-cancer risks associated with disposal of a petitioned waste to a landfill or surface impoundment. For the Shell Oil evaluation, a surface impoundment scenario was used since the *Landfill Leachate* will be treated in an impoundment, once delisted. The methods used to calculate chemical concentrations in media at the point of exposure are based on EPA's fate and transport mechanisms. The methods used to determine risk associated with the waste disposal scenarios evaluated for delisting a petitioned waste are based on EPA's risk assessment algorithms.

8.1 INPUT VALUES

In accordance with the EPA RCRA Delisting Technical Support Document, the following waste specific information was entered for the DRAS evaluation for both the primary and secondary leachate:

- waste volume: 14,000 tons/yr = 16,619 cy/yr (See Section 3.3)
- waste management unit: surface impoundment
- maximum concentration of VOAs detected (**Table 7-4**, primary and **Table 7-5**, secondary)
- maximum concentration of semivolatiles, pesticides, herbicides, PCBs, dioxins detected (**Table 7-4**, primary and **Table 7-5**, secondary)
- maximum concentration of metals detected (**Table 7-6**, primary and **Table 7-7**, secondary)
- acceptable cancer risk of 10^{-5}
- acceptable hazard index of 0.1
- multi-year delisting (default of 20 years)

The concentration data were entered as a "total" basis and TCLP basis since the waste streams are aqueous. Per EPA Region 6 instructions, the detection limit was entered for those constituents reported as below the detection limits. A separate DRAS run was performed for the primary and secondary leachate. The output files from the DRAS runs are presented in **Appendix F** and discussed below.