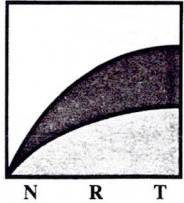


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# Natural Resource Technology, Inc.

## UST AND AST SITE INVESTIGATION REPORT

CITGO PETROLEUM CORPORATION  
9235 NORTH 107th STREET  
MILWAUKEE, WISCONSIN

Project No. 1096

Prepared for:

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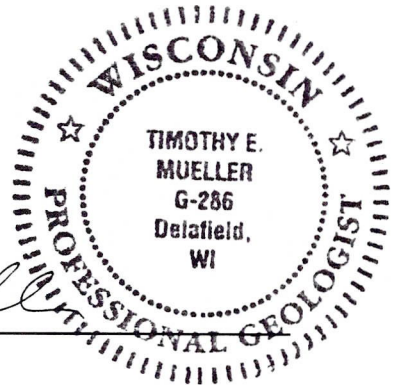
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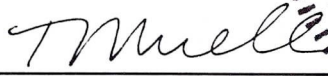
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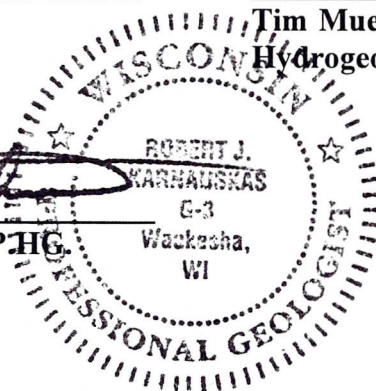
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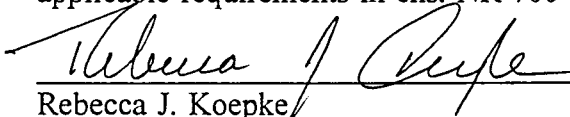
  
Rebecca J. Koepke  
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Principal Hydrogeologist




"I, Rebecca J. Koepke, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

  
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Rebecca J. Koepke  
Hydrogeologist

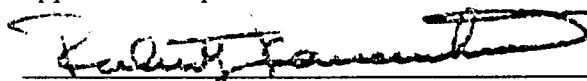
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Date

"I, Timothy E. Mueller, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

  
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Timothy E. Mueller  
Hydrogeologist

11-03-95  
Date

"I, Robert J. Karnauskas, hereby certify that I am a hydrogeologist as that term is defined in s. NR 712.03 (1), Wis. Adm. Code, and that, to the best of my knowledge, all of the information contained in this document is correct and the document was prepared in compliance with all applicable requirements in chs. NR 700 to 726, Wis. Adm. Code."

  
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Robert J. Karnauskas, P.G., P.HG.  
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11-03-95  
Date

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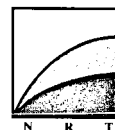
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**PLATE**

Plate 1	Site Layout
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## EXECUTIVE SUMMARY

This remedial investigation report summarizing site investigation work was prepared by Natural Resource Technology, Inc. (NRT) on behalf of CITGO Petroleum Corporation (CITGO) to conduct a site investigation for the CITGO Bulk Storage Terminal facility located at 9235 North 107th Street, Milwaukee, Wisconsin (site).

Previous investigations of the property were related to a 600-gallon gasoline spill in 1985 and an apparent leakage observed during the removal of two 20,000-gallon Underground Storage Tanks (USTs) (one ethanol tank and one diesel/gasoline "pourback" tank) in 1991. Twin City Testing Corporation (TCT) conducted an environmental assessment of the site in 1987 which included ten soil borings and installation of eight monitoring wells. Groundwater samples from two wells (adjacent to the former UST locations) contained concentrations of benzene and methyl tert-butyl ether (MTBE) in exceedence of state groundwater quality standards. Foth & Van Dyke (F&VD) assessed the soil quality on the southeast portion of the site in 1991 through the installation of seven soil borings. Monitoring wells which contained petroleum-related impacts in 1987 were resampled in 1991 and 1994 by F&VD and Dahl & Associates (Dahl), respectively. Continued impact concentrations in exceedence of state groundwater quality standards prompted further investigation for soil impacts and a source(s) for groundwater impacts.

Two areas of the CITGO property were evaluated for this investigation - the bermed aboveground storage tank area (AST area) and the UST area surrounding the fuel dispensing racks.

Soils encountered on the site generally consist of one to six feet of clay fill overlying clay till. The clay till is absent in the southwest corner of the property and increases to a thickness of approximately 16 feet in the borings performed in the eastern portion of the property. Sand and silty sand alluvium are encountered below the clay till. The water table was typically encountered 2.5 to 5 feet below ground surface during investigation activities. Groundwater flow in the AST area was generally east-southeast and generally southeast in the UST area.

In response to groundwater quality standard exceedences in former monitoring wells MW-1 and MW-2, NRT developed an investigation to assess potential impact source(s) and groundwater quality in the UST area. NRT's scope of investigation included a soil gas survey, soil borings to confirm possible source areas, construction of monitoring wells to assess groundwater quality and flow, and abandonment of monitoring wells which did not meet NR 141 standards.

The soil gas survey was developed to assess and focus on localized impacts which likely occur as localized "hot spots" in the upper clay till unit. A total of 44 soil vapor probes were installed on the property. The soil gas survey identified a "hotspot" directly south of the former UST excavation and the east end of the underground product piping trench. Three soil samples were analyzed from the "hotspot" area. One soil sample was taken from the area exhibiting the highest PID response (>2,500 ppm) and contained concentrations of benzene, ethylbenzene, toluene, and total xylene (58,000 ppb, 18,000 ppb, 48,000 ppb, and 87,000 ppb, respectively) in exceedence



of NR 720 Residual Contaminant Levels (RCLs) of 5.5 ppb, 2,900 ppb, 1,500 ppb, and 4,100 ppb, respectively. Two soil samples were collected from medium ranged PID areas (100 ppm to 1,000 ppm). The concentration of benzene, GRO, and DRO (170 ppb, 130 ppm, and 120 ppm, respectively) in one of the borings exceeded their respective RCLs (5.5 ppb, 100 ppm, and 100 ppm, respectively).

Six monitoring wells and two piezometers were installed in the UST area and six monitoring wells were constructed in the AST area to assess groundwater quality and to evaluate horizontal and vertical groundwater gradients and flow direction. Benzene and MTBE were detected in concentrations in exceedence of state groundwater quality standards in monitoring wells and one piezometer located down gradient of the UST area. Petroleum-related impacts in exceedence of state ground water quality standards were not detected in well samples located up-gradient of the UST area or within the bermed AST area.

All monitoring wells previously constructed on the property by TCT were abandoned and replaced with wells constructed are in accordance with NR 141 requirements.

Soil impacts appear to be limited to the southeast portion of the site just south of the fuel dispensing racks as described above. The extent of groundwater impacts has not been fully assessed. Additional down gradient monitoring wells and piezometers are recommended within the UST area.

Site investigation data indicates petroleum-related impacts are not presently of concern in the AST area. Further investigation in the AST area is not recommended.

## 1.0 INTRODUCTION

### 1.1 Overview

This remedial investigation report was prepared by Natural Resource Technology, Inc. (NRT) on behalf of CITGO Petroleum Corporation (CITGO) summarizing site investigation work performed at the CITGO Terminal facility property located at 9235 North 107th Street, Milwaukee, Wisconsin. The site is located in the SE 1/4 of the NE 1/4 of Section 6, Township 8N, Range 21E, Milwaukee County, Wisconsin (Figure 1).

The project contacts include the following:

#### Responsible Party:

CITGO Petroleum Corporation  
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At present, the site operates as a bulk fuel terminal storing and dispensing fuel oils, non-lead gasolines and ethanol from nine above ground storage tanks (ASTs) ranging in size from approximately 5 to 80,000 barrels. These ASTs are located in the west portion of the site with an earth berm. Fuel is dispensed from three fuel dispensing racks located in the eastern portion of the site. Two 20,000 gallon underground storage tanks (USTs) containing ethanol and diesel/gasoline were formerly located in the fuel dispensing rack area referred to in this report as the UST Area. Plate 1 shows the general present layout of the site.

In March, 1987, Twin City Testing Corporation (TCT) conducted an environmental assessment which consisted of the performance of ten soil borings and installation of eight monitoring wells (Plate 1). TCT's investigation indicated subsurface conditions consist of zero to 15 feet of clay till overlying sand and silty sand alluvium with the till thickness increasing to the east across the site. Groundwater occurs within 5 to 8 feet of the ground surface with flow in an easterly direction.

Field screening of soil samples showed no indications of the presence of volatile organic compounds (VOCs). Low levels of total petroleum hydrocarbons (TPH) characteristic of No. 2 fuel oil were detected in groundwater samples from several monitoring wells located in the UST Area. Gasoline constituents, as benzene and methyl tert-butyl ether (MTBE), were detected above NR 140 Groundwater Quality Enforcement Standards (ES) in groundwater samples collected from wells MW-1 and MW-2, both of which were located in the UST Area (Plate 1, Table 1).

Foth & Van Dyke (F&VD) conducted an evaluation of the southeast portion of the property in November, 1991 which consisted of the performance of seven additional borings. Soil samples were field screened for the presence of VOC's with a photoionization detector (PID). PID responses ranging from 600 to 932 parts per million (ppm) were observed in several borings in the 2.5 to 4 foot interval. Review of borings logs indicated PID responses decreased to background within 7 to 10 feet of the ground surface, indicating the depth of impacts is of limited extent. Comparison of PID readings with TPH, as gasoline range organics (GRO), analyses of soil samples showed a poor correlation with TPH values exceeding 300 ppm at sampling depths where no PID responses were observed. Similarly, poor correlation was also observed for TPH, as diesel range organics (DRO) results. The Wisconsin Department of Natural Resources (WDNR) abandoned the use of TPH analyses in the Leaking Underground Storage Tank (LUST) program due to the high values generally produced by the TPH method and false indications of the presence of petroleum hydrocarbons.

F&VD also resampled MW-2 (erroneously identified in their report as MW-1). The sample contained 1.9 ppb benzene. Benzene concentrations in MW-2 have decreased from 111 ppb in

1987 to 1.9 ppb in 1991. More recent sampling of monitoring wells MW-1 and MW-2 by Dahl & Associates on October 19, 1994 indicated a benzene concentration in MW-2 of 13 ppb. MTBE was also detected in samples collected from both wells (MW-1 and MW-2) at concentrations of 1,700 and 28 parts per billion (ppb), respectively.

The current available data provides a useful indication of the probable limited extent of horizontal and vertical petroleum hydrocarbon impacts. However, the data produced to-date does not reflect analytical protocols which are comparable to GRO and DRO soil quality standards under NR 720. In addition, the NR 140 ES exceedences of MTBE and, to a lesser extent, benzene warranted further evaluation of site subsurface.

## 1.2 Objectives

The objectives of the site investigation conducted by NRT were as follows:

- ◆ Evaluate the extent of impacted soil on the property through a soil gas survey in areas previous site information indicates releases may have occurred;
- ◆ Confirm the magnitude of these soil impacts, if present, with confirmatory borings; and
- ◆ Evaluate the probable magnitude and extent of groundwater impacts on-site with installation of monitoring wells and piezometers, and abandonment of existing wells not meeting current NR 141 requirements.

## **2.0 QUALITY ASSURANCE**

### **2.1 Investigation Procedures**

NRT has developed numerous technical Standard Practices to provide documentation of the use of widely recognized protocols and standards in the performance of all field operations. The list of Standard Practices and source documents are provided in Appendix A. Copies of these standard practices for relevant aspects of the field investigation can be provided to WDNR if review of these practices is necessary.

Field investigation procedures followed were in accordance with the Site Investigation Work Plan dated August 8, 1995. Deviations from the work plan are discussed within Section 3.0 (Site Investigation Results).

### **2.2 Equipment Decontamination**

The drilling subcontractor provide a steam cleaner for decontamination of the GeoProbe™, drill rig, drill augers used. Oils, greases, or other petroleum based products were not permitted on downhole equipment. Sampling equipment, including split-spoons, sampling spatulas, etc. were cleaned by thoroughly washing in Alconox detergent followed by triple rinses with distilled water prior to the collection of each sample.

### **2.3 Laboratory Quality Assurance**

Analysis of environmental media samples was performed by a laboratory certified by WDNR under NR 149. Soil and groundwater samples were analyzed for petroleum volatile organics (PVOCs) by U.S. EPA Method 8020, VOCs by U.S. EPA Method 8021, poly nuclear aromatic hydrocarbons (PAHs) by U.S. EPA Method 8310, total lead by 7420 or 239.2 and GRO and DRO by the Wisconsin Modified Methods. Duplicate and laboratory control trip blanks were also analyzed for applicable parameters as a quality control measure.

### 3.0 SITE INVESTIGATION RESULTS

The investigation was performed, evaluated and discussed as two separate areas: the AST area within the berm or dike and the UST area surrounding the fuel dispensing racks. Since monitoring well MW-112 was constructed between the two areas (down gradient of the AST area and upgradient of the UST area), the data collected from this well is included in both evaluations and subsequent discussions.

#### 3.1 Regional and Site Geology and Hydrogeology

##### 3.1.1 Regional Geology and Hydrology

The geology of the region consists of Paleozoic bedrock units of sedimentary deposits overlain by unconsolidated Quaternary glacial sediments. The regional bedrock strata is a sequence of Cambrian sandstone; Ordovician dolomite, sandstone, and shale; and Silurian dolomite. Precambrian crystalline rock underlies the sedimentary units. The Cambrian and Ordovician bedrock units have varying thicknesses, and each is the uppermost bedrock unit at various locations in the county. The bedrock units generally dip gently east-southeast.

The Quaternary deposits overlying the Cambrian, Ordovician, and Silurian sequence of bedrock units are unconsolidated and include: glacial till; glacial outwash sediments; ground and end moraine deposits; reworked stream and river sediments; and lake-basin sediments. These deposits consist of clays, silts, sands, gravels, cobbles, and boulders.

Three aquifer systems have been identified within the region. These three aquifers are: 1) the sand-and-gravel aquifer of the unconsolidated glacial deposits; 2) the Silurian dolomite (or Niagara) aquifer; and 3) the sandstone aquifers of the Ordovician and Cambrian rocks. The Galena-Platteville formation is the upper unit in the sandstone aquifer. The glacial deposits of the sand-and-gravel aquifer cover approximately half the county and are spread throughout. In the eastern part of the county, where the thickness of the glacial deposits may be as great as 300

feet, the sand-and-gravel aquifer can supply large quantities of water and can be rapidly recharged.

The Galena-Platteville formation is generally the upper bedrock unit. Water in the Galena-Platteville formation is under water table conditions in areas where the glacial sediments are either thin or absent. The Ordovician and Cambrian age sandstone aquifer underlies the entire county. Well yields in the sandstone aquifer range from less than 100 gallons per minute (gpm) to over 1,000 gpm. Most urban and high-capacity wells in the county obtain water from this aquifer.

### 3.1.2 Site Geology

Soils encountered on the site include generally consist of clay fill, clay till, sand, and silty sand. Cross sections illustrating soil lithologies are presented on Figures 2 and 3 (Sections A-A', B-B', C-C'). Generally, the ground surface is covered with concrete or asphalt in high traffic areas and gravel in the AST area. Surficial soils consisting of approximately 4 to 7 feet of clay fill. Zero to 10 feet of clay till underlies the clay fill. The clay till is not present in the southwest corner of the AST area and generally increases in thickness to the east. Alluvium, which generally grades from a sand to a silty sand is encountered below the till to the terminus of borings in which it is encountered. The alluvium is generally a fine grained sand grading to a fine grained silty sand with depth.

Bedrock under the site is Silurian dolomite and is estimated to occur at depths of approximately 100 to 200 feet.

### 3.1.3 Site Hydrogeology

Water level elevation measurements for existing monitoring wells and piezometers are presented on Table 2. The water table was typically encountered 3.5 to 5 feet below ground surface during investigation activities. Monitoring wells MW-101 through MW-105 (UST area) screen only the



clay till unit. Monitoring wells MW-106 through MW-112 (AST area) screen the upper portion of the sand alluvium and the clay till (if present).

Water table elevation contours for October 17, 1995 are shown on Figure 4. Horizontal groundwater flow in the AST area was to the east-southeast with a horizontal gradient of  $7.1 \times 10^{-3}$  feet/foot. In the UST area, flow is predominantly to the southeast with a horizontal gradient of  $1.5 \times 10^{-2}$  feet/foot. Calculations for the horizontal hydraulic gradients are presented in Appendix B.

Data collected from nested wells MW/PZ-101 and MW/PZ-102 were used to evaluate the depth of groundwater impacts and vertical hydraulic gradients in the UST area. An upward hydraulic gradient (flow direction) of  $3.8 \times 10^{-2}$  feet/foot was measured in well nest MW/PZ 101 and a downward gradient of  $3.8 \times 10^{-3}$  feet/foot was calculated in well nest MW/PZ-102. Calculations are presented in Appendix B.

### **3.2 Underground Storage Tank Area Investigation**

In response to groundwater quality standard exceedences in former monitoring wells MW-1 and MW-2, NRT developed an investigation to assess possible impact sources and groundwater quality in the UST area. NRT's scope of investigation included a soil gas survey, soil borings to confirm possible source areas, construction of monitoring wells to assess groundwater quality and flow, and abandonment of monitoring wells which did not meet NR 141 standards.

#### **3.2.1 Soil Gas Survey**

Previous investigative data collected by previous consultants, indicated large contiguous impacted areas are not present in the UST area. Therefore, the soil gas survey was performed to assess impacts which likely occur as localized "hot spots" in the upper clay till unit. VOCs, if present in soil, diffuse by volatilization through the soil pore spaces. These compounds can be detected in the soil gas if the source of the VOCs is within reasonable proximity to the sampling location,

which is dependent on subsurface conditions. The survey was limited to areas of known releases and fuel handling in the southeast portion of the property. The results of the soil gas survey were confirmed by analyses of soil samples collected from soil borings GP-1, SB-102, and SB-103.

A sampling grid was established in the southeast portion of the site (Figure 5) for installation of soil gas probes. The probes were initially installed on a larger grid spacing of approximately 20 to 25 feet. In areas of the grid where elevated (greater than 100 ppm) PID responses were detected, the grid spacing was reduced to determine the location(s) of maximum PID response suggesting the location of source areas. A total of 44 soil vapor probes were installed on the property. The probes remain in-place in the event additional future measurements from the probes are desired.

The aluminum tipped probes (approximately three inches in length) were placed below ground surface to a depth of approximately 5 feet in a 2-inch diameter hole installed with a GeoProbe™. Teflon™ tubing extended from the probe to the ground surface and sand was placed around the probes to approximately one foot below ground surface with bentonite placed to the surface to seal the probe annular space. Following several hours of equilibration of the soil, an evacuated Tedlar™ bag was connected to the tubing inside a vacuum box for sample extraction. Soil gas collected was analyzed with a PID equipped with a 10.6 eV lamp and calibrated with isobutylene to 100 ppm. Peak PID readings were recorded (Table 3) and plotted in the field (Figure 5).

The soil gas survey was performed on June 6 and 7, 1995. Peak PID field screening readings from the soil vapor probe are shown on Table 3. As illustrated on Figure 5, the PID concentrations peak directly south of the eastern end of the underground product piping trench (>2500 ppm relative to isobutylene) at vapor probe VP-22 and decrease rapidly (<100 ppm) 80 feet to the east (VP-2, VP-3, VP-44), 50 feet to the west (VP-14, VP-19, VP-41), and 40 feet to the south (VP-8, VP-9, VP-10). Vapor probes could not be extended directly north of VP-22 due to the proximity of the product piping trench. PID readings ranging from 500 ppm to 1,000 ppm (VP-7, VP-26, and VP-36) were detected directly south of the estimated location of the former USTs removed in 1991. PID readings from probes placed in the approximate area of the 600-

gallon gasoline spill (VP-1, VP-2, VP-6, VP-30, VP-31) were below 50 ppm. PID readings from probes (VP-3, VP-4, VP-5) placed east of the former UST excavation and the present AST area were less than 25 ppm.

### 3.2.2 Soil Borings and Soil Analytical Data

Based upon soil vapor probe field screening, the GeoProbe™ was used to extend two shallow soil borings (to 11 feet below ground surface) adjacent to VP-22 (PID >2,500 ppm) and VP-18 (PID 906 ppm). Soil boring logs and borehole abandonment forms are included in Appendix C. Soil samples were collected continuously in two foot intervals from one foot below ground surface. Soil samples were screened for the presence of VOCs with the PID using the WDNR jar headspace method. Soils encountered were clay and PID readings peaked in the 3 to 5 feet samples at 680 ppm (GP-1) and 230 ppm (GP-2). A soil sample from GP-1 (sampling depth 3 to 5 feet below ground surface) was analyzed for PVOCs, GRO, and DRO to assess the maximum impact concentrations in the survey area. Analytical data is summarized on Table 4 and the analytical report is included in Appendix D. Analytical results of sample GP-1 revealed that benzene, ethylbenzene, toluene and total xylenes (58,000 ppb, 18,000 ppb, 48,000 ppb and 87,000 ppb, respectively) concentrations exceeded NR 720 Residual Contaminant Levels (RCLs) of 5.5 ppb, 2,900 ppb, 1,500 ppb and 4,100 ppb, respectively.

On August 18, 1995 two soil borings (SB-102 and SB-103) were drilled in the area of the soil gas survey probes in which peak PID readings were between 500 to 1,000 ppm and 100 to 500 ppm, respectively, to collect soil samples for analyses within the impact area interpreted from the soil gas results (Figure 5). The borings are located approximately 20 to 30 feet west and southeast of GP-1 (respectively). Soil boring logs and borehole abandonment forms are included in Appendix C. The soil borings were drilled with hollow stem augers and samples were collected at a five foot sampling interval with a two foot split spoon sampler. The soil samples were collected from the 2.5 to 4.5 foot sampling interval. These samples were analyzed to assess the impact concentrations in the survey area within the vadose zone. Soil samples were analyzed for VOCs, total lead, GRO, DRO and PAHs.



Soil analytical data is summarized on Table 4. VOCs, GRO, DRO and lead were detected in both samples. PAHs were detected in the sample from SB-102 only. The benzene concentration in SB-102 (110 ppb) exceeded the RCL for benzene of 5.5 ppb. The concentration of benzene, GRO, and DRO (170 ppb, 130 ppm, and 120 ppm, respectively) in SB-103 exceeded their respective RCLs (5.5 ppb, 100 ppm, and 100 ppm, respectively). The results observed at SB-102 and SB-103 indicate that impact levels decrease rapidly (two order of magnitude decrease) at short distances from the impacted area identified by the soil gas survey.

### 3.2.3 Monitoring Wells and Piezometers

Six monitoring wells (MW-101 through MW-105 and MW-112) and two piezometers (PZ-101 and PZ-102) were installed in the UST area to assess groundwater quality and to evaluate horizontal and vertical groundwater gradients and flow direction in August 1995. Monitoring wells MW-101 through MW-105 screen the upper clay till only. Monitoring well MW-112 was constructed at a location where the upper clay till terminated approximately 6 feet below ground surface. Therefore, the well is screening the clay till and underlying alluvium. The piezometers (PZ-101 and PZ-102) were constructed in well nests with MW-101 and MW-102, respectively. The piezometers are screened 20 to 25 feet below the ground surface, within the silty sand alluvium. Soil boring logs, groundwater construction forms, and monitoring well development forms are presented in Appendix E.

#### 3.2.3.1 Soil Sampling Analytical Data

One soil sample from the vadose zone from each monitoring well was selected for laboratory analysis. Soil analytical samples were collected from 2.0 to 4.5 feet below ground surface and were analyzed for PAHs, VOCs, total lead, DRO and GRO. Soil analytical data is summarized on Table 4 and the analytical reports are presented in Appendix D.

All soil samples contained lead concentrations ranging from 12 (MW-102) to 82 ppm (MW-103). VOCs were not detected in any of the samples. Methylene chloride was detected in all soil

samples; however, this compound is a probable laboratory contaminant. Low concentrations of GRO and DRO were detected in soils from MW-103 and MW-104. Low concentrations of PAHs (<100 ppb) were detected in soil collected from borings MW-101, MW-102 and MW-103. Based on the above, no significant surface releases appear to have occurred at the locations of the monitoring well locations.

### 3.2.3.2 Groundwater Sampling Analytical Data

Groundwater samples were collected from the monitoring wells and piezometers in August 1995. In September 1995, a second round of samples were collected from monitoring wells which contained compound concentrations in exceedence of NR140 groundwater quality standards to confirm the initial analyses (MW-101, MW-102, MW-103 and PZ-101).

Groundwater samples were analyzed for PAHs, VOCs, total lead, DRO and GRO. Analytical data is summarized on Table 5 and analytical reports are included in Appendix F.

VOCs were detected in MW-101, MW-102, MW-103 and PZ-101. Benzene was detected in PZ-101 at concentrations of 55 and 230 ppb which exceed the NR 140 benzene ES of 5 ppb. MTBE was detected in all four well samples in concentrations (66, 130, 140 and 1,000 ppb, respectively) exceeding the NR 140 MTBE ES of 60 ppb. With the exception of samples collected from well MW-103, all samples exceeding NR 140 groundwater quality ESs were retrieved from wells downgradient of the fuel dispensing racks, former USTs and the release area identified from the soil gas survey. Samples collected from upgradient wells did not contain detectable concentrations of VOCs. The groundwater sample collected from well MW-103 did however contain an elevated concentrations of MTBE (140 and 80 ppb) which is believed to be the upgradient fringe of the plume. PAHs were not detected in any of the samples collected from the UST area. DRO was detected in all monitoring well samples at relatively low concentrations (0.2 to 0.6 ppm).

### 3.2.4 Microbial and Nutrient Analytical Data

Selective soil and groundwater samples from the UST area were analyzed for microbial and nutrient parameters for a preliminary assessment of in-situ bioremediation. The soil samples were collected from MW-102 (downgradient), MW-104 (upgradient), and SB-102 (within the impact area) from within the vadose zone. Groundwater samples were collected from MW-102 (down gradient), MW-103 (side-gradient), and MW-104 (up-gradient). Soil and groundwater analytical data is summarized on Tables 6 and 7, respectively. Laboratory reports are included in Appendix G.

Soil samples were separately analyzed for microbial colony forming units (cfu) for total populations and degrader populations for both diesel and weathered gasoline carbon sources. Soil characteristics analysis included percent air-filled pore space, percent moisture, percent water holding capacity, and moisture as percent water holding capacity. A general nutrient panel was performed which included:

- total kjeldahl nitrogen
- available potassium
- manganese
- Ph
- nitrogen as ammonia
- percent organic matter
- calcium
- sulfur as sulfate
- available phosphorous
- total organic carbon
- cation exchange capacity
- nitrogen as nitrate

Colony forming degraders and nutrients were evaluated for the groundwater samples.

#### 3.2.4.1 Soil Analysis

Overall, soil analysis revealed severe to moderate limitations which would likely require significant augmentation of site conditions for in-situ bioremediation. A preliminary assessment of data indicates these limiting conditions are due to high soil Ph (>8.5), the high ratio of total organic carbon to phosphorous (>120), and the low to moderate levels of degrader populations (<100 cfu/g and <100,000 cfu/g, respectively). Additional testing and evaluation is required for a complete assessment.

#### 3.2.4.2 Groundwater Analysis

Groundwater analysis indicates moderate to slight limitations for in-situ bioremediation. Degradable populations (diesel and weathered gasoline) were present in the upper moderate range of levels required for active in-situ bioremediation. Additional testing and evaluation is required for a complete assessment.

#### 3.2.5 Monitoring Well Abandonment

Two monitoring wells (MW-1 and MW-2) in the UST area were abandoned in accordance with NR 141. These wells were in poor condition and screened both the upper clay till and the underlying alluvium. It is believed the upper clay fill and clay till (when present) are a locally confining layer. Therefore, new water table wells and piezometers were constructed to screen the upper clay and underlying alluvium as described previously. Monitoring well abandonment forms are included in Appendix H.

### 3.3 Above Ground Storage Tank Area Investigation

Six monitoring wells (MW-106 through MW-112) were installed in the AST area to assess groundwater quality and to evaluate horizontal groundwater gradients and flow direction in August 1995. Monitoring wells MW-106 through MW-111 are constructed within the bermed AST area on the west half of the property and MW-112 is constructed east of the bermed area. The monitoring wells screen the upper clay till (if present) and the underlying alluvium.

#### 3.3.1 Soil Sampling Analytical Data

One soil sample from the vadose zone from each monitoring well was selected for laboratory analysis. Soil analytical samples were collected from 2.0 to 4.5 feet below ground surface and were analyzed for PVOCs and PAHs. Low concentrations of PVOCs (<10 ppb) were detected in MW-112. PVOCs were not detected in the remaining monitoring well samples. PAH

concentrations (9 to 980 ppb) were detected in soil samples from MW-109 (northwest corner) and MW-112 (east of berm). Of the PVOCs which currently have established RCLs (i.e. benzene, toluene, ethyl benzene and xylenes), none were detected in soil samples collected in the AST area borings. Subsequently, none of their respective RCLs were exceeded, nor near being exceeded. At present, RCLs for PAH compounds are not established in NR 720. Soil analytical data is summarized on Table 4 and the analytical reports are presented in Appendix D.

### 3.3.2 Groundwater Sampling Analytical Data

Groundwater samples were collected from the monitoring wells in August 1995. Groundwater samples were analyzed for PVOCs and PAHs. Groundwater analytical data is summarized on Table 5 and analytical reports are included in Appendix F.

VOCs were not detected in the AST monitoring wells. PAHs were detected MW-110 (north-central bermed area) only in low concentrations (<1 ppb). NR 140 groundwater quality standards were not attained or exceeded.

### 3.3.3 Monitoring Well Abandonment

Six monitoring wells (MW-3 and MW-8) in the AST area were abandoned in accordance with NR 141. These wells were in poor condition and were not constructed in accordance with current NR 141 requirements. Monitoring well abandonment forms are included in Appendix H.



## 4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of this investigation, the conclusions presented below are made by NRT.

### 4.1 Underground Storage Tank Area

Review of the soil gas survey data and soil sample analyses indicate that soil impacts above NR 720 RCLs are limited to the area south of the fuel dispensing racks and former USTs. The soil sample from boring GP-1 contained impacts concentrations which exceed NR 720 RCLs for benzene, ethylbenzene, toluene, total xylenes, GRO and DRO. Soil samples from borings SB-102 and SB-103 contained concentrations of benzene at significantly lower levels. GRO and DRO concentrations in SB-103 were less than 50 ppm above their respective RCLs. The impact levels observed in SB-102 and SB-103 indicate that impact levels decrease rapidly at short distances from the impacted area identified by the soil gas survey. Soil samples analyzed from outside of the impacted area (MW-101, MW-102, MW-103 and MW-104) did not contain petroleum-related impacts. However, the horizontal extent of impacts immediately to the north of the soil survey area was not evaluated due to the presence of buried product piping and the fuel dispensing racks. In-situ remediation of this soil may be difficult due to the severe to moderate limitations which would likely require significant augmentation of site conditions for in-situ bioremediation.

Benzene concentrations in exceedence of the NR 140 ESs were detected in samples collected from well PZ-101 only. MTBE concentrations in exceedence of NR 140 ESs were detected in wells (MW-101, MW-102 and PZ-101) located downgradient of the soil impact area and also in samples collected from side gradient well MW-103. Based on the analytical results, impacts to groundwater are present in the clay till and the underlying sand (alluvium) unit. Groundwater impacts appear to be migrating to the south-southeast and may potentially be present off-site. Subsequently, the downgradient extent of groundwater impact has not been completely defined. NRT recommends that one additional well nest (one water table well and one piezometer) be installed off-site to the southeast (downgradient) to delineate the lateral extent of groundwater impact detected during this investigation. In order to determine the vertical extent of VOC

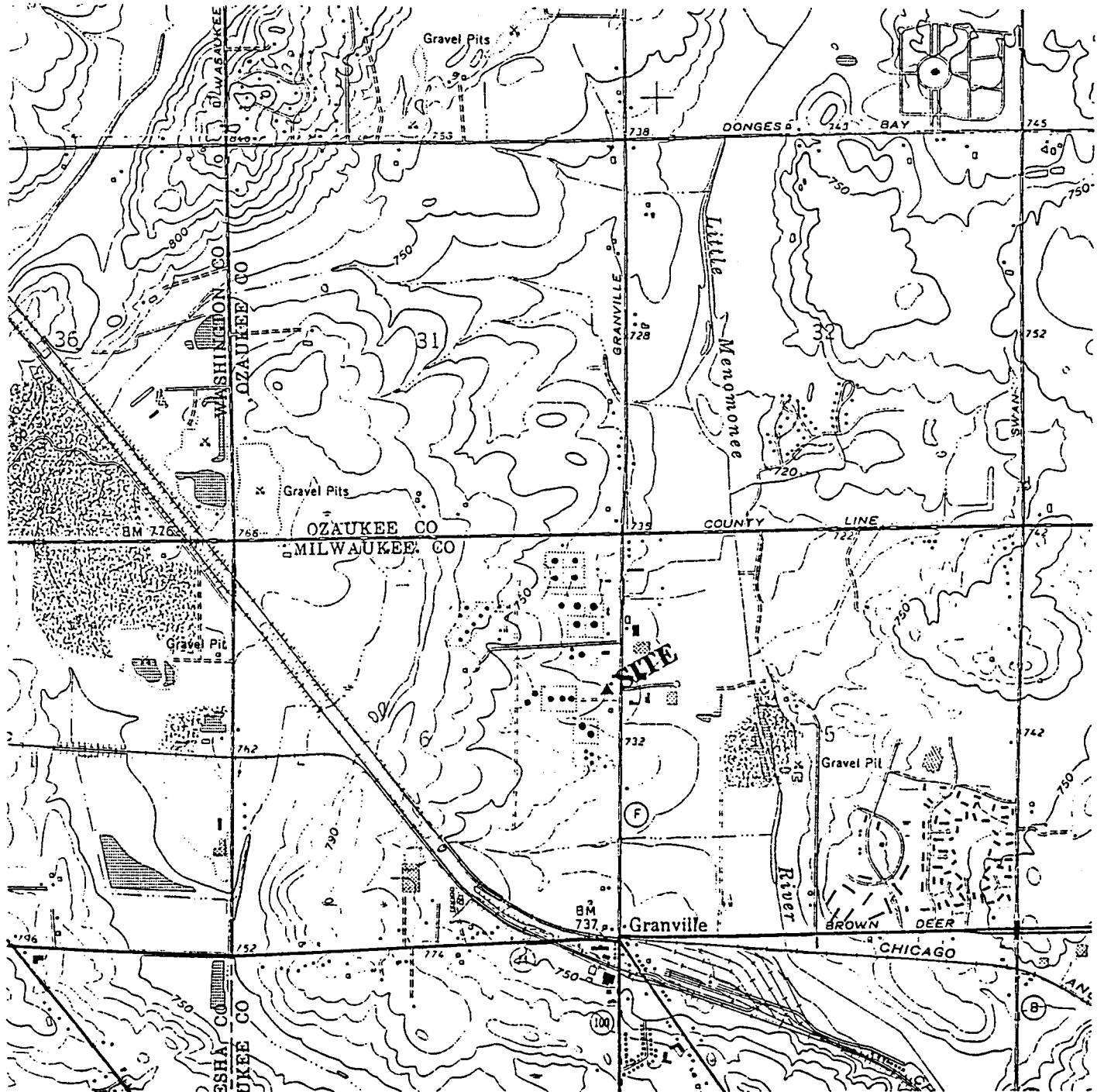
impact, the installation and sampling of a deeper on-site piezometer should also be considered. In addition, a well survey should be conducted to identify off-site well uses within a one-mile radius. Following the collection and evaluation of the additional recommended data, remedial alternatives should be evaluated and proposed to the WDNR as specified in NR 722.

#### **4.2 Above Ground Storage Tank Area**

Data collected during this site investigation did not identify petroleum-related impacts of concern in the AST area. Further investigation of the AST area is not recommended.

## 5.0 REFERENCES

- Dahl & Associates, Inc., 1995. Groundwater Monitoring Laboratory Results. CITGO Petroleum Terminal, Milwaukee, Wisconsin. Letter report date January 31, 1995, addresses to Mr. Scott Buckner.
- Foth & Van Dyke, 1991. Phase II Environmental Site Assessment, 9235 North 107th Street, Milwaukee, Wisconsin. Report dated November 18, 1991.
- Foth & Van Dyke, 1992. Addendum to Foth & Van Dyke Report Titled "Phase II 9235 North 107th Street, Milwaukee, Wisconsin. Letter report dated January 13, 1992.
- Natural Resource Technology, Inc., 1995. Site Investigation Work Plan, Citgo Petroleum Corporation, 9235 North 107th Street, Milwaukee, Wisconsin. Report dated August 8, 1995.
- Twin City Testing Corporation, 1987. Environmental Assessment, Jacobus Oil Company, Granville Terminal, 9301 North 107th Street, Milwaukee, Wisconsin. Report dated March 18, 1987.
- Zimpro Environmental & Energy Systems, 1987. Letter dated March 213, 1987 and addressed to Mr. Bob Levra (Twin City Testing).



SOURCE: USGS 7.5 MINUTE QUADRANGLE,  
 MENOMONEE FALLS. DATED 1958.  
 PHOTOREVISED 1971 AND 1976.



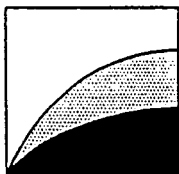
QUADRANGLE LOCATION



0 2000 4000

SCALE IN FEET

CONTOUR INTERVAL 10 FEET



N R T

Natural  
 Resource  
 Technology

SITE LOCATION MAP

CITGO TERMINAL  
 MILWAUKEE, WISCONSIN

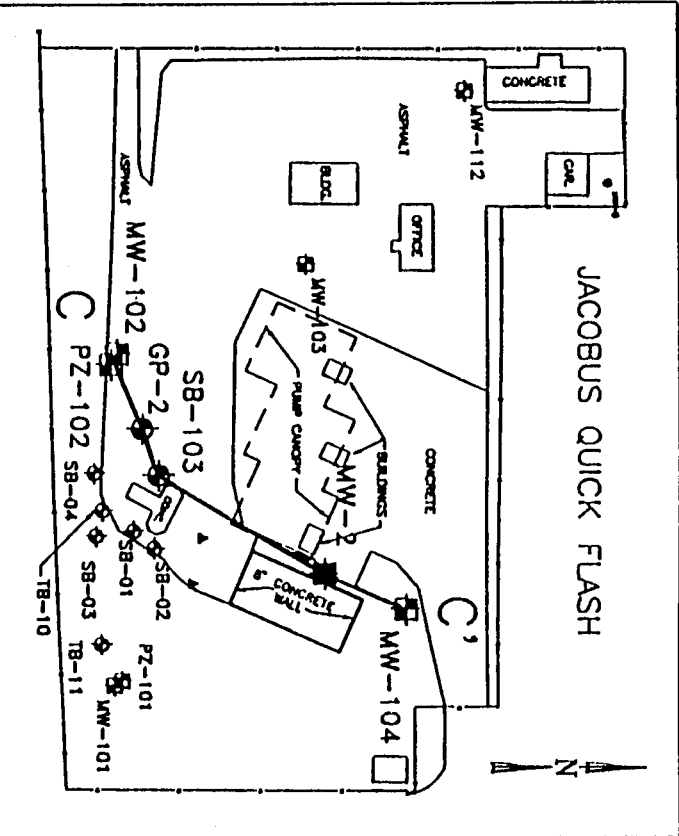
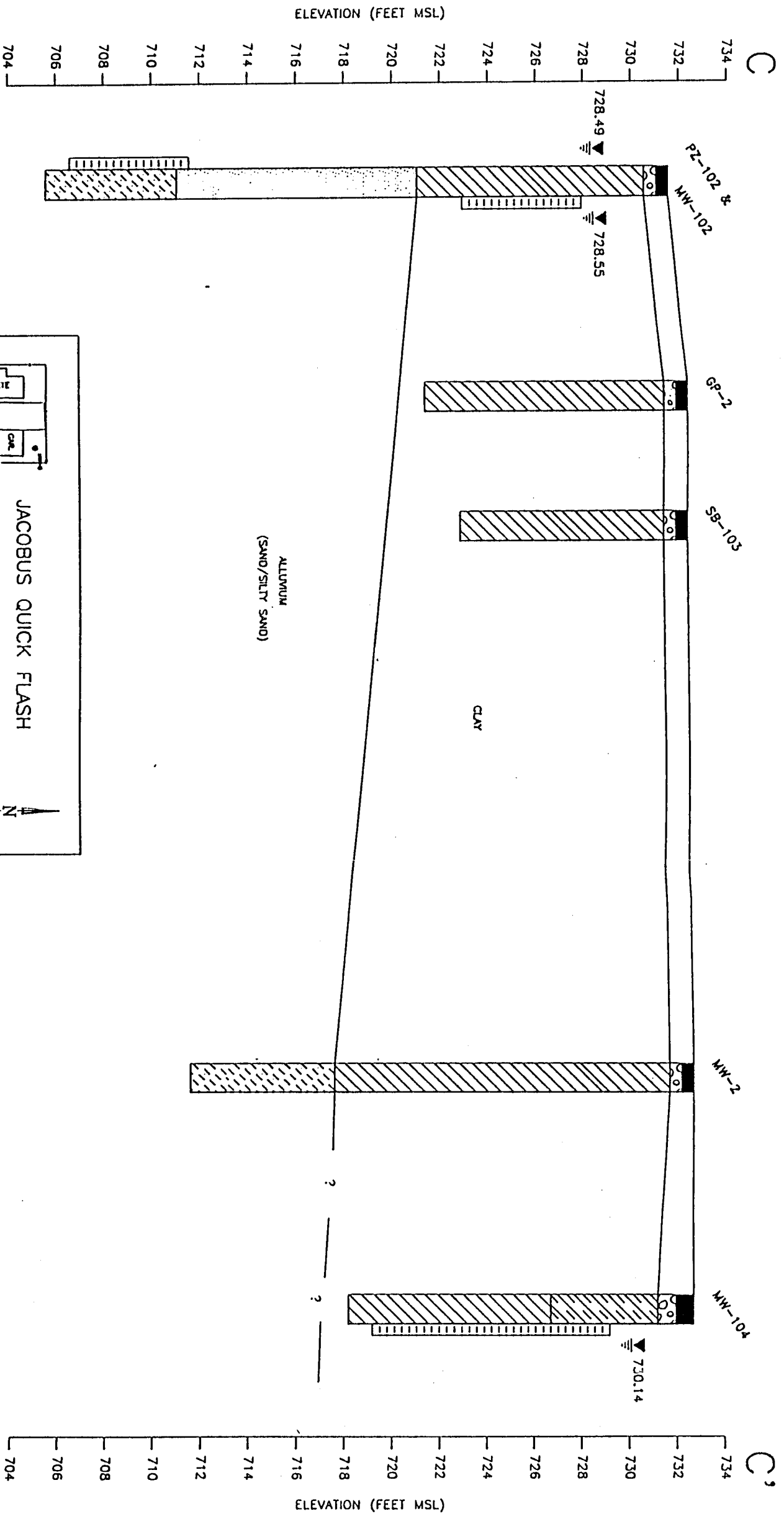
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PROJECT NO.  
 1096

DRAWING NO.  
 1096-A1

FIGURE NO.  
 1



LEGEND

- SAND
- CLAY
- SANDY CLAY/CLAYEY SAND
- SILTY CLAY/CLAYEY SILT
- SILTY SAND/SANDY SILT
- SILT
- GRAVEL
- ASPHALT
- SCREENED INTERVAL

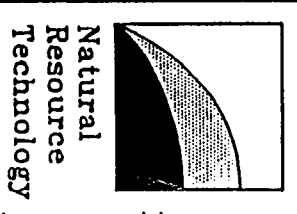


729.69' WATER TABLE ELEVATION ON OCTOBER 16, 1995

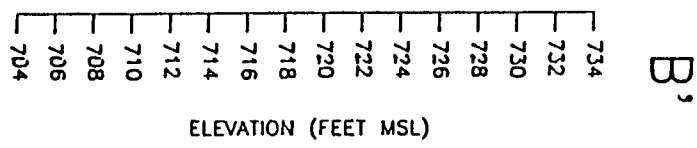
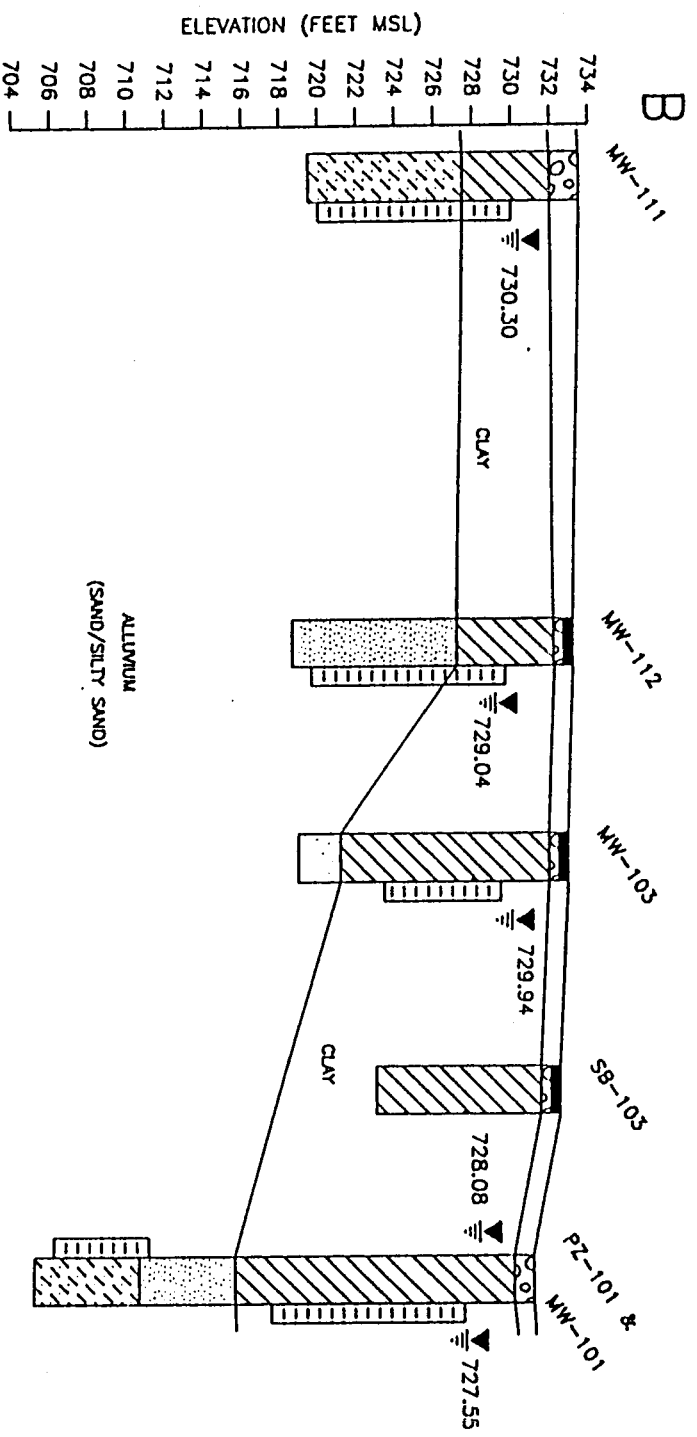
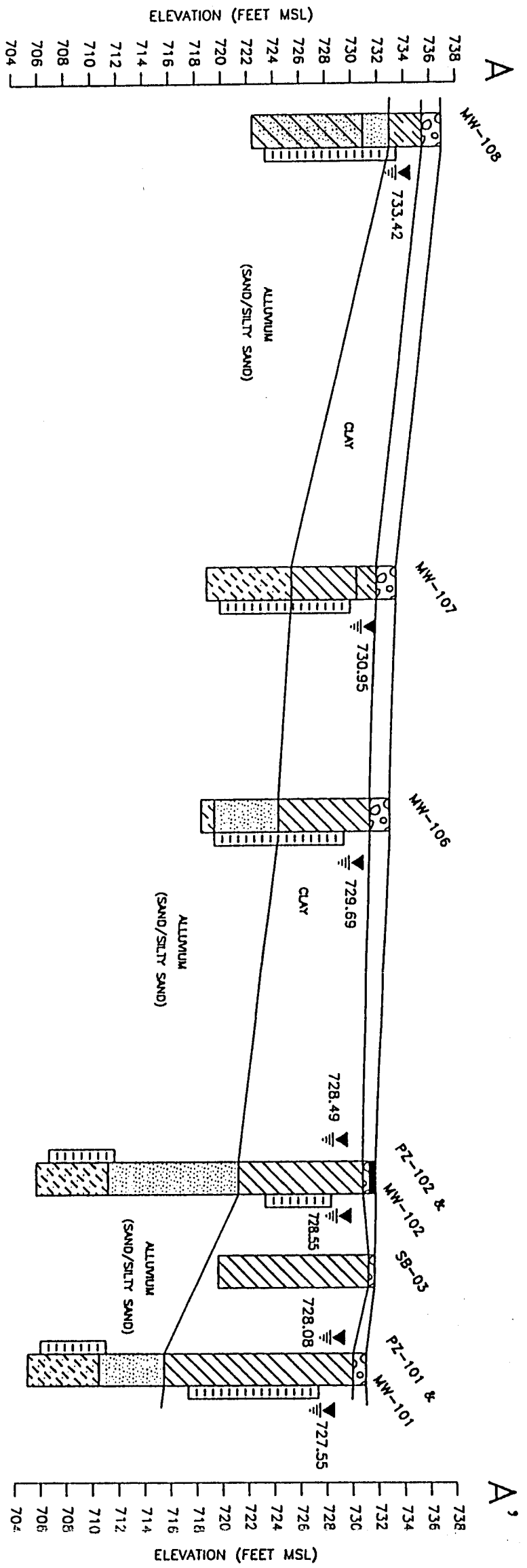
GEOLOGIC CROSS SECTION C - C'

CITGO PETROLEUM BULK TERMINAL  
9235 NORTH 107TH STREET  
MILWAUKEE, WISCONSIN

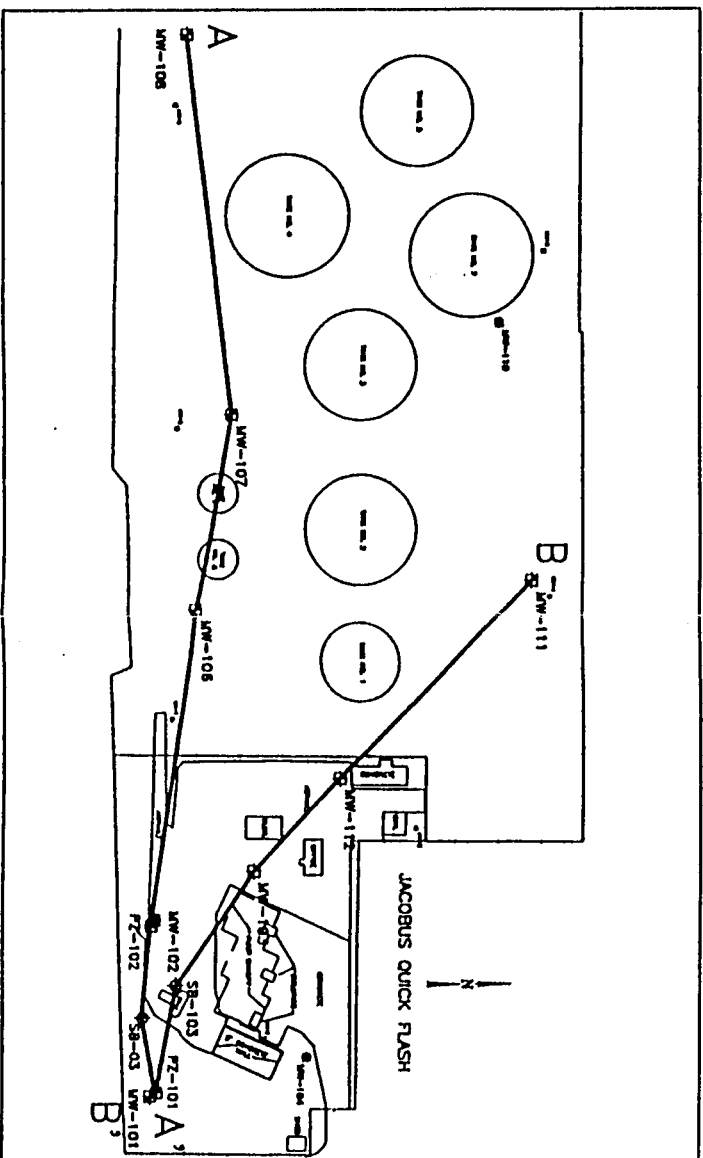
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PROJECT NO. 1096/7N  
DRAWING NO. 1096-B04  
FIGURE NO. 3



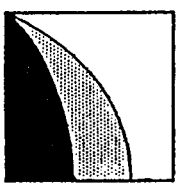
- LEGEND**
- SAND
  - CLAY
  - SILTY CLAY/CLAYEY SILT
  - SILTY SAND/SANDY SILT
  - SANDY CLAY/CLAYEY SAND
  - SILT
  - GRAVEL
  - ASPHALT
  - WATER TABLE ELEVATION ON OCTOBER 16, 1995
  - SCREENED INTERVAL



**GEOLOGIC CROSS SECTIONS  
A - A' AND B - B'**  
CITGO PETROLEUM BULK TERMINAL  
9235 NORTH 107TH STREET  
MILWAUKEE, WISCONSIN

DRAWN BY: TAS	DATE: 10/26/95
CHECKED BY: BSK	DATE: 10/26/95
APPROVED BY: TEM	DATE: 10-26-95
AUTOCAD FILE: 1096-B05	

Natural Resource Technology



PROJECT NO. 1096/7N  
DRAWING NO. 1096-B05

FIGURE NO. 2

**Table 1**  
**Abandoned Monitoring Wells Groundwater Analytical Summary**

**Citgo Bulk Petroleum Terminal**  
**9235 North 107th Street, Milwaukee, WI**

Monitoring Location	Sample Date	Volatile Organics Compounds (VOCs)							Total Petroleum Hydrocarbons	
		Benzene (ug/L)	Ethyl-benzene (ug/L)	Toluene (ug/L)	Total Xylenes (ug/L)	Methyl-t butyl ether (ug/L)	1,2,4-Trimethyl-benzene (ug/L)	1,3,5-Trimethyl-benzene (ug/L)	Gasoline (ug/L)	#2 Fuel Oil (ug/L)
MW-1	Feb-87	3	nd	2	84	na	na	na	95	200
	19-Mar-87	26.5	nd	nd	2.6	na	na	na	nd	nd
	26-Nov-91	nd	nd	nd	nd	1000	na	na	1500	nd
	19-Oct-94	nd	nd	nd	nd	1700	na	na	na	na
MW-2	Feb-87	111	nd	1	14	na	na	na	130	nd
	19-Mar-87	2.4	nd	nd	nd	na	na	na	nd	nd
	26-Nov-91	nd	nd	nd	nd	37	na	na	nd	nd
	19-Oct-94	13	2.5	nd	11.7	28	3.2	na	na	na
MW-3	Feb-87	na	na	na	na	na	na	na	na	600
	19-Mar-87	nd	nd	nd	nd	na	na	na	nd	nd
MW-4	Feb-87	nd	nd	nd	nd	na	na	na	nd	nd
	19-Mar-87	nd	nd	nd	nd	na	na	na	nd	nd
MW-5	Feb-87	na	na	na	na	na	na	na	na	700
	19-Mar-87	na	na	na	na	na	na	na	na	na
MW-6	Feb-87	nd	nd	nd	22	na	na	na	24	200
	19-Mar-87	nd	nd	nd	nd	na	na	na	nd	nd
MW-7	Feb-87	na	na	na	na	na	na	na	na	300
	19-Mar-87	nd	3.6	nd	14.5	na	na	na	130	nd
MW-8	Feb-87	na	na	na	na	na	na	na	na	nd
	19-Mar-87	nd	nd	nd	nd	na	na	na	nd	nd
<b>Wisconsin Groundwater Quality Standards (NR 140.10)</b>										
<b>Preventive Action Limit (PAL)</b>		<b>0.5</b>	<b>140</b>	<b>68.6</b>	<b>124</b>	<b>12</b>	<b>ne</b>	<b>ne</b>	<b>ne</b>	<b>ne</b>
<b>Enforcement Standard (ES)</b>		<b>5</b>	<b>700</b>	<b>343</b>	<b>620</b>	<b>60</b>	<b>ne</b>	<b>ne</b>	<b>ne</b>	<b>ne</b>

nd: Not detected at or above the laboratory method detection limit as reported in the laboratory analytical report  
**30** Preventive Action Limit exceedance concentrations are in bold and are boxed.  
**230** Enforcement Standard exceedance concentrations are in bold and are boxed and shaded.

ne: Groundwater quality standards have not been established for this compound.  
na: Not analyzed.

**Table 2**  
**Monitoring Well Information and Groundwater Elevation Data**

**Citgo Bulk Petroleum Terminal**  
**9235 North 107th Street, Milwaukee, WI**

<b>Monitoring Location</b>	<b>Ground Surface Elevation (MSL)</b>	<b>Top of Casing Elevation (MSL)</b>	<b>Monitoring Date</b>	<b>Depth to Water (feet)</b>	<b>Groundwater Elevation (feet)</b>
<b>Water Table Observation Wells</b>					
MW-101	730.66	733.23	25-Aug-95	14.47	718.76
			16-Oct-95	5.68	727.55
MW-102	731.60	731.14	25-Aug-95	2.63	728.51
			16-Oct-95	2.59	728.55
MW-103	732.78	732.44	25-Aug-95	2.49	729.95
			16-Oct-95	2.50	729.94
MW-104	732.71	735.06	25-Aug-95	10.57	724.49
			16-Oct-95	4.92	730.14
MW-105	730.38	729.88	25-Aug-95	10.11	719.77
			16-Oct-95	2.90	726.98
MW-106	732.79	735.50	28-Aug-95	3.81	731.69
			16-Oct-95	5.81	729.69
MW-107	733.30	736.31	29-Aug-95	3.45	732.86
			16-Oct-95	5.36	730.95
MW-108	736.90	739.82	29-Aug-95	3.48	736.34
			16-Oct-95	6.40	733.42
MW-109	734.28	737.14	28-Aug-95	4.61	732.53
			16-Oct-95	3.61	733.53
MW-110	734.48	736.97	29-Aug-95	3.51	733.46
			16-Oct-95	4.87	732.10
MW-111	733.48	736.00	25-Aug-95	5.86	730.14
			16-Oct-95	5.70	730.30
MW-112	733.09	732.62	28-Aug-95	3.64	728.98
			16-Oct-95	3.58	729.04
<b>Piezometers</b>					
PZ-101	730.96	733.40	25-Aug-95	5.38	728.02
			16-Oct-95	5.32	728.08
PZ-102	731.60	731.21	28-Aug-95	2.90	728.31
			16-Oct-95	2.72	728.49

na: not applicable  
msl: Elevations are referenced to the USGS mean sea level datum



**Table 3  
Soil Vapor Probe PID Analysis Summary**

**Citgo Bulk Petroleum Terminal  
9235 North 107th Street, Milwaukee, WI**

Vapor Monitoring Location	Probe Depth (feet)	Sampling Date	PID Reading (ppm*)
VP-1	5	06/06/95	21
VP-2	5	06/06/95	9.3
VP-3	5	06/06/95	3.3
VP-4	5	06/06/95	3.8
VP-5	5	06/06/95	24
VP-6	5	06/06/95	47
VP-7	5	06/06/95	689
VP-8	5	06/06/95	10
VP-9	5	06/06/95	89
VP-10	5	06/06/95	9.1
VP-11	5	06/06/95	34
VP-12	3	06/06/95	3.7
VP-13	5	06/06/95	6.8
VP-14	5	06/06/95	21
VP-15	5	06/06/95	349
VP-16	5	06/06/95	1739
VP-17	5	06/06/95	703
VP-18	5	06/06/95	906
VP-19	3	06/06/95	56
VP-20	5	06/06/95	110
VP-21	5	06/06/95	1634
VP-22	5	06/06/95	>2500

Vapor Monitoring Location	Probe Depth (feet)	Sampling Date	PID Reading (ppm*)
VP-23	5	06/06/95	129
VP-24	5	06/06/95	153
VP-25	5	06/06/95	190
VP-26	5	06/06/95	768
VP-27	3	06/07/95	67
VP-28	5	06/06/95	30
VP-29	5	06/06/95	29
VP-30	5	06/06/95	10
VP-31	5	06/06/95	3
VP-32	5	06/07/95	963
VP-33	5	06/07/95	519
VP-34	5	06/07/95	1338
VP-35	5	06/07/95	1143
VP-36	5	06/07/95	1105
VP-37	5	06/07/95	718
VP-38	5	06/07/95	168
VP-39	5	06/07/95	47
VP-40	5	06/07/95	10
VP-41	5	06/07/95	33
VP-42	5	06/07/95	418
VP-43	5	06/07/95	385
VP-44	5	06/07/95	65

PID: Photoionization detector, IS-3000 Microtip with 10.6 eV lamp calibrated to 100 ppm isobutylene  
 ppm\*: PID readings are relative to isobutylene

**Table 4  
Soil Analytical Summary**

**Citgo Bulk Petroleum Terminal  
9235 North 107th Street, Milwaukee, WI**

Monitoring Location	Sample Depth (feet)	Sample Date	Volatile Organic Compounds (VOCs) (ug/Kg)										Total Lead (mg/Kg)	Gasoline Range Organics (mg/Kg)	Diesel Range Organics (mg/Kg)		
			Benzene	Ethyl-benzene	Toluene	Total xylenes	Iso-propyl-benzene	1,3,5-Trimethyl-benzene	1,2,4-Trimethyl-benzene	Methyl tertiary butyl ether	sec-Butyl-benzene	n-Butyl-benzene				Methylene chloride	
<b>UST AREA SOIL SAMPLES</b>																	
GP-1	2.0-4.0	07-Jun-95	5800	18000	48000	87000	nd	14000	45000	890	na	na	na	na		670	120
SB-102	2.5-4.5	18-Aug-95	110	nd	nd	nd	nd	nd	nd	nd	nd	nd	8	23	24	11	
SB-103	2.5-4.5	18-Aug-95	170	490	64	1683	110	950	2200	nd	430	620	10	37	130	120	
MW-101	2.0-4.0	16-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	9	37	nd	nd	
MW-102	2.0-4.0	17-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	9	12	nd	nd	
MW-103	2.0-4.0	17-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	9	82	6.9	5.5	
MW-104	2.5-4.5	18-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	9	35	14	6.3	
MW-105	2.0-4.0	16-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	10	19	nd	nd	
<b>AST AREA SOIL SAMPLES</b>																	
MW-106	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na	na
MW-107	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na	na
MW-108	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na	na
MW-109	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na	na
MW-110	2.5-4.5	23-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na	na
MW-111	2.5-4.5	24-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	na	na	na	na	na	na	na
MW-112	2.5-4.5	18-Aug-95	nd	nd	nd	nd	nd	2	8	nd	na	na	na	na	na	na	na
<b>WDNR Soil Residual Contaminant Levels (RCLs)</b>																	
RCLs (Industrial)			5.5	2900	1500	4100	ne	ne	ne	ne	ne	ne	ne	500	100	100	

Table 4 continued...  
Soil Analytical Summary

Monitoring Location	Sample Depth (feet)	Sample Date	UST AREA SOIL SAMPLES													
			Anthra-cene (ug/Kg)	Benzo (a) anthra-cene (ug/Kg)	Benzo (a) pyrene (ug/Kg)	Benzo (b) Fluor-anthene (ug/Kg)	Benzo (k) Fluor-anthene (ug/Kg)	Benzo (ghi) perylene (ug/Kg)	Chrysene (ug/Kg)	Fluor-anthene (ug/Kg)	Fluorene (ug/Kg)	Naph-thalene (ug/Kg)	1-Methyl-naph-thalene (ug/Kg)	2-Methyl-naph-thalene (ug/Kg)	Phen-anthrene (ug/Kg)	Pyrene (ug/Kg)
GP-1	2.0-4.0	07-Jun-95	na	na	na	na	na	na	na	na	na	na	na	na	na	na
SB-102	2.5-4.5	18-Aug-95	1	nd	2	5	2	nd	nd	19	34	110	65	65	23	nd
SB-103	2.5-4.5	18-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-101	2.0-4.0	16-Aug-95	nd	5	6	8	3	nd	8	11	nd	0.9	0.5	0.4	4	10
MW-102	2.0-4.0	17-Aug-95	nd	0.3	0.1	0.8	0.2	nd	nd	nd	nd	nd	nd	nd	1	1
MW-103	2.0-4.0	17-Aug-95	nd	0.9	nd	nd	nd	0.9	1	2	nd	nd	nd	nd	2	2
MW-104	2.5-4.5	18-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-105	2.0-4.0	16-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
AST AREA SOIL SAMPLES																
MW-106	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-107	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-108	2.5-4.5	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-109	2.5-4.5	25-Aug-95	23	330	230	290	120	57	560	760	nd	nd	nd	nd	250	690
MW-110	2.5-4.5	23-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-111	2.5-4.5	24-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
MW-112	2.5-4.5	18-Aug-95	nd	nd	11	23	9	nd	nd	nd	nd	510	580	980	nd	nd

na: not analyzed  
 ne: A standard has not been established for this compound  
 nd: not detected at or above laboratory method detection limit as reported in the laboratory analytical report included as Appendix D.

ug/Kg: micrograms per kilogram which is equivalent to parts per billion  
 mg/Kg: milligram per kilogram which is equivalent to parts per million

Constituent concentration exceeded RCL



## Groundwater Analytical Summary

**Citgo Bulk Petroleum Terminal  
9235 North 107th Street, Milwaukee, WI**

Monitoring Location	Sample Date	Volatile Organics Compounds (VOCs) (ug/L)								Polynuclear Aromatic Hydrocarbons (PAHs) (ug/L)				Diesel Range Organics (mg/L)	Gasoline Range Organics (mg/L)
		Benzene	Ethyl-benzene	Toluene	Total Xylenes	Methyl-t butyl ether	1,1-Dichloro-ethane	1,1,1-Trichloro-ethane	Di-isopropyl ether	Anthra-cene	Benzo (a) anthracene	Chrysene	Phenan-threne		
<b>UST Area Monitoring Well Samples</b>															
MW-101	25-Aug-95	nd	nd	nd	nd	30	1.0	3.0	nd	nd	nd	nd	nd	0.5	nd
	21-Sep-95	nd	nd	nd	nd	66	na	na	na	na	na	na	na	na	na
PZ-101	25-Aug-95	55	nd	nd	nd	nd	46	15	430	nd	nd	nd	nd	0.5	0.2
	21-Sep-95	230	nd	nd	nd	1000	na	na	na	na	na	na	na	na	na
MW-102	25-Aug-95	nd	nd	nd	nd	130	nd	nd	nd	nd	nd	nd	nd	0.4	nd
	21-Sep-95	nd	nd	nd	nd	94	na	na	na	na	na	na	na	na	na
PZ-102	28-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.2	nd
MW-103	25-Aug-95	nd	nd	nd	nd	140	nd	nd	nd	nd	nd	nd	nd	0.6	nd
	21-Sep-95	nd	nd	nd	nd	80	na	na	na	na	na	na	na	na	na
MW-104	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.6	nd
MW-105	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.4	nd
MW-112	28-Aug-95	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
<b>AST Area Monitoring Well Samples</b>															
MW-106	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW-107	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW-108	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW109	28-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW-110	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	0.08	0.03	0.03	1	na	na
MW-111	28-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
<b>Quality Assurance / Quality Control Samples</b>															
MW-DD	29-Aug-95	nd	nd	nd	nd	nd	na	na	na	nd	nd	nd	nd	na	na
MW-ZZ	25-Aug-95	nd	nd	nd	nd	nd	nd	nd	130	nd	nd	nd	nd	0.6	0.6
<b>Wisconsin Groundwater Quality Standards (NR 140.10)</b>															
Preventive Action Limit (PAL)		0.5	140	68.6	124	12	85	40	ne	ne	ne	ne	ne	ne	ne
Enforcement Standard (ES)		5	700	343	620	60	850	200	ne	ne	ne	ne	ne	ne	ne

na: not analyzed

ne: Groundwater quality standards have not been established for this compound

30 Preventive Action Limit exceedance concentrations are in bold and are boxed.

230 Enforcement Standard exceedance concentrations are in bold and are boxed and shaded.

nd: not detected at or above laboratory method detection limit as reported in the laboratory analytical report included as Appendix D.

MW-DD: Field duplicate for MW-108

MW-ZZ: Field duplicate for MW-103

**Table 6  
Soil Nutrient and Microbial Analytical Summary**

**Citgo Bulk Petroleum Terminal  
9235 North 107th Street, Milwaukee, WI**

Sampling Location	Sampling Depth (feet)	Sampling Date	Total Kjeldahl Nitrogen (ppm)	Nitrogen as Ammonia (ppm)	Available Phosphorous (ppm)	Available Potassium (ppm)	% Organic Matter	Total Organic Carbon (ppm)	C:N		Manganese (ppm)	Calcium (ppm)	Cation Exchange Capacity (Meq/100g)	pH	Sulfur as Sulfate (ppm)	Nitrogen as Nitrate (ppm)
									C:N	C:P						
MW-102	2.0-4.0	17-Aug-95	234	2.5	<1	105	0.4	1560	7	>1560	nr	nr	nr	8.6	nr	nr
MW-104	2.5-4.5	18-Aug-95	176	3.5	1	70	0.3	1170	7	1170	nr	nr	nr	8.7	nr	nr
SB-102	2.5-4.5	18-Aug-95	96	3	<1	65	0.3	1170	13	>1170	nr	nr	nr	8.8	nr	nr

Sampling Location	Sampling Depth (feet)	Total Populations			Weathered Gasoline Carbon Source Degradable Populations			Diesel Carbon Source Degradable Populations		
		Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)
MW-102	2.0-4.0	1.91E+04	1.78E+04	2.06E+04	1.27E+04	1.17E+04	1.38E+04	1.39E+04	1.26E+04	1.51E+04
MW-104	2.5-4.5	7.33E+03	6.61E+03	8.13E+03	6.22E+04	5.54E+04	6.95E+04	6.59E+04	5.87E+04	7.36E+04
SB-102	2.5-4.5	1.66E+05	1.55E+05	1.78E+05	5.05E+00	1.05E+00	3.82E+00	2.17E+02	1.14E+02	3.86E+02
Marginal Inoculum		na	na	na	na	1.00E+01	1.00E+03	na	1.00E+01	1.00E+03
Inoculum Levels		na	na	na	na	1.00E+03	1.00E+06	na	1.00E+03	1.00E+06
Active Degradation Level		na	na	na	na	1.00E+06	1.00E+09	na	1.00E+06	1.00E+09

Notes:

- na: Not applicable.
- nr: Analysis not requested.
- C:N: Ratio of Total Organic Carbon (TOC) to Nitrogen.
- C:P: Ratio of Total Organic Carbon (TOC) to Phosphorous.
- : Degradable populations present at levels required for active degradation.
- : Degradable populations present at levels which would require augmentation for active degradation.

**Table 7  
Groundwater Nutrient and Microbial Analytical Summary**

**Citgo Bulk Petroleum Terminal  
9235 North 107th Street, Milwaukee, WI**

Sampling Location	Sampling Date	Total Kjeldahl Nitrogen (ppm)	Nitrogen as Ammonia (ppm)	Available Phosphorous (ppm)	Available Potassium (ppm)	% Organic Matter	Total Organic Carbon (ppm)	C:N	C:P	Manganese (ppm)	Calcium (ppm)	Cation Exchange Capacity (Meq/100g)	pH	Sulfur as Sulfate (ppm)	Nitrogen as Nitrate (ppm)
MW-102	29-Aug-95	1	<0.5	0.2	6	nr	nr	nr	nr	nr	nr	nr	7.5	nr	1
MW-103	29-Aug-95	14	<0.5	0.2	4	nr	nr	nr	nr	nr	nr	nr	7.5	nr	<0.5
MW-104	29-Aug-95	4	<0.5	0.1	3.5	nr	nr	nr	nr	nr	nr	nr	7.8	nr	<0.5
WDNR Minimum Guidelines		ne	ne	ne	ne	ne	ne	<40	<120	ne	ne	ne	ne	ne	ne
NAS Minimum Guidelines		ne	ne	ne	ne	ne	ne	<6	<30	ne	ne	ne	ne	ne	ne

Sampling Location	Sample Date	Total Populations			Weathered Gasoline Carbon Source Degradation Populations			Diesel Carbon Source Degradation Populations		
		Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)	Mean (cfu/gm)	Low (cfu/gm)	High (cfu/gm)
MW-102	29-Aug-95	1.61E+06	1.50E+06	1.72E+06	1.15E+06	1.06E+06	1.26E+06	1.39E+04	1.26E+04	1.51E+04
MW-103	29-Aug-95	8.92E+05	8.01E+05	9.89E+05	1.93E+05	1.79E+05	2.08E+05	6.59E+04	5.87E+04	7.36E+04
MW-104	29-Aug-95	1.24E+06	1.15E+06	1.34E+06	5.05E+00	1.05E+00	3.82E+00	2.17E+02	1.14E+02	3.86E+02
Marginal Inoculum		na	na	na	na	1.00E+01	1.00E+03	na	1.00E+01	1.00E+03
Inoculum Levels		na	na	na	na	1.00E+03	1.00E+06	na	1.00E+03	1.00E+06
Active Degradation Level		na	na	na	na	1.00E+06	1.00E+09	na	1.00E+06	1.00E+09

Notes: na: Not applicable.  
nr: Analysis not requested.  
C:N: Ratio of Total Organic Carbon (TOC) to Nitrogen.  
C:P: Ratio of Total Organic Carbon (TOC) to Phosphorous.  
: Degradation populations present at levels required for active degradation.  
: Degradation populations present at levels which would require augmentation for active degradation.

**APPENDIX A**

**STANDARD OPERATING PROCEDURES  
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Eff. Date	Initiator	Apprv'd
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**PRACTICE TITLE**

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**07-06 SUBSURFACE EXPLORATION METHODS (Cont'd)**

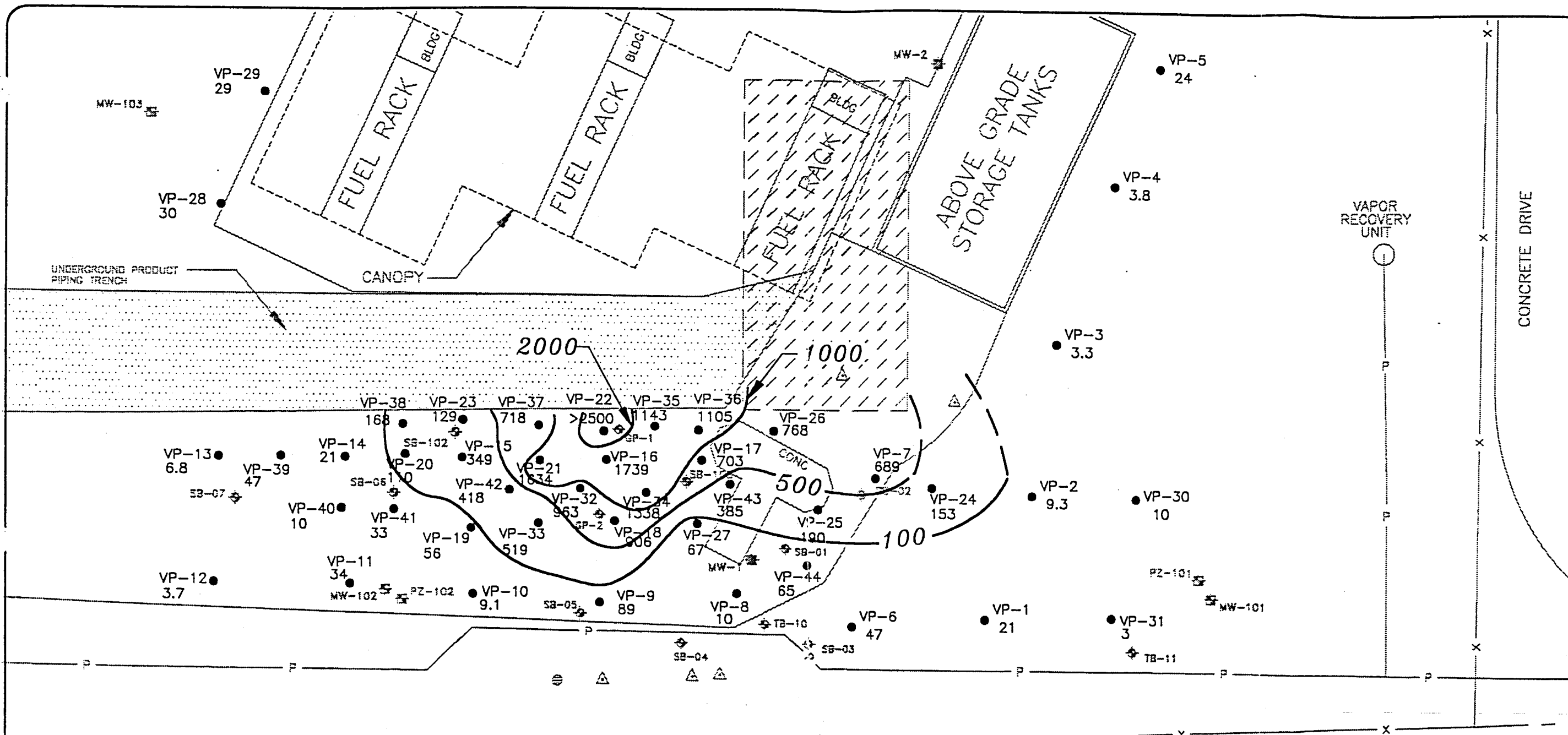
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CHECKED BY:	BSK	DATE:	10/26/95
APPROVED BY:	REM	DATE:	10-26-95
AUTOCAD FILE: 1096-B02			

**SOIL VAPOR PROBE CONCENTRATIONS**  
 CITGO PETROLEUM BULK TERMINAL  
 9235 NORTH 107TH STREET  
 MILWAUKEE, WISCONSIN



**Natural Resource Technology**

PROJECT NO.  
1096/7N

DRAWING NO.  
1096-B02

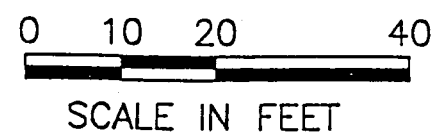
FIGURE NO.  
5

**LEGEND**

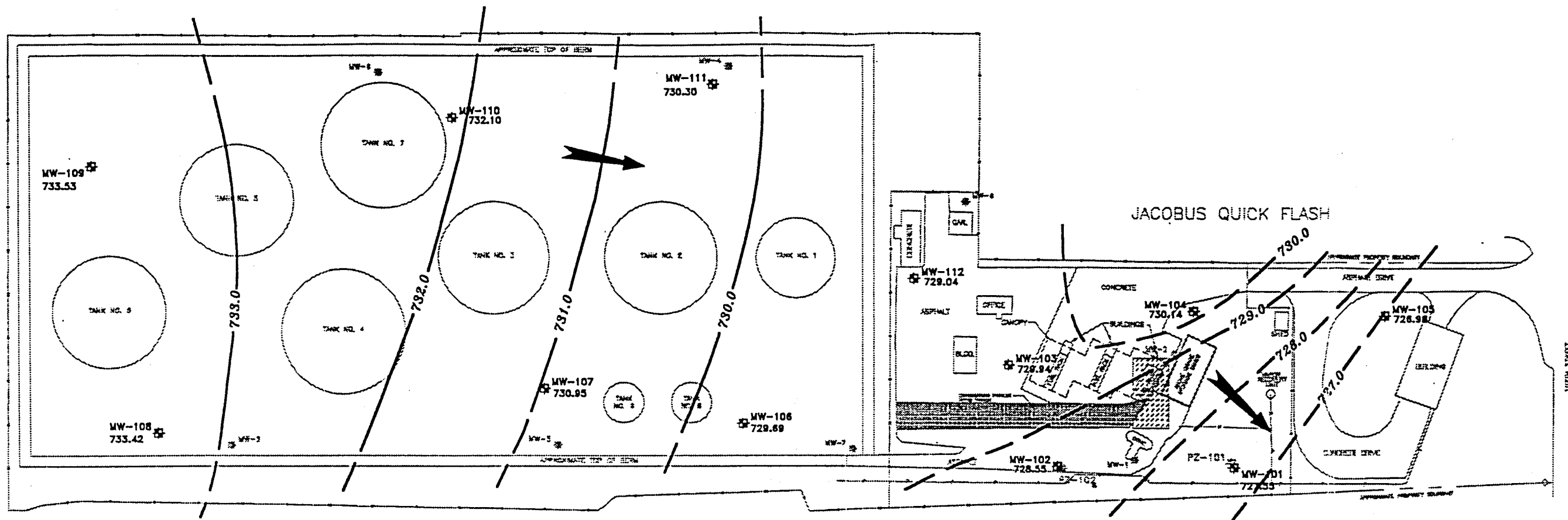
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10 SOIL VAPOR PROBE AND PEAK PID READING (PPM RELATIVE TO ISOBUTYLENE)
- 100 PID CONCENTRATION CONTOURS (PPM RELATIVE TO ISOBUTYLENE)
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- MW-1 ABANDONED MONITORING WELL
- MW-102 MONITORING WELL
- SB-103 SOIL BORING
- 36" RISERS
- STORM INLET
- ABOVE GROUND PIPELINE
- FENCE
- ESTIMATED LOCATION OF USTS REMOVED IN MAY 1991

**NOTE:**

1. LOCATION OF ABANDONED MONITORING WELLS AND SOIL BORINGS SB-01, SB-03, SB-04, SB-05, SB-07 GP-1, GP-2, TB-10, AND TB-11 ARE ESTIMATED.
2. EXISTING MONITORING WELLS, PIEZOMETERS, SB-102, SB-103, GP-1, AND GP-2 WERE COMPLETED BY NRT.
3. ABANDONED MONITORING WELLS AND SOIL BORINGS TB-10 AND TB-11 WERE CONSTRUCTED BY TCT.
4. SOIL BORINGS SB-01 THROUGH SB-07 WERE COMPLETED BY F&VO.



SOURCE NOTE:  
THIS DRAWING HAS BEEN MODIFIED FROM MAP BY WELCH, HANSON, & ASSOCIATES, INC., NASHOTAH, WISCONSIN, PROJECT NO. 10443, DATED OCTOBER 12, 1993.



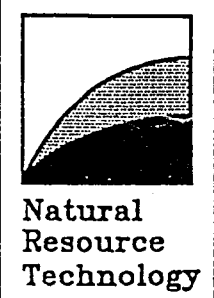
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WISCONSIN, PROJECT NO. 10443, DATED OCTOBER  
12, 1988.

- NOTE:
1. LOCATION OF ABANDONED MONITORING WELLS, ARE ESTIMATED.
  2. MONITORING WELLS MW-101 THRU MW-105 (LAST AREA) ARE SCREENING THE UPPER CLAY UNIT.
  3. MONITORING WELLS MW-108 THRU MW-112 (LAST AREA) ARE SCREENING THE UPPER PORTION OF THE SAND UNIT AND THE CLAY UNIT (IF PRESENT).
  4. EXISTING MONITORING WELLS AND PIEZOMETERS WERE COMPLETED BY NRT.
  5. ABANDONED MONITORING WELLS WERE CONSTRUCTED BY TCT.

- LEGEND
- MW-102  
727.35 WATER TABLE ELEVATION (MSL)
  - 727.0 WATER TABLE ELEVATION CONTOUR (MSL)
  - APPARENT GROUNDWATER FLOW DIRECTION
  - PZ-101  
PIEZOMETER
  - MW-101  
ABANDONED MONITORING WELL
  - BENCH MARK
  - STORM INLET
  - FENCE
  - PIPELINE
  - ESTIMATED LOCATION OF USTs REMOVED IN MAY 1991

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 CHECKED BY: BSK DATE: 10/26/95  
 APPROVED BY: TEM DATE: 10-26-95  
 AUTOCAD FILE: 1096-B03

WATER TABLE ELEVATION CONTOURS  
 OCTOBER 16, 1995  
 CITGO PETROLEUM BULK TERMINAL  
 9235 NORTH 107TH STREET  
 MILWAUKEE, WISCONSIN



PROJECT NO.  
1096/7N  
 DRAWING NO.  
1096-B03  
 FIGURE NO.  
4

**PRACTICE TITLE**

**REFERENCE DOCUMENTS**

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- 07-08-07 Field Procedure for Withdrawal and Injection Well Tests for Determining Hydraulic Properties of Aquifer Systems . . . . . ASTM D4050
- 07-08-08 Analytical Procedure for Determining Transmissivity of Nonleaky Confined Aquifers by Over-damped Well Response to Instantaneous Change in Head (Slug Tests) . . . . . ASTM D4104
- 07-08-09 Analytical Procedure for Determining Transmissivity and Storage Coefficient of Nonleaky Confined Aquifers by the Modified Theis Nonequilibrium Method . . . . . ASTM D4105
- 07-08-10 Analytical Procedure for Determining Transmissivity and Storage Coefficient of Nonleaky Confined Aquifers by the Theis Nonequilibrium Method . . . . . ASTM D4106
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9. Personal Communication, Layne-Northwest Co., Pewaukee, WI
10. Cole-Parmer Model 01481-61 Conductivity Meter Manual
11. Photovac Microtip IS-3000 User's Manual
12. Cole-Parmer Models 5996-50,60,70,80 pH Meter Instruction Manual
13. American Society for Testing and Materials, Proposed Standard Guide, W. Teasdale, February 5, 1994
14. AMS Vapor Probe Instruction Manual
15. Bouwer and Rice, 1976. "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells". Water Resources Research, Vol.12, No.3.
16. U.S.EPA, Laboratory Data Validation-Functional Guidelines for Evaluating Organics Analyses, February 1, 1988.
17. Solinist Water Level Indicator Instruction Manual

Section: Site Investigation  
Number: 07-TC  
Date: 02-18-94  
Revision: 0  
Page: 7 of 7

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Document number: \_\_\_\_\_



**APPENDIX B**

**HYDRAULIC GRADIENT CALCULATIONS**



**APPENDIX C**

**SOIL BORING LOGS AND ABANDONMENT FORMS**

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>Project Name</b> Citgo Bulk Terminal/Site Investigation-1096		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-101	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/18/95	<b>Date Drilling Completed</b> 08/18/95	<b>Drilling Method</b> 4-1/4" (ID) HSA	
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b> SB-101	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> Feet MSL	<b>Borehole Diameter</b> 8 inches
<b>Boring Location</b> State Plane SE 1/4 of Ne 1/4 of Section 6, T8N, R21		<b>Feet N</b>	<b>Feet E</b>	<b>Lat</b>	<b>Long</b>
				<input type="checkbox"/> N	<input type="checkbox"/> E
				<input type="checkbox"/> S	<input type="checkbox"/> W

<b>County</b> Milwaukee		<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee		
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Sample Number and Type	Length Alt. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			2		ASPH										
SB-101 (3.5)	23		4	2.5-4.5' CLAY w/SILT, mottled brown (10YR 5/3) and very dark gray (10YR 3/1), 15% fine subang. GRAVEL, low plasticity, soft, moist, petroleum odor (FILL)	CL (FILL)			820							
SB-101 (8.5)	24		8	7.5-9.5' CLAY, brown (7.5YR 5/3), w/ 5% yellowish brown (10YR 5/6) mottling, tr.-5% SILT, tr. fine subang. GRAVEL, med. plasticity, hard, sl. moist, no odor	CL			110							
			10	EOB @ 9.5'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature:

Firm: Natural Resource Technology

This form is authorized by Chapter 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location <u>SB-101</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
<u>SE 1/4 of NE 1/4 of Sec. 6 : T. 8 N. R. 21</u> (If applicable)		Present Well Owner <u>AS ABOVE</u>	
Gov't Lot	Grid Number	Street or Route <u>2316 TERMINAL DRIVE</u>	
Grid Location ft. <input type="checkbox"/> N. <input type="checkbox"/> S. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>ARLINGTON HEIGHTS IL 60065</u>	
Civil Town Name <u>CITY OF MILWAUKEE</u>		Facility Well No. and/or Name (If Applicable) <u>SB-101</u>	WI Unique Well No. -----
Street Address of Well <u>9235 NORTH 107TH STREET</u>		Reason For Abandonment <u>COMPLETION OF BORING</u>	
City, Village <u>CITY OF MILWAUKEE</u>		Date of Abandonment <u>08/18/95</u>	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) <u>08/18/95</u>		(4) Depth to Water (Feet)	
<input type="checkbox"/> Monitoring Well	Construction Report Available? <input type="checkbox"/> Yes <input type="checkbox"/> No <u>NA</u>	Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
<input type="checkbox"/> Water Well		Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
<input type="checkbox"/> Drillhole		Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable	
Borehole		Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug		If No. Explain <u>ALL DRILL CASING REMOVED</u>	
<input type="checkbox"/> Other (Specify) _____		Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
Formation Type: Unconsolidated Formation <input type="checkbox"/> Bedrock		Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Total Well Depth (ft.) <u>9.5</u> Casing Diameter (ins.) <u>NA</u>		Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
(From ground surface)		If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Casing Depth (ft.) <u>NA</u>		(5) Required Method of Placing Sealing Material	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown	Feet	<input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped	
If Yes, To What Depth? _____		<input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain)	
		(6) Sealing Materials	
		For monitoring wells and monitoring well boreholes only	
		<input type="checkbox"/> Neat Cement Grout	
		<input type="checkbox"/> Sand-Cement (Concrete) Grout	
		<input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets	
		<input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Granular Bentonite	
		<input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite - Cement Grout	
		<input checked="" type="checkbox"/> Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>9.5</u>		

(8) Comments:

(9) Name of Person or Firm Doing Sealing Work  
Midwest Engineering Services

Signature of Person Doing Work <u>[Signature]</u>	Date Signed
Street or Route	Telephone Number ( )
City, State, Zip Code	

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Renewer/Inspector	
Follow-up Necessary	

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

City/Project Name <i>Citgo Bulk Terminal/Site Investigation (1096)</i>			License/Permit/Monitoring Number		Boring Number <i>SB-102</i>
Boring Drilled By (Firm name and name of crew chief) <i>Midwest Engineering Services</i>			Date Drilling Started <i>08/18/95</i>	Date Drilling Completed <i>08/18/95</i>	Drilling Method <i>4-1/4" (ID) HSA</i>
DNR Facility Well No.	WI Unique Well No.	Common Well Name	Final Static Water Level <i>Feet MSL</i>	Surface Elevation <i>732.35 Feet MSL</i>	Borehole Diameter <i>8 inches</i>
Boring Location State Plane <i>SE 1/4 of Ne 1/4 of Section 6, T8N, R21</i>		Feet N Feet E	Lat Long	Local Grid Location (if applicable) <i>1852.3 feet</i> <input checked="" type="checkbox"/> N <i>1882.9 feet</i> <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

County <i>Milwaukee</i>	DNR County Code <i>41</i>	Civil Town/City/ or Village <i>City of Milwaukee</i>
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Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0-2	ASPHALT AND GRAVEL SUBGRADE	ASPH GP									
SBI02 (3.5)	23		2-4	2.5'-4.5' CLAY W/ SILT, mottled brown (10YR 5/3) & v. dk. gray (10YR 3/1), 15% f. subang. gravel, low plast., soft, moist, petroleum odor (FILL)	CL (FILL)			820						
MW102 (8.5)	24		4-8	7.5'-9.5' CLAY, brown (7.5YR 5/3), 5% yellowish brown (10YR 5/6) mottling, trc-5% silt, trc f. subang gravel, med plast., hard, sl. moist, no odor	CL									
			8-10	EOB @ 9.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *Terrence J. O'Connell* Firm: **Natural Resource Technology**

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location <u>SB-102</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
SE 1/4 of NE 1/4 of Sec. <u>6</u> : T. <u>8</u> N. R. <u>21</u> (If applicable)		Present Well Owner <u>AS ABOVE</u>	
Gov't Lot	Grid Number	Street or Route <u>2316 TERMINAL DRIVE</u>	
Grid Location	ft. <input type="checkbox"/> N. <input type="checkbox"/> S. ft. <input type="checkbox"/> E. <input type="checkbox"/> W.	City, State, Zip Code <u>ARLINGTON HEIGHTS IL 60065</u>	
Civil Town Name <u>CITY OF MILWAUKEE</u>		Facility Well No. and/or Name (If Applicable) <u>SB-102</u>	WI Unique Well No. -----
Street Address of Well <u>9235 NORTH 107TH STREET</u>		Reason For Abandonment <u>COMPLETION OF BORING</u>	
City, Village <u>CITY OF MILWAUKEE</u>		Date of Abandonment <u>08/18/95</u>	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On  
(Date) 08/18/95

Monitoring Well  
 Water Well  
 Drillhole  
 Borehole

Construction Report Available?  
 Yes  No NA

Construction Type:  
 Drilled  Driven (Sandpoint)  Dug  
 Other (Specify) \_\_\_\_\_

Formation Type:  
Unconsolidated Formation  Bedrock

Total Well Depth (ft.) 9.5 Casing Diameter (ins.) NA  
(From ground surface)

Casing Depth (ft.) NA

Was Well Annular Space Grouted?  Yes  No  Unknown  
If Yes, To What Depth? \_\_\_\_\_ Feet

(4) Depth to Water (Feet)

Pump & Piping Removed?  Yes  No  Not Applicable  
Liner(s) Removed?  Yes  No  Not Applicable  
Screen Removed?  Yes  No  Not Applicable  
Casing Left in Place?  Yes  No  
If No, Explain ALL DRILL CASING REMOVED

Was Casing Cut Off Below Surface?  Yes  No  
Did Sealing Material Rise to Surface?  Yes  No  
Did Material Settle After 24 Hours?  Yes  No  
If Yes, Was Hole Retopped?  Yes  No

(5) Required Method of Placing Sealing Material

Conductor Pipe-Gravity  Conductor Pipe-Pumped  
 Dump Bailer  Other (Explain) \_\_\_\_\_

(6) Sealing Materials

Neat Cement Grout  
 Sand-Cement (Concrete) Grout  
 Concrete  
 Clay-Sand Slurry  
 Bentonite-Sand Slurry  
 Chipped Bentonite

For monitoring wells and monitoring well boreholes only:  
 Bentonite Pellets  
 Granular Bentonite  
 Bentonite - Cement Grout

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>9.5</u>		

(8) Comments: \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work  
MIDWEST ENGINEERING SERVICES

Signature of Person Doing Work [Signature] Date Signed \_\_\_\_\_  
Street or Route \_\_\_\_\_ Telephone Number ( ) \_\_\_\_\_  
City, State, Zip Code \_\_\_\_\_

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected \_\_\_\_\_ District/County \_\_\_\_\_  
Renewal/Inspector \_\_\_\_\_  
Follow-up Necessary \_\_\_\_\_

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-103
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services			<b>Date Drilling Started</b> 08/18/95	<b>Date Drilling Completed</b> 08/18/95	<b>Drilling Method</b> 4-1/4" (ID) HSA
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b>	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> 732.37 Feet MSL	<b>Borehole Diameter</b> 8 inches
<b>Boring Location</b> State Plane SE 1/4 of Ne 1/4 of Section 6, T8N, R21		<b>Feet N</b> <b>Feet E</b>	<b>Lat</b> <b>Long</b>	<b>Local Grid Location (if applicable)</b> 1843.0 feet <input checked="" type="checkbox"/> N 1926.2 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

<b>County</b> Milwaukee	<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee
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Sample Number and Type	Length Alt. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0	ASPHALT & GRAVEL SUBGRADE	ASPH GP									
SB-103 (3.5)	17		2-4	2.5'-4.5' CLAY W/GRAVEL brown (10YR 5/3), 5% black mottling, med subang gravel, 10% silt, low plast., soft, v. moist, sl. petroleum odor (FILL)	CL (FILL)			510						
SB-103 (8.5)	24		8-10	7.5'-9.5' CLAY, brown (7.5YR 5/3), 5% silt, med. plast., trc med- crs sand, hard, sl. moist, no odor	CL			61						
			10	EOB @ 9.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Firm: Natural Resource Technology

This form is authorized by Chapters 44.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <b>SB-103</b>	County <b>MILWAUKEE</b>	Original Well Owner (If Known) <b>CITGO PETROLEUM CORPORATION</b>	
SE 1/4 of NE 1/4 of Sec. <b>6</b> ; T. <b>8</b> N. R. <b>21</b> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If applicable)		Present Well Owner <b>AS ABOVE</b>	
Gov't Lot _____ Grid Number _____		Street or Route <b>2316 TERMINAL DRIVE</b>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <b>ARLINGTON HEIGHTS IL 60065</b>	
Civil Town Name <b>CITY OF MILWAUKEE</b>		Facility Well No. and/or Name (If Applicable) <b>SB-103</b>	WI Unique Well No. -----
Street Address of Well <b>9235 NORTH 107<sup>TH</sup> STREET</b>		Reason For Abandonment <b>COMPLETION OF BORING</b>	
City, Village <b>CITY OF MILWAUKEE</b>		Date of Abandonment <b>08/18/95</b>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

**(3) Original Well/Drillhole/Borehole Construction Completed On**  
(Date) **08/18/95**

Monitoring Well  
 Water Well  
 Drillhole  
 Borehole

Construction Report Available?  
 Yes  No  NA

Construction Type:  
 Drilled  Driven (Sandpoint)  Dug  
 Other (Specify) \_\_\_\_\_

Formation Type:  
Unconsolidated Formation  Bedrock

Total Well Depth (ft.) **9.5** Casing Diameter (ins.) **NA**  
(From ground surface)

Casing Depth (ft.) **NA**

Was Well Annular Space Grouted?  Yes  No  Unknown  
If Yes, To What Depth? \_\_\_\_\_ Feet

**(4) Depth to Water (Feet)** \_\_\_\_\_

Pump & Piping Removed?  Yes  No  Not Applicable  
 Lines(s) Removed?  Yes  No  Not Applicable  
 Screen Removed?  Yes  No  Not Applicable  
 Casing Left in Place?  Yes  No  
 If No, Explain **ALL DRILL CASING REMOVED**

Was Casing Cut Off Below Surface?  Yes  No  
 Did Sealing Material Rise to Surface?  Yes  No  
 Did Material Settle After 24 Hours?  Yes  No  
 If Yes, Was Hole Retopped?  Yes  No

**(5) Required Method of Placing Sealing Material**

Conductor Pipe-Gravity  Conductor Pipe-Pumped  
 Dump Bailer  Other (Explain) \_\_\_\_\_

**(6) Sealing Materials** For monitoring wells and monitoring well boreholes only

Neat Cement Grout  
 Sand-Cement (Concrete) Grout  
 Concrete  Bentonite Pellets  
 Clay-Sand Slurry  Granular Bentonite  
 Bentonite-Sand Slurry  Bentonite - Cement Grout  
 Chipped Bentonite

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<b>3/8" CHIPPED BENTONITE</b>	Surface	<b>9.5</b>		

**(8) Comments:** \_\_\_\_\_

**(9) Name of Person or Firm Doing Sealing Work**  
**MAWEST ENGINEERING SERVICES**

Signature of Person Doing Work: *[Signature]* Date Signed: \_\_\_\_\_  
 Street or Route: \_\_\_\_\_ Telephone Number: ( ) \_\_\_\_\_  
 City, State, Zip Code: \_\_\_\_\_

**(10) FOR DNR OR COUNTY USE ONLY**

Date Received/Inspected: \_\_\_\_\_ District/County: \_\_\_\_\_  
 Renewer/Inspector: \_\_\_\_\_  
 Follow-up Necessary: \_\_\_\_\_

<b>City/Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-104 (log for MW-102 & PZ-102)	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/17/95		<b>Date Drilling Completed</b> 08/17/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b>	
<b>Final Static Water Level</b> Feet MSL		<b>Surface Elevation</b> 731.6 Feet MSL		<b>Borehole Diameter</b> 8 inches	
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R 21		<b>Feet N</b>  <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 1824 feet <input checked="" type="checkbox"/> N 1871 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

<b>County</b> Milwaukee	<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee
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Sample Number and Type	Length Att. & Recovered (ft)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0	ASPHALT & GRAVEL SUBGRADE	ASPH GP									
SB-104 (3)	22	18	2	2'-4' CLAY, yellowish brown (10YR 5/4), 10% dark yellowish brown (10YR 4/6) mottling, trc black mottling, 5-10% f. subang gravel, med. plast., firm, moist-v. moist, no odor, (FILL)	CL (FILL)			112						water @ 4'
SB-104 (8)	21	17	8	7'-9' CLAY, brown (10YR 4/3), littl silt, trc f. subang gravel, med plast., firm, moist, no odor	CL			81						
SB-104 (13)	23	52	12	12'-14' SAND, lt brownish gray (2.5Y 6/2), prly graded, littl silt, f., subrnd-rnd, soft, wet	SP			34						
			14	FOB @ 14'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *Rebecca J. DePue*

Firm: Natural Resource Technology

This form is authorized by Chapter 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <b>SB-104</b>	County <b>MILWAUKEE</b>	Original Well Owner (If Known) <b>CITGO PETROLEUM CORPORATION</b>	
SE 1/4 of NE 1/4 of Sec. <b>6</b> ; T. <b>8</b> N; R. <b>Z1</b> <input checked="" type="checkbox"/> E <input type="checkbox"/> W		Present Well Owner <b>AS ABOVE</b>	
(If applicable) Gov't Lot _____ Grid Number _____		Street or Route <b>2316 TERMINAL DRIVE</b>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <b>ARLINGTON HEIGHTS IL 60065</b>	
Civil Town Name <b>CITY OF MILWAUKEE</b>		Factory Well No. and/or Name (If Applicable) <b>SB-104</b>	WI Unique Well No. _____
Street Address of Well <b>9235 NORTH 107<sup>TH</sup> STREET</b>		Reason For Abandonment <b>COMPLETION OF BORING</b>	
City, Village <b>CITY OF MILWAUKEE</b>		Date of Abandonment <b>08/17/95</b>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

(3) Original Well/Drillhole/Borehole Construction Completed On  
(Date) **08/17/95**

Monitoring Well      Construction Report Available?  
 Water Well               Yes  No **NA**  
 Drillhole  
 Borehole

Construction Type:  
 Drilled       Driven (Sandpoint)       Dug  
 Other (Specify) \_\_\_\_\_

Formation Type:  
 Unconsolidated Formation       Bedrock

Total Well Depth (ft.) **14**      Casing Diameter (ins.) **NA**  
(From ground surface)

Casing Depth (ft.) **NA**

Was Well Annular Space Grouted?       Yes  No  Unknown  
If Yes, To What Depth? \_\_\_\_\_ Feet

(4) Depth to Water (Feet) **79**

Pump & Piping Removed?       Yes  No  Not Applicable  
Liner(s) Removed?               Yes  No  Not Applicable  
Screen Removed?                 Yes  No  Not Applicable  
Casing Left in Place?           Yes  No  
If No, Explain **ALL DRILL CASING REMOVED**

Was Casing Cut Off Below Surface?       Yes  No  
Did Sealing Material Rise to Surface?       Yes  No  
Did Material Settle After 24 Hours?       Yes  No  
If Yes, Was Hole Retopped?               Yes  No

(5) Required Method of Placing Sealing Material

Conductor Pipe-Gravity       Conductor Pipe-Pumped  
 Dump Bailer                       Other (Explain) \_\_\_\_\_

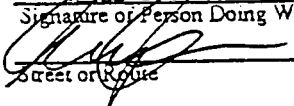
(6) Sealing Materials      For monitoring wells and monitoring well boreholes only

Neat Cement Grout  
 Sand-Cement (Concrete) Grout  
 Concrete                               Bentonite Pellets  
 Clay-Sand Slurry                       Granular Bentonite  
 Bentonite-Sand Slurry                       Bentonite - Cement Grout  
 Chipped Bentonite

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<b>3/8" CHIPPED BENTONITE</b>	Surface	<b>14</b>		

(8) Comments: \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work  
**MAJEST ENGINEERING SERVICES**

Signature of Person Doing Work 	Date Signed
Street or Route	Telephone Number ( )
City, State, Zip Code	

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

<b>Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-105 (log for MW-103)	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services			<b>Date Drilling Started</b> 08/17/95		<b>Date Drilling Completed</b> 08/17/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>	<b>Common Well Name</b>		<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> 732.8 Feet MSL
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R 21		<b>Feet N</b> <b>Feet E</b>		<b>Lat</b> <b>Long</b>		<b>Local Grid Location (if applicable)</b> 1913 feet <input checked="" type="checkbox"/> N <input type="checkbox"/> S 1827 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> W

<b>County</b> Milwaukee		<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee			
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Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0	ASPHALT W/ GRAVEL SUBGRADE (FILL)	ASPH										
SB-105 (3)	49	15	2	2'-4' CLAY W/ SILT, pale brown (10YR 6/3) & yellowish brown (10YR 5/6), low-med plast., firm, trc f. gravel, moist, no odor (FILL)	CL (FILL)			94							
SB-105 (8)	23	10	8	7'-9' CLAY, brown (10YR 5/3) few vt. lamin. silt - dark yellowish brown (10YR 4/6) & greenish gray (10Y 6/1), trc f-med subang gravel, med-high plast., hard, moist, no odor	CL			61							
SB-105 (13)	18	34	12	12'-14' SAND, light brownish gray (2.5Y 6/2), prly graded, 5% silt, f., subrnd, compact, wet, no odor	SP			97							
			14	EOB @ 14'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Terrence J. Peper* Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location <u>SB-105</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
SE 1/4 of NE 1/4 of Sec. <u>6</u> : T. <u>8</u> N. R. <u>21</u> (If applicable)		Present Well Owner <u>AS ABOVE</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>2316 TERMINAL DRIVE</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>ARLINGTON HEIGHTS IL 60065</u>	
Civil Town Name <u>CITY OF MILWAUKEE</u>		Facility Well No. and/or Name (If Applicable) <u>SB-105</u>	WI Unique Well No. _____
Street Address of Well <u>9235 NORTH 107<sup>TH</sup> STREET</u>		Reason For Abandonment <u>COMPLETION OF BORING</u>	
City, Village <u>CITY OF MILWAUKEE</u>		Date of Abandonment <u>08/17/95</u>	

WELL/DRILLHOLE/BOREHOLE INFORMATION

(3) Original Well/Drillhole/Borehole Construction Completed On (Date) <u>08/17/95</u>		(4) Depth to Water (Feet) <u>79'</u>	
<input type="checkbox"/> Monitoring Well	Construction Report Available? <input type="checkbox"/> Yes <input type="checkbox"/> No <u>NA</u>	Pump & Piping Removed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable
<input type="checkbox"/> Water Well		Liner(s) Removed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable
<input type="checkbox"/> Drillhole		Screen Removed?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable
<input type="checkbox"/> Borehole		Casing Left in Place?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		If No, Explain <u>ALL DRILL CASING REMOVED</u>	
Formation Type: Unconsolidated Formation <input type="checkbox"/> Bedrock <input type="checkbox"/>		Was Casing Cut Off Below Surface?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Total Well Depth (ft.) <u>14</u> Casing Diameter (ins.) <u>NA</u> (From ground surface)		Did Sealing Material Rise to Surface?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Casing Depth (ft.) <u>NA</u>		Did Material Settle After 24 Hours?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		If Yes, Was Hole Retopped?	<input type="checkbox"/> Yes <input type="checkbox"/> No
		(5) Required Method of Placing Sealing Material	<input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Durno Bailer <input type="checkbox"/> Other (Explain) _____
		(6) Sealing Materials	For monitoring wells and monitoring well boreholes only
		<input type="checkbox"/> Near Cement Grout	<input type="checkbox"/> Bentonite Pellets
		<input type="checkbox"/> Sand-Cement (Concrete) Grout	<input type="checkbox"/> Granular Bentonite
		<input type="checkbox"/> Concrete	<input type="checkbox"/> Bentonite - Cement Grout
		<input type="checkbox"/> Clay-Sand Slurry	
		<input type="checkbox"/> Bentonite-Sand Slurry	
		<input checked="" type="checkbox"/> Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	Surface	<u>14</u>		

(8) Comments:

(9) Name of Person or Firm Doing Sealing Work <u>MIDWEST ENGINEERING SERVICES</u>	
Signature of Person Doing Work 	Date Signed
Street or Route	Telephone Number ( )
City, State, Zip Code	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

Route To:  
 Solid Waste  
 Emergency Response  
 Wastewater  
 Superfund  
 Haz. Waste  
 Underground Tanks  
 Water Resources  
 Other:

<b>y/Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> SB-106 (log for MH-111)
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services			<b>Date Drilling Started</b> 08/24/95	<b>Date Drilling Completed</b> 08/24/95	<b>Drilling Method</b> 4-1/4" (ID) HSA
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b>	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> 732.69 Feet MSL	<b>Borehole Diameter</b> 8 inches
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R21		<b>Feet N</b>  <b>Feet E</b>	<b>Lat</b>  <b>Long</b>	<b>Local Grid Location (if applicable)</b> 1860.1 feet <input checked="" type="checkbox"/> N 1589.5 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	

<b>County</b> Milwaukee	<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee
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Sample Number and Type	Length Att. & Recovered (ft)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2	GRAVEL, crs., ang., (FILL)	GP (FILL)									
SB-106 (3.5)	13	10	4	CLAY W/ GRAVEL, brown (10YR 5/3) med. plast., f.-crs. subang grave l, soft, sl. moist, no odor (FILL)	CL (FILL)									
SB-106 (8.5)	8	32	8	7.5'-9.5' SILTY SAND, lt yellowish brown (2.5Y 6/3), prly graded, f., subrnd, trc clay, soft, wet, no odor	SM									
SB-106 (13.5)	19	25	14	5% clay, light olive brown (2.5Y 5/3)										
			16	EOB @ 14.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature:

Firm: Natural Resource Technology

This form is authorized by Chapters 14.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>SB-106</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
(If applicable) <u>SE</u> 1/4 of <u>NE</u> 1/4 of Sec. <u>6</u> ; T. <u>8</u> N. R. <u>Z1</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W Gov't Lot _____ Grid Number _____		Present Well Owner <u>AS ABOVE</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		Street or Route <u>2316 TERMINAL DRIVE</u>	
Civil Town Name <u>CITY OF MILWAUKEE</u>		City, State, Zip Code <u>ARLINGTON HEIGHTS IL 60065</u>	
Street Address of Well <u>9235 NORTH 107TH STREET</u>		Facility Well No. and/or Name (If Applicable) <u>SB-106</u>	
City, Village <u>CITY OF MILWAUKEE</u>		Reason For Abandonment <u>COMPLETION OF BORING</u>	
		Date of Abandonment <u>08/24/95</u>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

**(3) Original Well/Drillhole/Borehole Construction Completed On**  
(Date) 08/24/95

Monitoring Well  
 Water Well  
 Drillhole  
 Borehole

Construction Report Available?  
 Yes  No NA

Construction Type:  
 Drilled  Driven (Sandpoint)  Dug  
 Other (Specify) \_\_\_\_\_

Formation Type:  
 Unconsolidated Formation  Bedrock

Total Well Depth (ft.) 14.5 Casing Diameter (ins.) NA  
(From ground surface)

Casing Depth (ft.) NA

Was Well Annular Space Grouted?  Yes  No  Unknown  
If Yes, To What Depth? \_\_\_\_\_ Feet

**(4) Depth to Water (Feet)** < 7.5

Pump & Piping Removed?  Yes  No  Not Applicable  
 Liner(s) Removed?  Yes  No  Not Applicable  
 Screen Removed?  Yes  No  Not Applicable  
 Casing Left in Place?  Yes  No  
 If No, Explain ALL DRILL CASING REMOVED

Was Casing Cut Off Below Surface?  Yes  No  
 Did Sealing Material Rise to Surface?  Yes  No  
 Did Material Settle After 24 Hours?  Yes  No  
 If Yes, Was Hole Retopped?  Yes  No

**(5) Required Method of Placing Sealing Material**

Conductor Pipe-Gravity  Conductor Pipe-Pumped  
 Dump Bailer  Other (Explain) \_\_\_\_\_

**(6) Sealing Materials** For monitoring wells and monitoring well boreholes only

Neat Cement Grout  
 Sand-Cement (Concrete) Grout  
 Concrete  
 Clay-Sand Slurry  
 Bentonite-Sand Slurry  
 Chipped Bentonite

Bentonite Pellets  
 Granular Bentonite  
 Bentonite - Cement Grout

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>14.5</u>		

(8) Comments:

**(9) Name of Person or Firm Doing Sealing Work**  
MODEST ENGINEERING SERVICES

Signature of Person Doing Work \_\_\_\_\_ Date Signed \_\_\_\_\_

Street or Route \_\_\_\_\_ Telephone Number ( ) \_\_\_\_\_

City, State, Zip Code \_\_\_\_\_

**(10) FOR DNR OR COUNTY USE ONLY**

Date Received/Inspected \_\_\_\_\_ District/County \_\_\_\_\_

Renewal/Inspector \_\_\_\_\_

Follow-up Necessary \_\_\_\_\_

<b>City/Project Name</b> Litgo Bulk Terminal / Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> GP-1	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Briohn Environmental Contractors Terry McGovern		<b>Date Drilling Started</b> 06/07/95	<b>Date Drilling Completed</b> 06/07/95	<b>Drilling Method</b> GeoProbe	
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b>	<b>Final Static Water Level</b> Feet MSL	<b>Surface Elevation</b> 732.4 Feet MSL	<b>Borehole Diameter</b> 2 inches
<b>Boring Location</b> State Plane NE 1/4, NE 1/4, Section 6, T8N, R21E		<b>Feet N</b>  <b>Feet E</b>	<b>Lat</b>  <b>Long</b>	<b>Local Grid Location (if applicable)</b> 1854 feet <input checked="" type="checkbox"/> N 1905 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b>	<b>Civil Town/City/ or Village</b> City of Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0'-0.5'	ASPHALT		Asphalt									
				Gravel and sand base fill		GP									
GP-1 (2)	22		2	1'-11': CLAY w/ silt, brown (10YR 5/3), 10% light grey (10YR 7/1) mottling, medium plasticity, firm, moist, odor.				430							
GP-1 (4)	18		4	trace of mottling, trace fine sand, slightly moist, hard, strong odor.				680							
	23		6	occasional light brown (7.5YR 6/3) silt laminations, 15% mottling, slightly moist.	CL			310							
GP-1 (8)	20		8	color grayish brown (10YR 5/2), moist, firm.				100							
GP-1 (10)	23		10	very moist to wet lower 2"				61							
			12	END OF PROBE @ 11 FEET											
			14												
			16												
			18												
			20												
			22												

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *Rebecca J. O'Connell* Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>GP-1</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
SE 1/4 of NE 1/4 of Sec. <u>6</u> : T. <u>8</u> N. R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If applicable)		Present Well Owner <u>AS ABOVE</u>	
Gov't Lot _____	Grid Number _____	Street or Route <u>2316 TERMINAL DRIVE</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>ARLINGTON HEIGHTS IL 60065</u>	
Civil Town Name <u>CITY OF MILWAUKEE</u>		Factory Well No. and/or Name (If Applicable) <u>GP-1</u>	WI Unique Well No. _____
Street Address of Well <u>9235 NORTH 107TH STREET</u>		Reason For Abandonment <u>COMPLETION OF BORING</u>	
City, Village <u>CITY OF MILWAUKEE</u>		Date of Abandonment <u>06/07/95</u>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

(3) Original Well/Drillhole/Borehole Construction Completed On  
(Date) 06/07/95

Monitoring Well  
 Water Well  
 Drillhole  
 Borehole

Construction Report Available?  
 Yes  No NA

Construction Type:  
 Drilled  Driven (Sandpoint)  Dug  
 Other (Specify) \_\_\_\_\_

Formation Type:  
 Unconsolidated Formation  Bedrock

Total Well Depth (ft.) 11 Casing Diameter (ins.) NA  
(From ground surface)

Casing Depth (ft.) NA

Was Well Annular Space Grouted?  Yes  No  Unknown  
If Yes, To What Depth? \_\_\_\_\_ Feet

(4) Depth to Water (Feet) \_\_\_\_\_

Pump & Piping Removed?  Yes  No  Not Applicable  
Line(s) Removed?  Yes  No  Not Applicable  
Screen Removed?  Yes  No  Not Applicable  
Casing Left in Place?  Yes  No  
If No, Explain ALL DRILL CASING REMOVED

Was Casing Cut Off Below Surface?  Yes  No  
Did Sealing Material Rise to Surface?  Yes  No  
Did Material Settle After 24 Hours?  Yes  No  
If Yes, Was Hole Retopped?  Yes  No

(5) Required Method of Placing Sealing Material

Conductor Pipe-Gravity  Conductor Pipe-Pumped  
 Dump Bailer  Other (Explain) \_\_\_\_\_

(6) Sealing Materials

<input type="checkbox"/> Neat Cement Grout	For monitoring wells and monitoring well boreholes only
<input type="checkbox"/> Sand-Cement (Concrete) Grout	
<input type="checkbox"/> Concrete	
<input type="checkbox"/> Clay-Sand Slurry	
<input type="checkbox"/> Bentonite-Sand Slurry	
<input checked="" type="checkbox"/> Chipped Bentonite	

Bentonite Pellets  
 Granular Bentonite  
 Bentonite - Cement Grout

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>11</u>		

(8) Comments: \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work  
MIDWEST ENGINEERING SERVICES

Signature of Person Doing Work <u>[Signature]</u>	Date Signed
Street or Route	Telephone Number ( )
City, State, Zip Code	

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected	District/County
Renewer/Inspector	
Follow-up Necessary	

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>____y/Project Name</b> <i>Jacobus/Citgo / Site Investigation</i>			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> <i>GP-2</i>
<b>Boring Drilled By</b> (Firm name and name of crew chief) <i>Briohn Environmental Contractors Terry McGovern</i>			<b>Date Drilling Started</b> <i>06/07/95</i>	<b>Date Drilling Completed</b> <i>06/07/95</i>	<b>Drilling Method</b> <i>GeoProbe</i>
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b>	<b>Final Static Water Level</b> <i>Feet MSL</i>	<b>Surface Elevation</b> <i>732.4 Feet MSL</i>	<b>Borehole Diameter</b> <i>2 inches</i>
<b>Boring Location</b> <b>State Plane</b> <i>NE 1/4, NE 1/4, Section 6, T8N, R21E</i>			<b>Feet N</b> <b>Feet E</b>	<b>Lat</b> <b>Long</b>	<b>Local Grid Location (if applicable)</b> <i>1835 feet <input checked="" type="checkbox"/> N 1904 feet <input checked="" type="checkbox"/> E</i> <input type="checkbox"/> S <input type="checkbox"/> W
<b>County</b> <i>Milwaukee</i>		<b>DNR County Code</b>	<b>Civil Town/City/ or Village</b> <i>City of Milwaukee</i>		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RGD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0'-0.5'	ASPHALT	Asphalt									
				Gravel base fill	GP									
GP-2 (2)	17		2	1'-11": CLAY w/ silt, brown (10YR 5/3), 10% light grey (10YR 7/1) mottling, medium plasticity, firm, moist, odor.				120						
GP-2 (4)	18		4	5% mottling, slightly moist, hard, strong odor.				230						
	22		6	few light brown (7.5YR 6/3) silt laminations, trace fine sand, 20% mottling, slightly moist.	CL			185						
GP-2 (8)	23		8	color grayish brown (10YR 5/2), no sand, moist, firm, odor.				68						
GP-2 (10)	24		10	very moist to wet at tip of sample, slight odor.				55						
			12	END OF PROBE @ 11 FEET										
			14											
			16											
			18											
			20											
			22											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *Rebecca J. Boyle* Firm: **Natural Resource Technology**

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

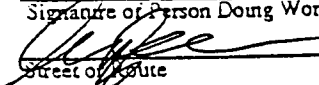
All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

(1) GENERAL INFORMATION		(2) FACILITY NAME	
Well/Drillhole/Borehole Location <u>GP-2</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
(If applicable) <u>SE 1/4 of NE 1/4 of Sec. 6 ; T. 8 N.; R. 21 E.</u>		Present Well Owner <u>AS ABOVE</u>	
Gov't Lot	Grid Number	Street or Route <u>2316 TERMINAL DRIVE</u>	
Grid Location ft. <input type="checkbox"/> N. <input type="checkbox"/> S. ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>ARLINGTON HEIGHTS IL 60065</u>	
Civil Town Name <u>CITY OF MILWAUKEE</u>		Factory Well No. and/or Name (If Applicable) <u>GP-2</u>	WI Unique Well No. _____
Street Address of Well <u>9235 NORTH 107<sup>TH</sup> STREET</u>		Reason For Abandonment <u>COMPLETION OF BORING</u>	
City, Village <u>CITY OF MILWAUKEE</u>		Date of Abandonment <u>06/07/95</u>	

WELL/DRILLHOLE/BOREHOLE INFORMATION		(4) Depth to Water (Feet) <u>~11</u>	
(3) Original Well/Drillhole/Borehole Construction Completed On (Date) <u>06/07/95</u>		<input type="checkbox"/> Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Line(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Screen Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Casing Left in Place? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If No, Explain <u>ALL DRILL CASING REMOVED</u>	
<input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole Borehole  Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____	Construction Report Available? <input type="checkbox"/> Yes <input type="checkbox"/> No <u>NA</u>	Was Casing Cut Off Below Surface? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Formation Type: <input type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock  Total Well Depth (ft.) <u>11</u> Casing Diameter (ins.) <u>NA</u> (From ground surface)  Casing Depth (ft.) <u>NA</u>  Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet	(5) Required Method of Placing Sealing Material <input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dumbo Bailer <input type="checkbox"/> Other (Explain) _____		
		(6) Sealing Materials For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Granular Bentonite <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite - Cement Grout <input type="checkbox"/> Clay-Sand Slurry <input checked="" type="checkbox"/> Chipped Bentonite <input type="checkbox"/> Bentonite-Sand Slurry	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>11</u>		

(8) Comments: \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work <u>MIDWEST ENGINEERING SERVICES</u>		(10) FOR DNR OR COUNTY USE ONLY	
Signature of Person Doing Work 	Date Signed	Date Received/Inspected	District/County
Street of Route	Telephone Number ( )	Renewal/Inspector	
City, State, Zip Code		Follow-up Necessary	

**APPENDIX D**  
**SOIL SAMPLE ANALYTICAL REPORTS**



...chemistry for the environment

1795 Industrial Drive  
Green Bay, WI 54302  
414-469-2436  
800-7-ENCHEM  
FAX: 414-469-8827

Lab Certification No. 405132750  
Location : JACOBUS/CITGO GRAINVILLE TERM.  
En Chem Proj# : 9506159  
Date Reported : 06/19/1995

Report to: NATURAL RESOURCE TECHNOLOGY, INC

Thank you for using En Chem! Samples were analyzed according to strict EPA or Wisconsin DNR methodology. Any comments or problems associated with the receipt of or analysis are reported below:

Sample no. 144887: Front peaks outside of DRO window, indicating lighter fuels are present.

PVOC soil spike exhibited low percent recoveries on individual compounds except the trimethylbenzenes.

Chromatogram has a typical gasoline pattern. Some peaks were outside of GRO window. Blank spike and Blank spike duplicate were within laboratory limits in the same extraction set. Soil spike results are within acceptable criteria, however low recoveries were observed for individual compounds. This is due to the spiking procedure which requires spiked samples to remain unpreserved for twenty-four hours before adding methanol.

**MASTER FILE COPY**

PROJECT # 1096

CO: DATA





...chemistry

1795 Industrial Drive  
 Green Bay, WI 54302  
 414-469-2436  
 800-7-ENCHEM  
 FAX: 414-469-8827

Lab Certification No. 405132750  
 Location : JACOBUS/CITGO GRAINVILLE TERM.  
 Your Sample ID: SB-01(4) (GP-1)  
 Sample Desc. : PROBE 1/DEPTH 3-5  
 Sample Matrix : SOIL Date Collected: 06/07/1995  
 En Chem Proj# : 9506159 Date Received : 06/09/1995  
 En Chem Lab # : 144887 Date Reported : 06/19/1995

TEX 1900

Report to: NATURAL RESOURCE TECHNOLOGY, INC  
 21005 WATERTOWN ROAD #623  
 BROOKFIELD, WI 53008-0623

Bill to: NATURAL RESOURCE TECHNOLOGY, INC.

Analysis	Parameter	Result	Units	Detection Limit	Prep Method	Prep Date	Analysis Method	Analysis Date	Analyzed By
TOTALSOLID	Total Solids	85	Percent				EPA 160.3	06/12/1995	NJS
VOC-S-ME	Benzene	5800	ug/kg	290		06/12/1995	SW846 8020	06/13/1995	PMS
	Ethyl Benzene	18000	ug/kg	290					
	Methyl-tert-butyl ether	890	ug/kg	290					
	Toluene	48000	ug/kg	290					
	1,2,4-trimethylbenzene	45000	ug/kg	290					
	1,3,5-trimethylbenzene	14000	ug/kg	290					
	Xylenes, m + p	62000	ug/kg	290					
	Xylene, o	25000	ug/kg	290					
RO-S	Gasoline Range Organics(GRO)-Soil	670	mg/kg	29		06/12/1995	WDNR MOD GRO	06/13/1995	PMS
	Blank spike	102	% recov	50					
	Blank spike duplicate	100	% recov	50					
	Soil spike	73	% recov	50					
RO-S	Diesel Range Organics(DRO)-Soil	120	mg/kg	7.0		06/09/1995	WDNR MOD DRO	06/13/1995	NJS
	Blank spike	101	% recov	50					
	Blank spike duplicate	101	% recov	50					
	Soil spike	89	% recov	50					

"ND" Indicates no detectable analyte at or above the listed detection limit. All results reported on a dry weight basis. All subcontracted analyses are performed by Wisconsin DNR certified laboratories.

These results have been reviewed and their authenticity verified by:

*Wade Millberg*







SEP 05 1995

LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-01

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-103 (3)

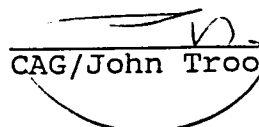
PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/17/95 11:30:00  
DATE RECEIVED: 08/18/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	6.9	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: Date: 08/28/95 10:11:00	5.5	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	82	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	85.5	0.1	Weight %

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-01

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-103 (3)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/17/95 11:30:00  
DATE RECEIVED: 08/18/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Dichlorodifluoromethane	ND	14.5	µg/Kg
Chloromethane	ND	4.0	µg/Kg
Vinyl chloride	ND	9.0	µg/Kg
Chloroethane	ND	26.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	6.5	µg/Kg
Methylene Chloride	B 9	4.0	µg/Kg
trans-1,2-Dichloroethene	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	3.5	µg/Kg
2,2-Dichloropropane	ND	2.5	µg/Kg
cis-1,2-Dichloroethene	ND	0.5	µg/Kg
Chloroform	ND	2.5	µg/Kg
1,1,1-Trichloroethane	ND	1.5	µg/Kg
Carbon Tetrachloride	ND	6.0	µg/Kg
Benzene	ND	10.0	µg/Kg
1,2-Dichloroethane	ND	1.5	µg/Kg
Trichloroethene	ND	6.0	µg/Kg
1,2-Dichloropropane	ND	2.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Toluene	ND	10.0	µg/Kg
1,1,2-Trichloroethane	ND	1.0	µg/Kg
Tetrachloroethene	ND	1.5	µg/Kg
1,3-Dichloropropane	ND	1.5	µg/Kg
Dibromochloromethane	ND	4.5	µg/Kg
1,2-Dibromoethane	ND	4.0	µg/Kg
Chlorobenzene	ND	12.5	µg/Kg
Ethyl benzene	ND	10.0	µg/Kg
M and P Xylene	ND	10.0	µg/Kg
O-Xylene	ND	10.0	µg/Kg
Isopropylbenzene	ND	10.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	µg/Kg
n-Propyl benzene	ND	0.5	µg/Kg
Bromobenzene	ND	1.5	µg/Kg
1,3,5-Trimethylbenzene	ND	1.0	µg/Kg
2-Chlorotoluene	ND	0.5	µg/Kg
4-Chlorotoluene	ND	1.0	µg/Kg
tert-Butylbenzene	ND	3.0	µg/Kg
1,2,4-Trimethylbenzene	ND	2.5	µg/Kg

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-01

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-103 (3)

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	MDL*	
sec-Butylbenzene	ND	1.0	µg/Kg
p-Isopropyltoluene	ND	0.5	µg/Kg
1,3-Dichlorobenzene	ND	16.0	µg/Kg
1,4-Dichlorobenzene	ND	12.0	µg/Kg
n-Butylbenzene	ND	1.0	µg/Kg
1,2-Dichlorobenzene	ND	7.5	µg/Kg
1,2-Dibromo-3-chloropropane	ND	150	µg/Kg
1,2,4-Trichlorobenzene	ND	1.5	µg/Kg
Hexachlorobutadiene	ND	1.0	µg/Kg
Naphthalene	ND	3.0	µg/Kg
1,2,3-Trichlorobenzene	ND	1.0	µg/Kg
Di-isopropyl ether	ND	5.0	µg/Kg
Methyl-t-butyl ether	ND	40.0	µg/Kg
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene	110		

ANALYZED BY: PW

DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

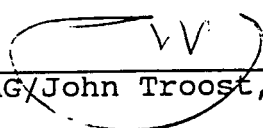
NOTES: \* - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-01

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-103 (3)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/17/95 11:30:00  
 DATE RECEIVED: 08/18/95

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	µg/Kg
Acenaphthylene	ND	0.06	µg/Kg
Acenaphthene	ND	0.06	µg/Kg
Fluorene	ND	0.07	µg/Kg
Phenanthrene	2	0.06	µg/Kg
Anthracene	ND	0.04	µg/Kg
Fluoranthene	2	0.05	µg/Kg
Pyrene	2	0.04	µg/Kg
Chrysene	1	0.02	µg/Kg
Benzo (a) anthracene	0.9	0.01	µg/Kg
Benzo (b) fluoranthene	ND	0.01	µg/Kg
Benzo (k) fluoranthene	ND	0.02	µg/Kg
Benzo (a) pyrene	ND	0.03	µg/Kg
Dibenzo (a,h) anthracene	ND	0.02	µg/Kg
Benzo (g,h,i) perylene	0.9	0.03	µg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	µg/Kg
1-Methylnaphthalene	ND	0.06	µg/Kg
2-Methylnaphthalene	ND	0.06	µg/Kg

SURROGATES

9,10-Diphenylanthracene

% RECOVERY

82

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00  
 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00  
 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
 NOTES: \* - Practical Quantitation Limit ND - Not Detected  
 NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-02

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-102 (3)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/17/95 10:40:00  
 DATE RECEIVED: 08/18/95

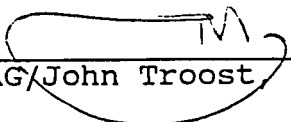
ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	ND	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 04:03:00	ND	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	12	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	85.7	0.1	Weight %

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



Certificate of Analysis No. L1-9508804-02

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-102 (3)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/17/95 10:40:00  
DATE RECEIVED: 08/18/95

PARAMETER	ANALYTICAL DATA		
	RESULTS	MDL*	UNITS
Dichlorodifluoromethane	ND	14.5	µg/Kg
Chloromethane	ND	4.0	µg/Kg
Vinyl chloride	ND	9.0	µg/Kg
Chloroethane	ND	26.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	6.5	µg/Kg
Methylene Chloride	B 9	4.0	µg/Kg
trans-1,2-Dichloroethene	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	3.5	µg/Kg
2,2-Dichloropropane	ND	2.5	µg/Kg
cis-1,2-Dichloroethene	ND	0.5	µg/Kg
Chloroform	ND	2.5	µg/Kg
1,1,1-Trichloroethane	ND	1.5	µg/Kg
Carbon Tetrachloride	ND	6.0	µg/Kg
Benzene	ND	10.0	µg/Kg
1,2-Dichloroethane	ND	1.5	µg/Kg
Trichloroethene	ND	6.0	µg/Kg
1,2-Dichloropropane	ND	2.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Toluene	ND	10.0	µg/Kg
1,1,2-Trichloroethane	ND	1.0	µg/Kg
Tetrachloroethene	ND	1.5	µg/Kg
1,3-Dichloropropane	ND	1.5	µg/Kg
Dibromochloromethane	ND	4.5	µg/Kg
1,2-Dibromoethane	ND	4.0	µg/Kg
Chlorobenzene	ND	12.5	µg/Kg
Ethyl benzene	ND	10.0	µg/Kg
M and P Xylene	ND	10.0	µg/Kg
O-Xylene	ND	10.0	µg/Kg
Isopropylbenzene	ND	10.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	µg/Kg
n-Propyl benzene	ND	0.5	µg/Kg
Bromobenzene	ND	1.5	µg/Kg
1,3,5-Trimethylbenzene	ND	1.0	µg/Kg
2-Chlorotoluene	ND	0.5	µg/Kg
4-Chlorotoluene	ND	1.0	µg/Kg
tert-Butylbenzene	ND	3.0	µg/Kg
1,2,4-Trimethylbenzene	ND	2.5	µg/Kg

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-02

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-102 (3)

ANALYTICAL DATA (continued)			
PARAMETER	RESULTS	MDL*	UNITS
sec-Butylbenzene	ND	1.0	µg/Kg
p-Isopropyltoluene	ND	0.5	µg/Kg
1,3-Dichlorobenzene	ND	16.0	µg/Kg
1,4-Dichlorobenzene	ND	12.0	µg/Kg
n-Butylbenzene	ND	1.0	µg/Kg
1,2-Dichlorobenzene	ND	7.5	µg/Kg
1,2-Dibromo-3-chloropropane	ND	150	µg/Kg
1,2,4-Trichlorobenzene	ND	1.5	µg/Kg
Hexachlorobutadiene	ND	1.0	µg/Kg
Naphthalene	ND	3.0	µg/Kg
1,2,3-Trichlorobenzene	ND	1.0	µg/Kg
Di-isopropyl ether	ND	5.0	µg/Kg
Methyl-t-butyl ether	ND	40.0	µg/Kg
SURROGATES		% RECOVERY	
Fluorobenzene		108	

ANALYZED BY: PW

DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]


NOTES: \* - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-03

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-105 (3)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/16/95 13:50:00  
 DATE RECEIVED: 08/18/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	ND	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 04:50:00	ND	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	19	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	81.0	0.1	Weight %

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager





Certificate of Analysis No. L1-9508804-03

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-105 (3)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/16/95 13:50:00  
DATE RECEIVED: 08/18/95

PARAMETER	ANALYTICAL DATA		
	RESULTS	MDL*	UNITS
Dichlorodifluoromethane	ND	14.5	µg/Kg
Chloromethane	ND	4.0	µg/Kg
Vinyl chloride	ND	9.0	µg/Kg
Chloroethane	ND	26.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	6.5	µg/Kg
Methylene Chloride	B 10	4.0	µg/Kg
trans-1,2-Dichloroethene	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	3.5	µg/Kg
2,2-Dichloropropane	ND	2.5	µg/Kg
cis-1,2-Dichloroethene	ND	0.5	µg/Kg
Chloroform	ND	2.5	µg/Kg
1,1,1-Trichloroethane	ND	1.5	µg/Kg
Carbon Tetrachloride	ND	6.0	µg/Kg
Benzene	ND	10.0	µg/Kg
1,2-Dichloroethane	ND	1.5	µg/Kg
Trichloroethene	ND	6.0	µg/Kg
1,2-Dichloropropane	ND	2.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Toluene	ND	10.0	µg/Kg
1,1,2-Trichloroethane	ND	1.0	µg/Kg
Tetrachloroethene	ND	1.5	µg/Kg
1,3-Dichloropropane	ND	1.5	µg/Kg
Dibromochloromethane	ND	4.5	µg/Kg
1,2-Dibromoethane	ND	4.0	µg/Kg
Chlorobenzene	ND	12.5	µg/Kg
Ethyl benzene	ND	10.0	µg/Kg
M and P Xylene	ND	10.0	µg/Kg
O-Xylene	ND	10.0	µg/Kg
Isopropylbenzene	ND	10.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	µg/Kg
n-Propyl benzene	ND	0.5	µg/Kg
Bromobenzene	ND	1.5	µg/Kg
1,3,5-Trimethylbenzene	ND	1.0	µg/Kg
2-Chlorotoluene	ND	0.5	µg/Kg
4-Chlorotoluene	ND	1.0	µg/Kg
tert-Butylbenzene	ND	3.0	µg/Kg
1,2,4-Trimethylbenzene	ND	2.5	µg/Kg

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-03

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-105 (3)

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	MDL*	UNITS
sec-Butylbenzene	ND	1.0	µg/Kg
p-Isopropyltoluene	ND	0.5	µg/Kg
1,3-Dichlorobenzene	ND	16.0	µg/Kg
1,4-Dichlorobenzene	ND	12.0	µg/Kg
n-Butylbenzene	ND	1.0	µg/Kg
1,2-Dichlorobenzene	ND	7.5	µg/Kg
1,2-Dibromo-3-chloropropane	ND	150	µg/Kg
1,2,4-Trichlorobenzene	ND	1.5	µg/Kg
Hexachlorobutadiene	ND	1.0	µg/Kg
Naphthalene	ND	3.0	µg/Kg
1,2,3-Trichlorobenzene	ND	1.0	µg/Kg
Di-isopropyl ether	ND	5.0	µg/Kg
Methyl-t-butyl ether	ND	40.0	µg/Kg

**SURROGATES**  
 Fluorobenzene

**% RECOVERY**  
 108

ANALYZED BY: PW

DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]


NOTES: \* - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

**QUALITY ASSURANCE:** Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-03

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-105 (3)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/16/95 13:50:00  
 DATE RECEIVED: 08/18/95

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	ND	0.06	µg/Kg
Acenaphthylene	ND	0.06	µg/Kg
Acenaphthene	ND	0.06	µg/Kg
Fluorene	ND	0.07	µg/Kg
Phenanthrene	ND	0.06	µg/Kg
Anthracene	ND	0.04	µg/Kg
Fluoranthene	ND	0.05	µg/Kg
Pyrene	ND	0.04	µg/Kg
Chrysene	ND	0.02	µg/Kg
Benzo (a) anthracene	ND	0.01	µg/Kg
Benzo (b) fluoranthene	ND	0.01	µg/Kg
Benzo (k) fluoranthene	ND	0.02	µg/Kg
Benzo (a) pyrene	ND	0.03	µg/Kg
Dibenzo (a,h) anthracene	ND	0.02	µg/Kg
Benzo (g,h,i) perylene	ND	0.03	µg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	µg/Kg
1-Methylnaphthalene	ND	0.06	µg/Kg
2-Methylnaphthalene	ND	0.06	µg/Kg

SURROGATES

9,10-Diphenylanthracene

% RECOVERY

80

ANALYZED BY: SJ

DATE/TIME: 08/24/95 16:24:00

EXTRACTED BY: BD

DATE/TIME: 08/23/95 11:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons


NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-04

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-101 (3)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/16/95 10:20:00  
 DATE RECEIVED: 08/18/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	ND	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 05:38:00	ND	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/22/95 09:42:00	37	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	80.3	0.1	Weight %

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager



Certificate of Analysis No. L1-9508804-04

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-101 (3)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/16/95 10:20:00  
DATE RECEIVED: 08/18/95

PARAMETER	ANALYTICAL DATA		
	RESULTS	MDL*	UNITS
Dichlorodifluoromethane	ND	14.5	µg/Kg
Chloromethane	ND	4.0	µg/Kg
Vinyl chloride	ND	9.0	µg/Kg
Chloroethane	ND	26.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	6.5	µg/Kg
Methylene Chloride	B 9	4.0	µg/Kg
trans-1,2-Dichloroethene	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	3.5	µg/Kg
2,2-Dichloropropane	ND	2.5	µg/Kg
cis-1,2-Dichloroethene	ND	0.5	µg/Kg
Chloroform	ND	2.5	µg/Kg
1,1,1-Trichloroethane	ND	1.5	µg/Kg
Carbon Tetrachloride	ND	6.0	µg/Kg
Benzene	ND	10.0	µg/Kg
1,2-Dichloroethane	ND	1.5	µg/Kg
Trichloroethene	ND	6.0	µg/Kg
1,2-Dichloropropane	ND	2.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Toluene	ND	10.0	µg/Kg
1,1,2-Trichloroethane	ND	1.0	µg/Kg
Tetrachloroethene	ND	1.5	µg/Kg
1,3-Dichloropropane	ND	1.5	µg/Kg
Dibromochloromethane	ND	4.5	µg/Kg
1,2-Dibromoethane	ND	4.0	µg/Kg
Chlorobenzene	ND	12.5	µg/Kg
Ethyl benzene	ND	10.0	µg/Kg
M and P Xylene	ND	10.0	µg/Kg
O-Xylene	ND	10.0	µg/Kg
Isopropylbenzene	ND	10.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	µg/Kg
n-Propyl benzene	ND	0.5	µg/Kg
Bromobenzene	ND	1.5	µg/Kg
1,3,5-Trimethylbenzene	ND	1.0	µg/Kg
2-Chlorotoluene	ND	0.5	µg/Kg
4-Chlorotoluene	ND	1.0	µg/Kg
tert-Butylbenzene	ND	3.0	µg/Kg
1,2,4-Trimethylbenzene	ND	2.5	µg/Kg

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



Certificate of Analysis No. L1-9508804-04

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-101 (3)

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	MDL*	
sec-Butylbenzene	ND	1.0	µg/Kg
p-Isopropyltoluene	ND	0.5	µg/Kg
1,3-Dichlorobenzene	ND	16.0	µg/Kg
1,4-Dichlorobenzene	ND	12.0	µg/Kg
n-Butylbenzene	ND	1.0	µg/Kg
1,2-Dichlorobenzene	ND	7.5	µg/Kg
1,2-Dibromo-3-chloropropane	ND	150	µg/Kg
1,2,4-Trichlorobenzene	ND	1.5	µg/Kg
Hexachlorobutadiene	ND	1.0	µg/Kg
Naphthalene	ND	3.0	µg/Kg
1,2,3-Trichlorobenzene	ND	1.0	µg/Kg
Di-isopropyl ether	ND	5.0	µg/Kg
Methyl-t-butyl ether	ND	40.0	µg/Kg
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene		109	

ANALYZED BY: PW

DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

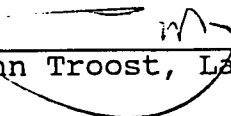
NOTES: \* - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-04

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-101 (3)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/16/95 10:20:00  
 DATE RECEIVED: 08/18/95

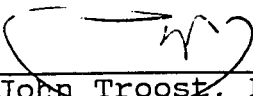
ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	0.9	0.06	µg/Kg
Acenaphthylene	ND	0.06	µg/Kg
Acenaphthene	ND	0.06	µg/Kg
Fluorene	ND	0.07	µg/Kg
Phenanthrene	4	0.06	µg/Kg
Anthracene	ND	0.04	µg/Kg
Fluoranthene	11	0.05	µg/Kg
Pyrene	10	0.04	µg/Kg
Chrysene	8	0.02	µg/Kg
Benzo (a) anthracene	5	0.01	µg/Kg
Benzo (b) fluoranthene	8	0.01	µg/Kg
Benzo (k) fluoranthene	3	0.02	µg/Kg
Benzo (a) pyrene	6	0.03	µg/Kg
Dibenzo (a,h) anthracene	ND	0.02	µg/Kg
Benzo (g,h,i) perylene	ND	0.03	µg/Kg
Indeno (1,2,3-cd) pyrene	ND	0.02	µg/Kg
1-Methylnaphthalene	0.5	0.06	µg/Kg
2-Methylnaphthalene	0.4	0.06	µg/Kg
<b>SURROGATES</b>	<b>% RECOVERY</b>		
9,10-Diphenylanthracene	81		

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00  
 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00  
 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
 NOTES: \* - Practical Quantitation Limit ND - Not Detected  
 NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508804-05

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: METHANOL BLANK

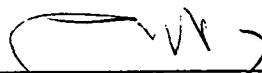
PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED:  
 DATE RECEIVED: 08/18/95

ANALYTICAL DATA				
PARAMETER	RESULTS	DETECTION LIMIT	UNITS	
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/21/95 12:24:00	ND	5	mg/Kg	

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troest, Laboratory Manager





\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
EPA 8310

PAGE

Matrix: Soil  
Units: µg/Kg

Batch Id: HPLC950824162400

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Naphthalene	ND	3.30	2.72	82.4	30 - 122
Acenaphthylene	ND	3.30	2.94	89.1	30 - 126
Acenaphthene	ND	3.30	2.81	85.2	30 - 124
Fluorene	ND	3.30	3.15	95.5	30 - 142
Phenanthrene	ND	3.30	2.85	86.4	30 - 155
Anthracene	ND	3.30	1.98	60.0	30 - 126
Fluoranthene	ND	3.30	2.62	79.4	30 - 123
Pyrene	ND	3.30	2.80	84.8	30 - 140
Chrysene	ND	3.30	2.81	85.2	30 - 199
Benzo (a) anthracene	ND	3.30	2.83	85.8	30 - 135
Benzo (b) fluoranthene	ND	3.30	2.70	81.8	30 - 150
Benzo (k) fluoranthene	ND	3.30	2.70	81.8	30 - 159
Benzo (a) pyrene	ND	3.30	2.47	74.8	30 - 128
Dibenzo (a,h) anthracene	ND	3.30	2.64	80.0	30 - 110
Benzo (g,h,i) perylene	ND	3.30	2.81	85.2	30 - 116
Indeno (1,2,3-cd) pyrene	ND	3.30	2.59	78.5	30 - 116
1-Methylnaphthalene	ND	3.30	2.81	85.2	30 - 130
2-Methylnaphthalene	ND	3.30	3.15	95.5	30 - 130

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			NAPHTHALENE	3.5	3.30	4.91		42.7	4.11
ACENAPHTHYLENE	ND	3.30	2.43	73.6	2.82	85.5	15.0	30	30 - 126
ACENAPHTHENE	ND	3.30	2.94	89.1	2.56	77.6	13.8	30	30 - 124
FLUORENE	ND	3.30	2.28	69.1	2.13	64.5	6.89	30	30 - 142
PHENANTHRENE	ND	3.30	3.20	97.0	2.74	83.0	15.6	30	30 - 155
ANTHRACENE	ND	3.30	2.12	64.2	2.03	61.5	4.30	30	30 - 126
FLUORANTHENE	ND	3.30	2.80	84.8	2.15	65.2	26.1	30	30 - 123
PYRENE	ND	3.30	3.20	97.0	3.12	94.5	2.61	30	30 - 140
CHRYSENE	0.5	3.30	3.93	104	2.46	59.4	54.6 *	30	30 - 199
BENZO (A) ANTHRACENE	ND	3.30	2.84	86.1	2.47	74.8	14.0	30	30 - 135
BENZO (B) FLUORANTHENE	ND	3.30	3.84	116	3.63	110	5.31	30	30 - 150
BENZO (K) FLUORANTHENE	ND	3.30	2.90	87.9	2.35	71.2	21.0	30	30 - 159
BENZO (A) PYRENE	ND	3.30	2.45	74.2	2.81	85.2	13.8	30	30 - 128
DIBENZO (A,H) ANTHRACENE	ND	3.30	2.76	83.6	2.30	69.7	18.1	30	30 - 130
BENZO (G,H,I) PERYLENE	ND	3.30	3.22	97.6	2.45	74.2	27.2	30	30 - 130
INDENO (1,2,3-CD) PYRENE	ND	3.30	2.40	72.7	2.10	63.6	13.4	30	30 - 116

*Karen Grizzaffi*  
Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 EPA 8310

PAGE

0

Matrix: Soil  
 Units: µg/Kg

Batch Id: HPLC950824162400

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			1-METHYLNAPHTHALENE	ND	3.30	3.86		117	3.24
2-METHYLNAPHTHALENE	ND	3.30	4.20	127	3.80	115	9.92	30	30 - 130

Analyst: SJ

Sequence Date: 08/24/95

SPL ID of sample spiked: 9508814-05A

Sample File ID: 9508240120101

Method Blank File ID:

Blank Spike File ID: 9508250160101

Matrix Spike File ID: 9508250170101

Matrix Spike Duplicate File ID: 9508290030101

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [( <1> - <2> ) / <3> ] x 100

LCS % Recovery = ( <1> / <3> ) x 100

Relative Percent Difference = |(<4> - <5> | / [( <4> + <5> ) x 0.5] x 100

(\*\*) = Source: 8310 SW846

(\*\*\*) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508814-04A 9508814-05A 9508822-01C 9508822-02B  
 9508822-03C 9508822-04C 9508804-01C 9508804-02C  
 9508804-03C 9508804-04C 9508814-01A 9508814-02A  
 9508814-03A

Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 Method Mod. 8021 \*\*\*

PAGE

Matrix: Soil  
 Units: µg/Kg

Batch Id: HP00950829172700

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
DICHLORODIFLUOROMETHANE	ND	15.0	10.1588	67.7	50 - 140
CHLOROMETHANE	ND	15.0	11.9650	79.8	50 - 140
VINYL CHLORIDE	ND	15.0	14.1999	94.7	50 - 140
BROMOMETHANE	ND	15.0	14.0690	93.8	50 - 140
CHLOROETHANE	ND	15.0	13.8967	92.6	50 - 140
TRICHLOROFLUOROMETHANE	ND	15.0	13.3424	88.9	50 - 140
1,1-DICHLOROETHENE	ND	15.0	14.0249	93.5	50 - 140
METHYLENE CHLORIDE	8.7282	15.0	14.3194	95.5	50 - 140
TRANS-1,2-DICHLOROETHENE	ND	15.0	14.3523	95.7	50 - 140
1,1-DICHLOROETHANE	ND	15.0	15.6520	104	50 - 140
2,2-DICHLOROPROPANE	ND	15.0	15.6170	104	50 - 140
CIS-1,2-DICHLOROETHENE	ND	15.0	16.6364	111	50 - 140
CHLOROFORM	ND	15.0	16.1993	108	50 - 140
BROMOCHLOROMETHANE	ND	15.0	13.2430	88.3	50 - 140
1,1,1-TRICHLOROETHANE	ND	15.0	13.9952	93.3	50 - 140
1,1-DICHLOROPROPENE	ND	15.0	13.8919	92.6	50 - 140
CARBON TETRACHLORIDE	ND	15.0	14.2044	94.7	50 - 140
BENZENE	ND	15.0	14.7653	98.4	50 - 140
1,2-DICHLOROETHANE	ND	15.0	13.6859	91.2	50 - 140
TRICHLOROETHENE	ND	15.0	14.0374	93.6	50 - 140
1,2-DICHLOROPROPANE	ND	15.0	14.0022	93.3	50 - 140
BROMODICHLOROMETHANE	ND	15.0	14.1002	94.0	50 - 140
DIBROMOMETHANE	ND	15.0	10.5000	70.0	50 - 140
CIS-1,3-DICHLOROPROPENE	ND	15.0	13.8845	92.6	50 - 140
TOLUENE	ND	15.0	14.8498	99.0	50 - 140
TRANS-1,3-DICHLOROPROPENE	ND	15.0	13.6615	91.1	50 - 140
1,1,2-TRICHLOROETHANE	ND	15.0	14.2644	95.1	50 - 140
TETRACHLOROETHENE	ND	15.0	14.2262	94.8	50 - 140
1,3-DICHLOROPROPANE	ND	15.0	13.2212	88.1	50 - 140
DIBROMOCHLOROMETHANE	ND	15.0	14.6579	97.7	50 - 140
1,2-DIBROMOETHANE	ND	15.0	13.8998	92.7	50 - 140
CHLOROBENZENE	ND	15.0	14.0715	93.8	50 - 140
ETHYL BENZENE	ND	15.0	15.1737	101	50 - 140
1,1,1,2-TETRACHLOROETHANE	ND	15.0	14.0873	93.9	50 - 140
M AND P XYLENE	ND	30.0	29.0101	96.7	50 - 140
O-XYLENE	ND	15.0	14.8202	98.8	50 - 140
STYRENE	ND	15.0	14.1552	94.4	50 - 140
ISOPROPYLBENZENE	ND	15.0	13.4352	89.6	50 - 140
BROMOFORM	ND	15.0	15.4367	103	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND	15.0	13.8460	92.3	50 - 140
1,2,3-TRICHLOROPROPANE	ND	15.0	16.4965	110	50 - 140
N-PROPYL BENZENE	ND	15.0	16.5424	110	50 - 140

*Karen Grizzaffi*  
 Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method Mod. 8021 \*\*\*

Matrix: Soil  
Units: µg/Kg

Batch Id: HPO0950829172700

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
BROMOBENZENE	ND	15.0	15.8126	105	50 - 140
1,3,5-TRIMETHYLBENZENE	ND	15.0	18.0975	121	50 - 140
2-CHLOROTOLUENE	ND	15.0	15.5191	103	50 - 140
4-CHLOROTOLUENE	ND	15.0	16.1557	108	50 - 140
TERT-BUTYLBENZENE	ND	15.0	16.3752	109	50 - 140
1,2,4-TRIMETHYLBENZENE	ND	15.0	13.5072	90.0	50 - 140
SEC-BUTYLBENZENE	ND	15.0	13.4839	89.9	50 - 140
P-ISOPROPYLTOLUENE	ND	15.0	13.4162	89.4	50 - 140
1,3-DICHLOROBENZENE	ND	15.0	13.5831	90.6	50 - 140
1,4-DICHLOROBENZENE	ND	15.0	12.7529	85.0	50 - 140
N-BUTYLBENZENE	ND	15.0	14.2348	94.9	50 - 140
1,2-DICHLOROBENZENE	ND	15.0	14.5364	96.9	50 - 140
1,2-DIBROMO-3-CHLOROPROPAN	ND	15.0	20.1710	134	50 - 140
1,2,4-TRICHLOROBENZENE	ND	15.0	20.4816	137	50 - 140
HEXACHLOROBUTADIENE	ND	15.0	17.6380	118	50 - 140
NAPHTHALENE	ND	15.0	20.1513	134	50 - 140
1,2,3-TRICHLOROBENZENE	ND	15.0	12.9749	86.5	50 - 140

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
VINYL CHLORIDE	ND	25.0	26.8906	108	22.0159	88.1	20.3	30	50 - 140
CHLOROETHANE	ND	25.0	14.8107	59.2	22.7840	91.1	42.4 *	30	50 - 140
METHYLENE CHLORIDE	8.7282	25.0	27.7291	76.0	30.8540	88.5	15.2	30	50 - 140
1,1-DICHLOROETHANE	ND	25.0	18.1752	72.7	22.2111	88.8	19.9	30	50 - 140
CHLOROFORM	ND	25.0	19.0732	76.3	25.7030	103	29.8	30	50 - 140
1,1,1-TRICHLOROETHANE	ND	25.0	24.5692	98.3	29.4020	118	18.2	30	50 - 140
CARBON TETRACHLORIDE	ND	25.0	28.9150	116	30.8402	123	5.86	30	50 - 140
BENZENE	ND	25.0	27.6560	111	25.0683	100	10.4	30	50 - 140
1,2-DICHLOROETHANE	ND	25.0	25.0978	100	22.7409	91.0	9.42	30	50 - 140
TRICHLOROETHENE	ND	25.0	30.7148	123	31.6990	127	3.20	30	50 - 140
BROMODICHLOROMETHANE	ND	25.0	27.4625	110	28.2521	113	2.69	30	50 - 140
TOLUENE	ND	25.0	27.3918	110	25.3227	101	8.53	30	50 - 140
1,1,2-TRICHLOROETHANE	ND	25.0	23.5156	94.1	21.8858	87.5	7.27	30	50 - 140
TETRACHLOROETHENE	ND	25.0	29.9327	120	31.7590	127	5.67	30	50 - 140
CHLOROBENZENE	ND	25.0	25.8011	103	25.4625	102	0.976	30	50 - 140
ETHYL BENZENE	ND	25.0	25.4383	102	23.5165	94.1	8.06	30	50 - 140
M AND P XYLENE	ND	50.0	49.000	98.0	48.6036	97.2	0.820	30	50 - 140

*Karen Grizzaffi*  
Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method Mod. 8021 \*\*\*

Matrix: Soil  
Units: µg/Kg

Batch Id: HPO0950829172700

M A T R I X   S P I K E S

S P I K E C O M P O U N D S	Sample Results  <2>	Spike Added  <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result	Recovery	Result	Recovery		RPD Max.	Recovery Range
			<1>	<4>	<1>	<5>			
O-XYLENE	ND	25.0	25.0766	100	25.0744	100	0	30	50 - 140
ISOPROPYLBENZENE	ND	25.0	24.2426	97.0	25.1598	101	4.04	30	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND	25.0	20.6120	82.4	20.7195	82.9	0.605	30	50 - 140
SEC-BUTYLBENZENE	ND	25.0	23.5101	94.0	25.4000	102	8.16	30	50 - 140
P-ISOPROPYLTOLUENE	ND	25.0	20.4315	81.7	25.0284	100	20.1	30	50 - 140
1,3-DICHLOROBENZENE	ND	25.0	22.3167	89.3	23.9584	95.8	7.02	30	50 - 140
1,4-DICHLOROBENZENE	ND	25.0	19.2137	76.9	24.8694	99.5	25.6	30	50 - 140
N-BUTYLBENZENE	ND	25.0	22.9546	91.8	22.2006	88.8	3.32	30	50 - 140
1,2-DICHLOROBENZENE	ND	25.0	19.8557	79.4	22.5870	90.3	12.8	30	50 - 140
NAPHTHALENE	ND	25.0	20.2	80.8	16.8222	67.3	18.2	30	50 - 140

Analyst: PW

Sequence Date: 08/29/95

SPL ID of sample spiked: MBLANK

Sample File ID: \EH29202.ra

Method Blank File ID:

Blank Spike File ID: \EH29204.ra

Matrix Spike File ID: \EH29214.ra

Matrix Spike Duplicate File ID: \EH29204.ra

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [( <1> - <2> ) / <3> ] x 100

LCS % Recovery = ( <1> / <3> ) x 100

Relative Percent Difference = [ ( <4> - <5> ) / [ ( <4> + <5> ) x 0.5 ] ] x 100

(\*\*) = Source: SPL Lafayette, 11/94

(\*\*\*) = Source: SPL Lafayette, 11/94

SAMPLES IN BATCH(SPL ID):

9508822-01A 9508822-03A 9508822-04A 9508804-01A  
9508804-02A 9508804-03A 9508804-04A 9508822-01A

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/23/95

Analyzed on: 08/21/95

Analyst: TB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Gasoline Range Organics  
WI LUST GRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508716-01A	ND	5.0	64.0	82.0	25	60 - 130	20

FID8950821122400-9508985

Samples in batch:

9508804-01A 9508804-02A 9508804-03A 9508804-04A  
9508804-05A

COMMENTS:

SAMPLE VIAL FOR MS CRACKED.

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/23/95

Analyzed on: 08/21/95

Analyst: TB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Gasoline Range Organics  
WI LUST GRO #

SPL Sample ID Number	Blank Value mg/Kg	LCS Concentration mg/Kg	Measured Concentration mg/Kg	% Recovery	QC Limits Recovery
LCS	ND	2.5	2.5	100	60 - 130

FIDB950821122400-9508986

amples in batch:

9508804-01A 9508804-02A 9508804-03A 9508804-04A  
9508804-05A

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/26/95

Analyst: AH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Diesel Range Organics  
 WI LUST DRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
BLANK_SPIKE	8.0	40	82.5	85.0	3.0	50 - 130	30

TPHD950821100000-9508089

Samples in batch:

9508804-01B 9508804-02B 9508804-03B 9508804-04B  
 9508822-01B 9508822-03B 9508822-04B

COMMENTS:

METHOD BLANK CONTRIBUTION OF LESS THAN 5 TIMES OF THE DETECTION LIMIT. UNABLE TO REEXTRACT DUE TO NO MORE SAMPLE AVAILABLE.

SPL, Incorporated

Karen Grizzaffi, QC Officer





\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/22/95

Analyzed on: 08/22/95

Analyst: EH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total  
 Method 7420 \*\*\*

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508759-01B	ND	100	100	100	0	80 - 120	20

3100950822094200-9508955

Samples in batch:

9508759-01B    9508759-02B    9508790-01A    9508804-01D  
 9508804-02D    9508804-03D    9508804-04D    9508810-01A

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/29/95

Analyst: DB

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Solids  
 Method 2540G \*\*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration %	Duplicate Sample %	RPD	RPD Max.
9508B41-18A	88.3	88.3	0	20

TSOL950829160000-9508E21

Samples in batch:

9508804-01D    9508804-02D    9508804-03D    9508804-04D  
 9508822-01D    9508822-02D    9508822-03D    9508822-04D  
 9508B41-09A    9508B41-10A    9508B41-11A    9508B41-12A  
 9508B41-13A    9508B41-14A    9508B41-15A    9508B41-16A  
 9508B41-17A    9508B41-18A

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE LAB  
 P.O. BOX 31780  
 LAFAYETTE, LA  
 ZIP 70593-1780  
 PHONE: (318) 984 25

PL CHEST # \_\_\_\_\_

ENVIRONMENTAL LABORATORY

DATE 8-18-95

CLIENT CHEST: YES/NO

SAMPLE LOGIN CHECKLIST

	YES	NO
1) IS A CHAIN-OF CUSTODY FORM PRESENT:	<u>✓</u>	_____
2) IS THE COC PROPERLY COMPLETED:	<u>✓</u>	_____
IF NO, DESCRIBE WHAT IS INCOMPLETE:	_____	_____

3) HAS CLIENT BEEN CONTACTED ABOUT INCOMPLETE COC:	_____	_____
4) IS AIRBILL/PACKING LIST/BILL OF LADING ATTACHED TO SHIPMENT:	<u>✓</u>	_____
IF YES, ID# <u>6501903866 Fed-x</u>	_____	_____

5) ARE CUSTODY SEALS PRESENT ON THE PACKAGE:	_____	<u>✓</u>
IF YES, ARE THEY INTACT UPON RECEIPT:	_____	<u>✓</u>

6) ARE ALL SAMPLES TAGGED OR LABELED:	<u>✓</u>	_____
DO THE LABELS MATCH THE COC:	<u>✓</u>	_____
IF NO, HAS CLIENT BEEN CONTACTED ABOUT IT:	_____	_____
(PLACE SUBSEQUENT DOCUMENTATION FROM CLIENT IN REMARKS)	_____	_____

7) DO ALL SHIPPING DOCUMENTS AGREE:	<u>✓</u>	_____
IF NO, DESCRIBE WHAT IS IN NONCONFORMITY:	_____	_____

8) CONDITION/TEMPERATURE OF SHIPPING CONTAINER:	<u>OK 4°C</u>	<u>8-2-95</u> <u>MT-6</u> <u>30</u> <u>9</u>
---	---------------	---

9) CONDITION OF SAMPLE CONTAINERS:	<u>OK</u>	_____
------------------------------------	-----------	-------

10) SAMPLE DISPOSAL: SPL <u>✓</u> RETURN TO CLIENT _____	REMARKS/CONTACT/PHONE/DATE: _____
--	-----------------------------------

CO.: Environ Res. Tech. Int. REPTS TO: \_\_\_\_\_ INV. TO: \_\_\_\_\_

ROJ #: 1096 ATTN: \_\_\_\_\_ ATTN: \_\_\_\_\_

PROJ LOC.: WI ADDR: \_\_\_\_\_ ADDR: \_\_\_\_\_

SPL REP.: Seth CTY/ST: \_\_\_\_\_ CTY/ST: \_\_\_\_\_

4508804

CHAIN OF CUSTODY RECORD

Sample Collectors(s)/Signature(s): REBECCA J. KIEPKE / [Signature]  
 Laboratory Samples are Being Submitted To: SPL  
 Quote Number/Addendum Number CITGO Attached: YES \_\_\_ NO \_\_\_

Site Name: CITGO TERM Send Report To: TIM MUELLER Project Number: 1096  
 Site Address: 9235 N. 107 STREET MILWAUKEE WI  
 Project Manager: TIM MUELLER Natural Resource Technology, Inc. 23713 W. Paul Road Pewaukee, WI 53072 Telephone (414) 523-9000 Fax (414) 523-9001  
 Task Number: \_\_\_\_\_

Temperature of temperature blank \_\_\_\_\_  
 If sample(s) were received on ice and there was ice remaining, you may report the temperature as "received on ice". If all of the ice was melted, the temperature of the melt may be substituted for a temperature blank.

I hereby certify that I received, properly handled, and maintained custody of these samples as noted below:

Relinquished By (Signature): <u>[Signature]</u>	Date/Time: <u>08/17/95 0745</u>	Received By (Signature): <u>FED EX</u>	Date/Time: <u>0501903860</u>
Relinquished By (Signature): _____	Date/Time: _____	Received By (Signature): _____	Date/Time: _____
Relinquished By (Signature): _____	Date/Time: _____	Received By (Signature): <u>[Signature]</u>	Date/Time: <u>8-18-95 1025</u>

Analytical Method / Numbers  
DRO (WI MOD)  
GRD (WI MOD)  
VOCs (WI LIST)  
PAH (WI LIST)  
TOTAL LEAD

Field ID Number	Date Collected	Time Collected	Sample		Location / Description	PID Reading	Field Comments	Preserv. Type	# of Cont.	Analytical Method / Numbers										Lab ID Number	Sample Conditions @ Laboratory				
			Media	Device						DRO (WI MOD)	GRD (WI MOD)	VOCs (WI LIST)	PAH (WI LIST)	TOTAL LEAD											
MW-103(3)	08/17/95	1130	SOIL	SS					5	X	X	X	X	X											
MW-102(3)	08/17/95	1040	SOIL	SS					5	X	X	X	X	X											
MW-105(3)	08/16/95	1350	SOIL	SS					5	X	X	X	X	X											
MW-101(3)	08/16/95	1020	SOIL	SS					5	X	X	X	X	X											
METHANOL	BLANK								1	X	X	X	X	X											

8/25  
DROS  
PRADS  
GRDS  
SOILS  
LEAD  
PAHs  
POST  
POST

SPECIAL INSTRUCTIONS: \_\_\_\_\_  
 Laboratory shall retain samples for 30 days after issuing analytical report unless indicated otherwise below:  
 \_\_\_ Return \_\_\_ Other \_\_\_\_\_

LAFAYETTE, LA  
 P.O. BOX 31750  
 LAFAYETTE, LA  
 ZIP 70503-1750  
 PHONE 337-483-1111

TORY DATE 8-18-95  
 ST YES NO

COC:  
 ACHED

NT IN REMARKS)

\$2.0  
 M10  
 3/9

ER:

RETURN TO CLIENT

INV. TO:

ATTN:

ADDR:

CTY/ST

**FedEx** USA Airbill

Tracking Number **6501903866**

1 From 08/17/95

Sender's Name REBECCA J. KOEPKE Phone 1424774-7695

Company ATLANTIC RESOURCE TECH INC Dept/Floor  Suite/Room

Address 23713 WEST PAUL ROAD

City DELAWARE State DE Zip 19722

2 Your Internal Billing Reference Information

3 To SAMPLE RECEIVING Phone (318) 237-4775

Recipient's Name SPL, Inc. Dept/Floor  Suite/Room

Address 500 Ambassador Caffery Pkwy.

City SCOT State LA Zip 70583-8544

For "HOLD" Service check here  
 Weekday  Saturday

For Saturday Delivery check here

4 Service  
 FedEx Priority Overnight  
 FedEx Standard Overnight  
 FedEx Govt. Overnight  
 FedEx Overnight Freight  
 FedEx 2Day Freight

5 Packaging  
 FedEx Letter\*  FedEx Pak\*  FedEx Box  FedEx Tube  Other Packaging

6 Special Handling  
 Does this shipment contain dangerous goods?  No  Yes  
 Dry Ice  Fragile  High Value  Signature Required  Signature Required for Return  Signature Required for Release  
 Hazardous Goods (Shipper's Declaration not required)  CA-2 Cargo Aircraft Only

7 Payment  
 Bill to:  Sender  Recipient  Third Party  Credit Card  Cash/Check

Total Packages 1 Total Weight 27.7 Total Declared Value \$ 00 Total Charges \$ 00  
 \*When declared value is more than \$100 per package, shipper pays additional charge. See SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY for further information.

8 Release Signature

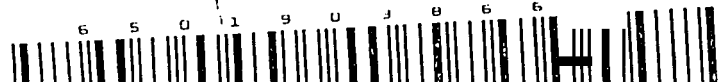
CO.: Atlantic Res. Tech REPTS TO:

ATTN:

ADDR:

PROJ #: 1096

COMPANY: ATI



194



# SAMPLE BOTTLE REQUEST

9568804

SPL, Inc.  
500 Ambassador Caffery Pkwy.  
Scott, LA 70583-8544  
Ph.: (318) 237-4775, Fax: 237-7080

10F 2

### SHIP TO:

CLIENT: Becky Kusabe  
COMPANY: Artural ... Tech  
ADDRESS: 23713 West Park Rd.  
Broussard, LA  
53072  
PHONE: \_\_\_\_\_  
DATE NEEDED: 8/10/AM

DATE: 8/9/AM  
REP: \_\_\_\_\_  
CO: N.T.  
REP. TELEPHONE: \_\_\_\_\_  
PROJECT: \_\_\_\_\_  
PROJ CITY/STATE: State Project

*see below*  
TRIP BLANK  YES  NO  
EQUIP/RINSATE BLANK  YES  NO  
FIELD BLANK  YES  NO  
D.I. WATER NEEDED  YES  NO  
SPECIAL COC: \_\_\_\_\_  
SPECIAL AB: \_\_\_\_\_

FEDEX:  PRIORITY - 1 DAY AM  
 STANDARD - 1 DAY PM  
 ECONOMY - 2ND DAY PM  
UPS:  PRIORITY - 1 DAY AM  
 STANDARD - GROUND  
SPL DELIVER:   
OTHER: \_\_\_\_\_

*if possible put all in 1 order and label 1/500.*

TYPE CONTAINER (SIZE, SHAPE)	AMT.	LID TYPE	PRESERVATIVE (NAME)	TYPE SAMPLE TEST
4oz milk (2oz)	10	T/3	HCL	GRD (H2O)
12 oz Brauner	10	T	HCL	DND (H2O)
4oz milk (2oz)	10	T/3	HCL	DESI (H2O)
12 oz Brauner	12	T/1	-	PAH (H2O)
500 ml glass	10	T	HNO3	Pb, Cd
12 oz Brauner (DI H2O)		T	HCL	Trichlor (H2O)
1oz 60 ml vial (DI H2O)		T	HCL	Trichlor (H2O)
1oz 60 ml vial (DI H2O)		T	HCL	Trichlor (H2O)
12 oz Brauner (DI H2O)		T	HCL	Trichlor (PAH)

INSTRUCTIONS FOR SAMPLER: 500ml (DI H2O) T HCL Trichlor (Pb, Cd)  
2 other containers as per MS and MSD. please  
fill all bottles

QUESTIONS? CALL SPRING MENDOZA, KAREN LESTELLE OR RON BENJAMIN AT (318) 237-4775

FILLED BY: Chad Comas COURIER: FedEx  
DATE/TIME: 8-9-95 12:30 FREIGHT #: 1165092143, 2134, 2152, 2161  
CHEST #: \_\_\_\_\_ AUTHORIZATION: 54.50 + 51.75 + 54.50 + 54.50  
= 215.25  
REQUESTED BY: BTB Coco (SPL) PAGE 1 OF 1



# SAMPLE BOTTLE REQUEST

9508804  
Pg 2 of 2

SPL, Inc.  
500 Ambassador Caffery Pkwy.  
Scott, LA 70583-8544  
Ph.: (318) 237-4775, Fax: 237-7080

**SHIP TO:**

CLIENT: Becky Koepke

DATE: 8/8/95

COMPANY: Natural Resource Technologies

REP: \_\_\_\_\_

ADDRESS: 23713 West Paul Rd.  
Lebanon, Wa.  
53072

CO: Natural Resource Tech

REP. TELEPHONE: \_\_\_\_\_

PHONE: \_\_\_\_\_

PROJECT: \_\_\_\_\_

DATE NEEDED: 8/10/pm

PROJ CITY/STATE: Citgo Project.

- \* see below TRIP BLANK (X) YES ( ) NO
- EQUIP/RINSATE BLANK ( ) YES ( ) NO
- FIELD BLANK ( ) YES ( ) NO
- D.I. WATER NEEDED ( ) YES ( ) NO
- SPECIAL COC: \_\_\_\_\_
- SPECIAL AB: \_\_\_\_\_

- FEDEX: ( ) PRIORITY - 1 DAY AM
- (X) STANDARD - 1 DAY PM
- ( ) ECONOMY - 2ND DAY PM
- UPS: ( ) PRIORITY - 1 DAY AM
- ( ) STANDARD - GROUND
- SPL DELIVER: ( )
- OTHER: \_\_\_\_\_

soils: if possible put all these in 1 cooler labeled soils.

TYPE CONTAINER (SIZE, SHAPE)	AMT.	LID TYPE	PRESERVATIVE (NAME)	TYPE SAMPLE TEST
<u>1-60 ml vial (prewashed)</u>	<u>9</u>	<u>T</u>	<u>-</u>	<u>GRO</u> } <u>3ci</u>
<u>1ea-40ml vial</u>	<u>9</u>	<u>T</u>	<u>25mls meth</u>	<u>for GRO ADDITION</u>
<u>1ea-60ml plain</u>	<u>9</u>	<u>T</u>	<u>-</u>	<u>DRO SOIL</u>
<u>4oz soil jar</u>	<u>9</u>	<u>T</u>	<u>-</u>	<u>VOC SOIL</u>
<u>4oz soil jar</u>	<u>9</u>	<u>T</u>	<u>-</u>	<u>PAH</u>
<u>4oz soil jar</u>	<u>9</u>	<u>T</u>	<u>-</u>	<u>Pb, Cd.</u>
<u>500 ml glass (DI H<sub>2</sub>O)</u>	<u>1/ chest</u>	<u>-</u>	<u><del>HNO<sub>3</sub></del> HNO<sub>3</sub> (CC)</u>	<u>Pb, Cd.</u>
<u>1ea 60 ml vial (DI H<sub>2</sub>O)</u>	<u>1 set/ chest</u>	<u>-</u>	<u>(HCl) trip blank</u>	<u>GRO/PVC</u>
<u>1L BR amber (DI H<sub>2</sub>O)</u>	<u>1ea/ chest</u>	<u>-</u>	<u>(HCl) trip blank</u>	<u>DRO</u>

INSTRUCTIONS FOR SAMPLER:  
Lab has 18 HRS. to add solvent to DRO vial after receipt of sampler. Please notify lab when sampler arrives to be shipped.

QUESTIONS? CALL SPRING MENDOZA, KAREN LESTELLE OR RON BENJAMIN AT (318) 237-4775

1ea 60 ml vial (DI H<sub>2</sub>O) 1/ chest +1cl Trip Blank VOC

1L BR Amber 1/ chest HCl Trip Blank PAH

FILLED BY: Renee Cantelmo COURIER: 1 chest

DATE/TIME: 8-9-95/ 11:50 FREIGHT #: 116 5082 134

CHEST #: 1 chest AUTHORIZATION: \_\_\_\_\_

TRACKING #	WGT	SVC	GRS	CHG	NAME	COMPANY	REFERENCES	CITY	ST	ZIP
1165082107	27	SO	47.25		BECKY KOEPKE	NATURAL RESOURCE TECH.	CITGO CC	PEWAUKE	WI	53072
1165082116	14	SO	33.75		BECKY KOEPKE	NATURAL RESOURCE TECHNO	CITGO CC	PEWAUKE	WI	53072
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
1165082134	30	SO	51.75		BECKY KOEPHE	NATURAL RESOURCE TECHNO	CITGO PROJECT KM	PEWAUKE	WI	53072
1165082143	32	SO	54.50		BECKY KOEPKE	NATURAL RESOURCE TECH.	CITGO PROJECT CC	PEWAUKE	WI	53072
1165082152	32	SO	54.50		BECKY KOEPKE	NATURAL RESOURCE TECH.	CITGO PROJECT CC	PEWAUKE	WI	53072
1165082161	32	SO	54.50		BECKY KOEPKE	NATURAL RESOURCE TECH.	CITGO PROJECT CC	PEWAUKE	WI	53072

INVOICE - 931768959 -

9508804

1165082107

1165082116

1165082134

1165082143

1165082152

1165082161





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-01

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: SB-103 (3.5)

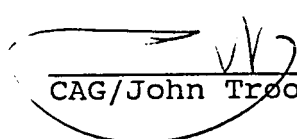
PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/18/95 15:15:00  
 DATE RECEIVED: 08/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/23/95 12:02:00	130	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/28/95 11:46:00	120	14	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/25/95 09:02:00	37	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	81.3	0.1	Weight %

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-01

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: SB-103 (3.5)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/18/95 15:15:00  
DATE RECEIVED: 08/19/95

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	14.5	µg/Kg
Chloromethane	ND	4.0	µg/Kg
Vinyl chloride	ND	9.0	µg/Kg
Chloroethane	ND	26.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	6.5	µg/Kg
Methylene Chloride	B 10	4.0	µg/Kg
trans-1,2-Dichloroethene	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	3.5	µg/Kg
2,2-Dichloropropane	ND	2.5	µg/Kg
cis-1,2-Dichloroethene	ND	0.5	µg/Kg
Chloroform	ND	2.5	µg/Kg
1,1,1-Trichloroethane	ND	1.5	µg/Kg
Carbon Tetrachloride	ND	6.0	µg/Kg
Benzene	170	10.0	µg/Kg
1,2-Dichloroethane	ND	1.5	µg/Kg
Trichloroethene	ND	6.0	µg/Kg
1,2-Dichloropropane	ND	2.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Toluene	64	10.0	µg/Kg
1,1,2-Trichloroethane	ND	1.0	µg/Kg
Tetrachloroethene	ND	1.5	µg/Kg
1,3-Dichloropropane	ND	1.5	µg/Kg
Dibromochloromethane	ND	4.5	µg/Kg
1,2-Dibromoethane	ND	4.0	µg/Kg
Chlorobenzene	ND	12.5	µg/Kg
Ethyl benzene	490	10.0	µg/Kg
M and P Xylene	1600	10.0	µg/Kg
O-Xylene	83	10.0	µg/Kg
Isopropylbenzene	110	10.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	µg/Kg
n-Propyl benzene	ND	0.5	µg/Kg
Bromobenzene	ND	1.5	µg/Kg
1,3,5-Trimethylbenzene	950	1.0	µg/Kg
2-Chlorotoluene	ND	0.5	µg/Kg
4-Chlorotoluene	ND	1.0	µg/Kg
tert-Butylbenzene	ND	3.0	µg/Kg
1,2,4-Trimethylbenzene	2200	2.5	µg/Kg

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-01

CITGO PETROLEUM CORPORATION

SAMPLE ID: SB-103 (3.5)

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	PQL*	
sec-Butylbenzene	430	1.0	µg/Kg
p-Isopropyltoluene	ND	0.5	µg/Kg
1,3-Dichlorobenzene	ND	16.0	µg/Kg
1,4-Dichlorobenzene	ND	12.0	µg/Kg
n-Butylbenzene	620	1.0	µg/Kg
1,2-Dichlorobenzene	ND	7.5	µg/Kg
1,2-Dibromo-3-chloropropane	ND	150	µg/Kg
1,2,4-Trichlorobenzene	ND	1.5	µg/Kg
Hexachlorobutadiene	ND	1.0	µg/Kg
Naphthalene	ND	3.0	µg/Kg
1,2,3-Trichlorobenzene	ND	1.0	µg/Kg
Di-isopropyl ether	ND	5.0	µg/Kg
Methyl-t-butyl ether	ND	40.0	µg/Kg
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene	114		

ANALYZED BY: PW

DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

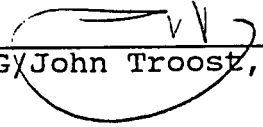
NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

**QUALITY ASSURANCE:** Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager







LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-02

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 09/01/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-112 (3.5)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/18/95 16:10:00  
 DATE RECEIVED: 08/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Naphthalene	510	3.00	µg/Kg
Acenaphthylene	ND	3.00	µg/Kg
Acenaphthene	ND	3.00	µg/Kg
Fluorene	ND	3.50	µg/Kg
Phenanthrene	ND	3.00	µg/Kg
Anthracene	ND	2.00	µg/Kg
Fluoranthene	ND	2.50	µg/Kg
Pyrene	ND	2.00	µg/Kg
Chrysene	ND	1.00	µg/Kg
Benzo (a) anthracene	ND	0.50	µg/Kg
Benzo (b) fluoranthene	23	0.50	µg/Kg
Benzo (k) fluoranthene	9	1.00	µg/Kg
Benzo (a) pyrene	11	1.50	µg/Kg
Dibenzo (a,h) anthracene	ND	1.00	µg/Kg
Benzo (g,h,i) perylene	ND	1.50	µg/Kg
Indeno (1,2,3-cd) pyrene	ND	1.00	µg/Kg
1-Methylnaphthalene	580	3.00	µg/Kg
2-Methylnaphthalene	980	3.00	µg/Kg

SURROGATES

9,10-Diphenylanthracene

% RECOVERY

+ DO

ANALYZED BY: SJ DATE/TIME: 08/24/95 16:24:00  
 EXTRACTED BY: BD DATE/TIME: 08/23/95 11:00:00  
 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
 NOTES: \* - Practical Quantitation Limit ND - Not Detected  
 NA - Not Analyzed

COMMENTS: + DO = Surrogate diluted out.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-03

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 08/31/95


PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: SB-102 (3.5)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/18/95 14:40:00  
DATE RECEIVED: 08/19/95

PARAMETER	ANALYTICAL DATA	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/23/95 12:02:00		24	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/28/95 10:59:00		11	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00		08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/25/95 09:02:00		23	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00		85.5	0.1	Weight %

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-03

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: SB-102 (3.5)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/18/95 14:40:00  
DATE RECEIVED: 08/19/95

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	14.5	µg/Kg
Chloromethane	ND	4.0	µg/Kg
Vinyl chloride	ND	9.0	µg/Kg
Chloroethane	ND	26.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	6.5	µg/Kg
Methylene Chloride	B 8	4.0	µg/Kg
trans-1,2-Dichloroethene	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	3.5	µg/Kg
2,2-Dichloropropane	ND	2.5	µg/Kg
cis-1,2-Dichloroethene	ND	0.5	µg/Kg
Chloroform	ND	2.5	µg/Kg
1,1,1-Trichloroethane	ND	1.5	µg/Kg
Carbon Tetrachloride	ND	6.0	µg/Kg
Benzene	110	10.0	µg/Kg
1,2-Dichloroethane	ND	1.5	µg/Kg
Trichloroethene	ND	6.0	µg/Kg
1,2-Dichloropropane	ND	2.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Toluene	ND	10.0	µg/Kg
1,1,2-Trichloroethane	ND	1.0	µg/Kg
Tetrachloroethene	ND	1.5	µg/Kg
1,3-Dichloropropane	ND	1.5	µg/Kg
Dibromochloromethane	ND	4.5	µg/Kg
1,2-Dibromoethane	ND	4.0	µg/Kg
Chlorobenzene	ND	12.5	µg/Kg
Ethyl benzene	ND	10.0	µg/Kg
M and P Xylene	ND	10.0	µg/Kg
O-Xylene	ND	10.0	µg/Kg
Isopropylbenzene	ND	10.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	µg/Kg
n-Propyl benzene	ND	0.5	µg/Kg
Bromobenzene	ND	1.5	µg/Kg
1,3,5-Trimethylbenzene	ND	1.0	µg/Kg
2-Chlorotoluene	ND	0.5	µg/Kg
4-Chlorotoluene	ND	1.0	µg/Kg
tert-Butylbenzene	ND	3.0	µg/Kg
1,2,4-Trimethylbenzene	ND	2.5	µg/Kg

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)





LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-03

CITGO PETROLEUM CORPORATION

SAMPLE ID: SB-102 (3.5)

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	PQL*	
sec-Butylbenzene	ND	1.0	µg/Kg
p-Isopropyltoluene	ND	0.5	µg/Kg
1,3-Dichlorobenzene	ND	16.0	µg/Kg
1,4-Dichlorobenzene	ND	12.0	µg/Kg
n-Butylbenzene	ND	1.0	µg/Kg
1,2-Dichlorobenzene	ND	7.5	µg/Kg
1,2-Dibromo-3-chloropropane	ND	150	µg/Kg
1,2,4-Trichlorobenzene	ND	1.5	µg/Kg
Hexachlorobutadiene	ND	1.0	µg/Kg
Naphthalene	ND	3.0	µg/Kg
1,2,3-Trichlorobenzene	ND	1.0	µg/Kg
Di-isopropyl ether	ND	5.0	µg/Kg
Methyl-t-butyl ether	ND	40.0	µg/Kg
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene		109	

ANALYZED BY: PW

DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]

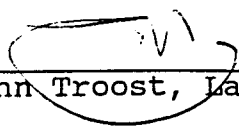
NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-04

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-104 (3.5)

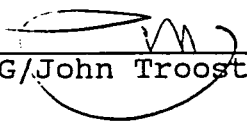
PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/18/95 11:15:00  
 DATE RECEIVED: 08/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/23/95 12:02:00	14	5	mg/Kg
Total Petroleum Hydrocarbons (DRO) WI LUST DRO # Analyzed by: AH Date: 08/26/95 08:01:00	6.3	2.9	mg/Kg
Sonication extraction METHOD 3550 *** Analyzed by: BD Date: 08/23/95 11:00:00	08/23/95		
Lead, Total Method 7420 *** Analyzed by: EH Date: 08/25/95 09:02:00	35	10	mg/Kg
Total Solids Method 2540G ** Analyzed by: DB Date: 08/29/95 16:00:00	86.3	0.1	Weight %

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



Certificate of Analysis No. L1-9508822-04

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
08/31/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-104 (3.5)

PROJECT NO: 1096  
MATRIX: SOIL  
DATE SAMPLED: 08/18/95 11:15:00  
DATE RECEIVED: 08/19/95

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	14.5	µg/Kg
Chloromethane	ND	4.0	µg/Kg
Vinyl chloride	ND	9.0	µg/Kg
Chloroethane	ND	26.0	µg/Kg
Trichlorofluoromethane	ND	5.0	µg/Kg
1,1-Dichloroethene	ND	6.5	µg/Kg
Methylene Chloride	B 9	4.0	µg/Kg
trans-1,2-Dichloroethene	ND	5.0	µg/Kg
1,1-Dichloroethane	ND	3.5	µg/Kg
2,2-Dichloropropane	ND	2.5	µg/Kg
cis-1,2-Dichloroethene	ND	0.5	µg/Kg
Chloroform	ND	2.5	µg/Kg
1,1,1-Trichloroethane	ND	1.5	µg/Kg
Carbon Tetrachloride	ND	6.0	µg/Kg
Benzene	ND	10.0	µg/Kg
1,2-Dichloroethane	ND	1.5	µg/Kg
Trichloroethene	ND	6.0	µg/Kg
1,2-Dichloropropane	ND	2.0	µg/Kg
Bromodichloromethane	ND	5.0	µg/Kg
Toluene	ND	10.0	µg/Kg
1,1,2-Trichloroethane	ND	1.0	µg/Kg
Tetrachloroethene	ND	1.5	µg/Kg
1,3-Dichloropropane	ND	1.5	µg/Kg
Dibromochloromethane	ND	4.5	µg/Kg
1,2-Dibromoethane	ND	4.0	µg/Kg
Chlorobenzene	ND	12.5	µg/Kg
Ethyl benzene	ND	10.0	µg/Kg
M and P Xylene	ND	10.0	µg/Kg
O-Xylene	ND	10.0	µg/Kg
Isopropylbenzene	ND	10.0	µg/Kg
1,1,2,2-Tetrachloroethane	ND	1.5	µg/Kg
n-Propyl benzene	ND	0.5	µg/Kg
Bromobenzene	ND	1.5	µg/Kg
1,3,5-Trimethylbenzene	ND	1.0	µg/Kg
2-Chlorotoluene	ND	0.5	µg/Kg
4-Chlorotoluene	ND	1.0	µg/Kg
tert-Butylbenzene	ND	3.0	µg/Kg
1,2,4-Trimethylbenzene	ND	2.5	µg/Kg

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508822-04

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-104 (3.5)

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	PQL*	
sec-Butylbenzene	ND	1.0	µg/Kg
p-Isopropyltoluene	ND	0.5	µg/Kg
1,3-Dichlorobenzene	ND	16.0	µg/Kg
1,4-Dichlorobenzene	ND	12.0	µg/Kg
n-Butylbenzene	ND	1.0	µg/Kg
1,2-Dichlorobenzene	ND	7.5	µg/Kg
1,2-Dibromo-3-chloropropane	ND	150	µg/Kg
1,2,4-Trichlorobenzene	ND	1.5	µg/Kg
Hexachlorobutadiene	ND	1.0	µg/Kg
Naphthalene	ND	3.0	µg/Kg
1,2,3-Trichlorobenzene	ND	1.0	µg/Kg
Di-isopropyl ether	ND	5.0	µg/Kg
Methyl-t-butyl ether	ND	40.0	µg/Kg
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene		109	

ANALYZED BY: PW

DATE/TIME: 08/29/95 17:27:00

METHOD: Mod. 8021 (VOC) [SW 846]


NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 Method 8020 \*\*\*

PAGE

Matrix: Soil  
 Units: µg/Kg

Batch Id: HPBB950824101801

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
MTBE	ND	50	48.8121	97.6	39 - 150
BENZENE	ND	50	58.4050	117	39 - 150
TOLUENE	ND	50	48.2588	96.5	46 - 140
ETHYL_BENZENE	ND	50	48.5536	97.1	32 - 160
1,3,5-TMB	ND	50	48.6548	97.3	32 - 160
1,2,4-TMB	ND	50	49.8930	99.8	32 - 160
O XYLENE	ND	50	49.7405	99.5	32 - 160
M AND P XYLENE	ND	50	50.7634	102	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
MTBE	ND	50	41.8043	83.6	48.6078	97.2	15.0	20	39 - 150
BENZENE	ND	50	44.3077	88.6	46.0409	92.1	3.87	20	39 - 150
TOLUENE	ND	50	44.5657	89.1	46.1086	92.2	3.42	20	46 - 140
ETHYL_BENZENE	ND	50	41.9588	83.9	43.3941	86.8	3.40	20	32 - 160
1,3,5-TMB	ND	50	39.4697	78.9	41.8853	83.8	6.02	20	32 - 160
1,2,4-TMB	13.3583	50	43.3686	60.0	46.7033	66.7	10.6	20	32 - 160
O XYLENE	ND	50	41.8723	83.7	44.0112	88.0	5.01	20	32 - 160
M AND P XYLENE	ND	100	81.7776	81.8	84.4071	84.4	3.13	20	32 - 160

Analyst: TB

Sequence Date: 08/24/95

SPL ID of sample spiked: 9508896-01A

Sample File ID: \BH24415.ra

Method Blank File ID:

Blank Spike File ID: \BH24404.ra

Matrix Spike File ID: \BH24429.ra

Matrix Spike Duplicate File ID: \BH24430.ra

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [( <1> - <2> ) / <3> ] x 100

LCS % Recovery = ( <1> / <3> ) x 100

Relative Percent Difference = [ ( <4> - <5> ) / [ ( <4> + <5> ) x 0.5 ] ] x 100

(\*\*) = Source:

(\*\*\*) = Source:

SAMPLES IN BATCH(SPL ID):

9508822-02A

*Karen Grizzaffi*  
 Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 EPA 8310

PAGE

Matrix: Soil  
 Units: µg/Kg

Batch Id: HPLC950824162400

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Naphthalene	ND	3.30	2.72	82.4	30 - 122
Acenaphthylene	ND	3.30	2.94	89.1	30 - 126
Acenaphthene	ND	3.30	2.81	85.2	30 - 124
Fluorene	ND	3.30	3.15	95.5	30 - 142
Phenanthrene	ND	3.30	2.85	86.4	30 - 155
Anthracene	ND	3.30	1.98	60.0	30 - 126
Fluoranthene	ND	3.30	2.62	79.4	30 - 123
Pyrene	ND	3.30	2.80	84.8	30 - 140
Chrysene	ND	3.30	2.81	85.2	30 - 199
Benzo (a) anthracene	ND	3.30	2.83	85.8	30 - 135
Benzo (b) fluoranthene	ND	3.30	2.70	81.8	30 - 150
Benzo (k) fluoranthene	ND	3.30	2.70	81.8	30 - 159
Benzo (a) pyrene	ND	3.30	2.47	74.8	30 - 128
Dibenzo (a,h) anthracene	ND	3.30	2.64	80.0	30 - 110
Benzo (g,h,i) perylene	ND	3.30	2.81	85.2	30 - 116
Indeno (1,2,3-cd) pyrene	ND	3.30	2.59	78.5	30 - 116
1-Methylnaphthalene	ND	3.30	2.81	85.2	30 - 130
2-Methylnaphthalene	ND	3.30	3.15	95.5	30 - 130

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
NAPHTHALENE	3.5	3.30	4.91	42.7	4.11	18.5 *	79.1 *	30	30 - 122
ACENAPHTHYLENE	ND	3.30	2.43	73.6	2.82	85.5	15.0	30	30 - 126
ACENAPHTHENE	ND	3.30	2.94	89.1	2.56	77.6	13.8	30	30 - 124
FLUORENE	ND	3.30	2.28	69.1	2.13	64.5	6.89	30	30 - 142
PHENANTHRENE	ND	3.30	3.20	97.0	2.74	83.0	15.6	30	30 - 155
ANTHRACENE	ND	3.30	2.12	64.2	2.03	61.5	4.30	30	30 - 126
FLUORANTHENE	ND	3.30	2.80	84.8	2.15	65.2	26.1	30	30 - 123
PYRENE	ND	3.30	3.20	97.0	3.12	94.5	2.61	30	30 - 140
CHRYSENE	0.5	3.30	3.93	104	2.46	59.4	54.6 *	30	30 - 199
BENZO (A) ANTHRACENE	ND	3.30	2.84	86.1	2.47	74.8	14.0	30	30 - 135
BENZO (B) FLUORANTHENE	ND	3.30	3.84	116	3.63	110	5.31	30	30 - 150
BENZO (K) FLUORANTHENE	ND	3.30	2.90	87.9	2.35	71.2	21.0	30	30 - 159
BENZO (A) PYRENE	ND	3.30	2.45	74.2	2.81	85.2	13.8	30	30 - 128
DIBENZO (A,H) ANTHRACENE	ND	3.30	2.76	83.6	2.30	69.7	18.1	30	30 - 130
BENZO (G,H,I) PERYLENE	ND	3.30	3.22	97.6	2.45	74.2	27.2	30	30 - 130
INDENO (1,2,3-CD) PYRENE	ND	3.30	2.40	72.7	2.10	63.6	13.4	30	30 - 116

*Karen Grizzaffi*  
 Karen Grizzaffi, QC Officer





\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
EPA 8310

LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775  
PAGE 0

Matrix: Soil  
Units: µg/Kg

Batch Id: HPLC950824162400

M A T R I X   S P I K E S

S P I K E C O M P O U N D S	Sample Results  <2>	Spike Added  <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result	Recovery	Result	Recovery		RPD Max.	Recovery Range
			<1>	<4>	<1>	<5>			
1-METHYLNAPHTHALENE	ND	3.30	3.86	117	3.24	98.2	17.5	30	30 - 130
2-METHYLNAPHTHALENE	ND	3.30	4.20	127	3.80	115	9.92	30	30 - 130

Analyst: SJ

Sequence Date: 08/24/95

SPL ID of sample spiked: 9508814-05A

Sample File ID: 9508240120101

Method Blank File ID:

Blank Spike File ID: 9508250160101

Matrix Spike File ID: 9508250170101

Matrix Spike Duplicate File ID: 9508290030101

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery =  $[( <1> - <2> ) / <3> ] \times 100$

LCS % Recovery =  $( <1> / <3> ) \times 100$

Relative Percent Difference =  $|( <4> - <5> | / [( <4> + <5> ) \times 0.5] \times 100$

(\*\*) = Source: 8310 SW846

(\*\*\*) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508814-04A 9508814-05A 9508822-01C 9508822-02B  
9508822-03C 9508822-04C 9508804-01C 9508804-02C  
9508804-03C 9508804-04C 9508814-01A 9508814-02A  
9508814-03A

Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method Mod. 8021 \*\*\*

PAGE

Matrix: Soil  
Units: µg/Kg

Batch Id: HP00950829172700

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
DICHLORODIFLUOROMETHANE	ND	15.0	10.1588	67.7	50 - 140
CHLOROMETHANE	ND	15.0	11.9650	79.8	50 - 140
VINYL CHLORIDE	ND	15.0	14.1999	94.7	50 - 140
BROMOMETHANE	ND	15.0	14.0690	93.8	50 - 140
CHLOROETHANE	ND	15.0	13.8967	92.6	50 - 140
TRICHLOROFLUOROMETHANE	ND	15.0	13.3424	88.9	50 - 140
1,1-DICHLOROETHENE	ND	15.0	14.0249	93.5	50 - 140
METHYLENE CHLORIDE	8.7282	15.0	14.3194	95.5	50 - 140
TRANS-1,2-DICHLOROETHENE	ND	15.0	14.3523	95.7	50 - 140
1,1-DICHLOROETHANE	ND	15.0	15.6520	104	50 - 140
2,2-DICHLOROPROPANE	ND	15.0	15.6170	104	50 - 140
CIS-1,2-DICHLOROETHENE	ND	15.0	16.6364	111	50 - 140
CHLOROFORM	ND	15.0	16.1993	108	50 - 140
BROMOCHLOROMETHANE	ND	15.0	13.2430	88.3	50 - 140
1,1,1-TRICHLOROETHANE	ND	15.0	13.9952	93.3	50 - 140
1,1-DICHLOROPROPENE	ND	15.0	13.8919	92.6	50 - 140
CARBON TETRACHLORIDE	ND	15.0	14.2044	94.7	50 - 140
BENZENE	ND	15.0	14.7653	98.4	50 - 140
1,2-DICHLOROETHANE	ND	15.0	13.6859	91.2	50 - 140
TRICHLOROETHENE	ND	15.0	14.0374	93.6	50 - 140
1,2-DICHLOROPROPANE	ND	15.0	14.0022	93.3	50 - 140
BROMODICHLOROMETHANE	ND	15.0	14.1002	94.0	50 - 140
DIBROMOMETHANE	ND	15.0	10.5000	70.0	50 - 140
CIS-1,3-DICHLOROPROPENE	ND	15.0	13.8845	92.6	50 - 140
TOLUENE	ND	15.0	14.8498	99.0	50 - 140
TRANS-1,3-DICHLOROPROPENE	ND	15.0	13.6615	91.1	50 - 140
1,1,2-TRICHLOROETHANE	ND	15.0	14.2644	95.1	50 - 140
TETRACHLOROETHENE	ND	15.0	14.2262	94.8	50 - 140
1,3-DICHLOROPROPANE	ND	15.0	13.2212	88.1	50 - 140
DIBROMOCHLOROMETHANE	ND	15.0	14.6579	97.7	50 - 140
1,2-DIBROMOETHANE	ND	15.0	13.8998	92.7	50 - 140
CHLOROBENZENE	ND	15.0	14.0715	93.8	50 - 140
ETHYL BENZENE	ND	15.0	15.1737	101	50 - 140
1,1,1,2-TETRACHLOROETHANE	ND	15.0	14.0873	93.9	50 - 140
M AND P XYLENE	ND	30.0	29.0101	96.7	50 - 140
O-XYLENE	ND	15.0	14.8202	98.8	50 - 140
STYRENE	ND	15.0	14.1552	94.4	50 - 140
ISOPROPYLBENZENE	ND	15.0	13.4352	89.6	50 - 140
BROMOFORM	ND	15.0	15.4367	103	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND	15.0	13.8460	92.3	50 - 140
1,2,3-TRICHLOROPROPANE	ND	15.0	16.4965	110	50 - 140
N-PROPYL BENZENE	ND	15.0	16.5424	110	50 - 140

*Karen Grizzaffi*  
Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method Mod. 8021 \*\*\*

Matrix: Soil  
Units: µg/Kg

Batch Id: HPO0950829172700

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
BROMOBENZENE	ND	15.0	15.8126	105	50 - 140
1,3,5-TRIMETHYLBENZENE	ND	15.0	18.0975	121	50 - 140
2-CHLOROTOLUENE	ND	15.0	15.5191	103	50 - 140
4-CHLOROTOLUENE	ND	15.0	16.1557	108	50 - 140
TERT-BUTYLBENZENE	ND	15.0	16.3752	109	50 - 140
1,2,4-TRIMETHYLBENZENE	ND	15.0	13.5072	90.0	50 - 140
SEC-BUTYLBENZENE	ND	15.0	13.4839	89.9	50 - 140
P-ISOPROPYLTOLUENE	ND	15.0	13.4162	89.4	50 - 140
1,3-DICHLOROBENZENE	ND	15.0	13.5831	90.6	50 - 140
1,4-DICHLOROBENZENE	ND	15.0	12.7529	85.0	50 - 140
N-BUTYLBENZENE	ND	15.0	14.2348	94.9	50 - 140
1,2-DICHLOROBENZENE	ND	15.0	14.5364	96.9	50 - 140
1,2-DIBROMO-3-CHLOROPROPAN	ND	15.0	20.1710	134	50 - 140
1,2,4-TRICHLOROBENZENE	ND	15.0	20.4816	137	50 - 140
HEXACHLOROBUTADIENE	ND	15.0	17.6380	118	50 - 140
NAPHTHALENE	ND	15.0	20.1513	134	50 - 140
1,2,3-TRICHLOROBENZENE	ND	15.0	12.9749	86.5	50 - 140

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
VINYL CHLORIDE	ND	25.0	26.8906	108	22.0159	88.1	20.3	30	50 - 140
CHLOROETHANE	ND	25.0	14.8107	59.2	22.7840	91.1	42.4 *	30	50 - 140
METHYLENE CHLORIDE	8.7282	25.0	27.7291	76.0	30.8540	88.5	15.2	30	50 - 140
1,1-DICHLOROETHANE	ND	25.0	18.1752	72.7	22.2111	88.8	19.9	30	50 - 140
CHLOROFORM	ND	25.0	19.0732	76.3	25.7030	103	29.8	30	50 - 140
1,1,1-TRICHLOROETHANE	ND	25.0	24.5692	98.3	29.4020	118	18.2	30	50 - 140
CARBON TETRACHLORIDE	ND	25.0	28.9150	116	30.8402	123	5.86	30	50 - 140
BENZENE	ND	25.0	27.6560	111	25.0683	100	10.4	30	50 - 140
1,2-DICHLOROETHANE	ND	25.0	25.0978	100	22.7409	91.0	9.42	30	50 - 140
TRICHLOROETHENE	ND	25.0	30.7148	123	31.6990	127	3.20	30	50 - 140
BROMODICHLOROMETHANE	ND	25.0	27.4625	110	28.2521	113	2.69	30	50 - 140
TOLUENE	ND	25.0	27.3918	110	25.3227	101	8.53	30	50 - 140
1,1,2-TRICHLOROETHANE	ND	25.0	23.5156	94.1	21.8858	87.5	7.27	30	50 - 140
TETRACHLOROETHENE	ND	25.0	29.9327	120	31.7590	127	5.67	30	50 - 140
CHLOROBENZENE	ND	25.0	25.8011	103	25.4625	102	0.976	30	50 - 140
ETHYL BENZENE	ND	25.0	25.4383	102	23.5165	94.1	8.06	30	50 - 140
M AND P XYLENE	ND	50.0	49.000	98.0	48.6036	97.2	0.820	30	50 - 140

*Karen Grizzaffi*  
Karen Grizzaffi, QC Officer



**\*\* SPL BATCH QUALITY CONTROL REPORT \*\***  
 Method Mod. 8021 \*\*\*

Matrix: Soil  
 Units: µg/Kg

Batch Id: HP00950829172700

M A T R I X   S P I K E S

S P I K E C O M P O U N D S	Sample Results  <2>	Spike Added  <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result	Recovery	Result	Recovery		RPD Max.	Recovery Range
			<1>	<4>	<1>	<5>			
O-XYLENE	ND	25.0	25.0766	100	25.0744	100	0	30	50 - 140
ISOPROPYLBENZENE	ND	25.0	24.2426	97.0	25.1598	101	4.04	30	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND	25.0	20.6120	82.4	20.7195	82.9	0.605	30	50 - 140
SEC-BUTYLBENZENE	ND	25.0	23.5101	94.0	25.4000	102	8.16	30	50 - 140
P-ISOPROPYLTOLUENE	ND	25.0	20.4315	81.7	25.0284	100	20.1	30	50 - 140
1,3-DICHLOROBENZENE	ND	25.0	22.3167	89.3	23.9584	95.8	7.02	30	50 - 140
1,4-DICHLOROBENZENE	ND	25.0	19.2137	76.9	24.8694	99.5	25.6	30	50 - 140
N-BUTYLBENZENE	ND	25.0	22.9546	91.8	22.2006	88.8	3.32	30	50 - 140
1,2-DICHLOROBENZENE	ND	25.0	19.8557	79.4	22.5870	90.3	12.8	30	50 - 140
NAPHTHALENE	ND	25.0	20.2	80.8	16.8222	67.3	18.2	30	50 - 140

Analyst: PW

Sequence Date: 08/29/95

SPL ID of sample spiked: MBLANK

Sample File ID: \EH29202.ra

Method Blank File ID:

Blank Spike File ID: \EH29204.ra

Matrix Spike File ID: \EH29214.ra

Matrix Spike Duplicate File ID: \EH29204.ra

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [( <1> - <2> ) / <3> ] x 100

LCS % Recovery = ( <1> / <3> ) x 100

Relative Percent Difference = [ ( <4> - <5> ) / [ ( <4> + <5> ) x 0.5 ] ] x 100

(\*\*) = Source: SPL Lafayette, 11/94

(\*\*\*) = Source: SPL Lafayette, 11/94

SAMPLES IN BATCH(SPL ID):

9508822-01A 9508822-03A 9508822-04A 9508804-01A  
 9508804-02A 9508804-03A 9508804-04A 9508822-01A

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/26/95

Analyst: AH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Diesel Range Organics  
WI LUST DRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
BLANK_SPIKE	8.0	40	82.5	85.0	3.0	50 - 130	30

TPHD950821100000-9508D89

Samples in batch:

9508804-01B 9508804-02B 9508804-03B 9508804-04B  
9508822-01B 9508822-03B 9508822-04B

COMMENTS:

METHOD BLANK CONTRIBUTION OF LESS THAN 5 TIMES OF THE DETECTION LIMIT. UNABLE TO REEXTRACT DUE TO NO MORE SAMPLE AVAILABLE.

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/25/95

Analyzed on: 08/23/95

Analyst: TB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Gasoline Range Organics  
WI LUST GRO #

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508821-04A	ND	5.0	82.0	72.0	13	60 - 130	20

FIDB950823120200-9508B11

Samples in batch:

9508822-01A 9508822-02A 9508822-03A

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/25/95

Analyzed on: 08/25/95

Analyst: EH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total  
Method 7420 \*\*\*

SPL Sample ID Number	Blank Value mg/Kg	Amt Added mg/Kg	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508822-01D	ND	100	100	90.0	10	80 - 120	20

3100950825090200-9508824

Samples in batch:

9508822-01D 9508822-03D 9508822-04D

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/30/95

Analyzed on: 08/29/95

Analyst: DB

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Solids  
 Method 2540G \*\*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration %	Duplicate Sample %	RPD	RPD Max.
9508841-18A	88.3	88.3	0	20

TSOL950829160000-9508E21

Samples in batch:

9508804-01D 9508804-02D 9508804-03D 9508804-04D  
 9508822-01D 9508822-02D 9508822-03D 9508822-04D  
 9508841-09A 9508841-10A 9508841-11A 9508841-12A  
 9508841-13A 9508841-14A 9508841-15A 9508841-16A  
 9508841-17A 9508841-18A

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer





### SAMPLE PROTOCOL NON-CONFORMANCE LOG

Prepared by: Kenneth Constantine

Date 8/19/95

Client: Natural Resource Tech.

Work Order \_\_\_\_\_

Sample Types: Soil Water Sludge \_\_\_\_\_ Product \_\_\_\_\_ Air \_\_\_\_\_

#### SAMPLES AFFECTED

Client ID	Fraction #	ALL
1	<u>Didn't received methanol BLK</u>	
2		
3		
4		
5		

#### NON-CONFORMANCE

HEAD SPACE IN VOA      UNPRESERVED      IMPROPERLY PRESERVED

IMPROPER CONTAINERS      DAMAGED CONTAINERS      NO COC PRESENT

SAMPLE/COC I.D CONFLICT      INCOMPLETE COC

OTHER: \_\_\_\_\_

Submitted for Resolution to: \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_

Client's Instructions: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Returned to Login: Date: \_\_\_\_\_ Time: \_\_\_\_\_

ACTION: STOP ANALYSES    COMPLETE LOGIN    HOLD UNTIL \_\_\_\_\_

Instructions: \_\_\_\_\_

\_\_\_\_\_



LAFAYETTE LAB  
 P.O. BOX 31780  
 LAFAYETTE, LA  
 ZIP 70593-1780  
 PHONE: (318) 984 23

PL CHEST # ✓

ENVIRONMENTAL LABORATORY

DATE 8/19/95

CLIENT CHEST: YES/NO

SAMPLE LOGIN CHECKLIST

	YES	NO
1) IS A CHAIN-OF CUSTODY FORM PRESENT:	<u>✓</u>	_____
2) IS THE COC PROPERLY COMPLETED:	<u>✓</u>	_____
IF NO, DESCRIBE WHAT IS INCOMPLETE:	_____	_____

3) HAS CLIENT BEEN CONTACTED ABOUT INCOMPLETE COC:	_____	_____
4) IS AIRBILL/PACKING LIST/BILL OF LADING ATTACHED TO SHIPMENT:	<u>✓</u>	_____
IF YES, ID# <u>Fed-x 6494484474</u>	_____	_____
5) ARE CUSTODY SEALS PRESENT ON THE PACKAGE:	<u>✓</u>	_____
IF YES, ARE THEY INTACT UPON RECEIPT:	_____	_____
6) ARE ALL SAMPLES TAGGED OR LABELED:	<u>✓</u>	_____
DO THE LABELS MATCH THE COC:	<u>✓</u>	_____
IF NO, HAS CLIENT BEEN CONTACTED ABOUT IT:	_____	_____
(PLACE SUBSEQUENT DOCUMENTATION FROM CLIENT IN REMARKS)	_____	_____

7) DO ALL SHIPPING DOCUMENTS AGREE:	<u>✓</u>	_____
IF NO, DESCRIBE WHAT IS IN NONCONFORMITY:	_____	_____

8) CONDITION/TEMPERATURE OF SHIPPING CONTAINER:	_____	_____
<u>OK - 4C</u>	<u>56-3</u>	<u>w-5</u>

9) CONDITION OF SAMPLE CONTAINERS:	_____	<u>#9</u>
<u>Didn't receive methanol BLK.</u>		<u>3w</u>

10) SAMPLE DISPOSAL: SPL L RETURN TO CLIENT \_\_\_\_\_  
 REMARKS/CONTACT/PHONE/DATE: \_\_\_\_\_

**FREIGHT**

CO.: Natural Resource REPTS TO: \_\_\_\_\_ INV. TO: \_\_\_\_\_

ROJ #: 1096 ATTN: \_\_\_\_\_ ATTN: \_\_\_\_\_

PROJ LOC.: WI ADDR: \_\_\_\_\_ ADDR: \_\_\_\_\_

SPL REP.: K. C. CTY/ST \_\_\_\_\_ CTY/ST \_\_\_\_\_

15088.22

CHAIN OF CUSTODY RECORD

Sample Collectors(s)/Signature(s): REBECCA T. KOEPE / BECUM / OYLE  
 Laboratory Samples are Being Submitted To: ~~TRC~~ SPL  
 Quote Number/Addendum Number \_\_\_\_\_ Attached: YES \_\_\_ NO \_\_\_

Site Name: CITGO FERM Send Report To: L.M. MUELLER Project Number: 1096  
 Site Address: 9235 107th STREET Natural Resource Technology, Inc. Task Number: \_\_\_\_\_  
MILWAUKEE WI 23713 W. Paul Road Pewaukee, WI 53072 Telephone (414) 523-9000 Fax (414) 523-9001

Temperature of temperature blank \_\_\_\_\_  
 If sample(s) were received on ice and there was ice remaining, you may report the temperature as "received on ice". If all of the ice was melted, the temperature of the melt may be substituted for a temperature blank.

I hereby certify that I received, properly handled, and maintained custody of these samples as noted below:

Relinquished By (Signature): <u>Beccum / Oyle</u>	Date/Time: <u>08/18/95 17:18</u>	Received By (Signature): <u>FED EX 6494984474</u>	Date/Time: _____
Relinquished By (Signature): _____	Date/Time: _____	Received By (Signature): <u>Kenneth Constanline</u>	Date/Time: <u>21/15/95 / 10:50</u>
Relinquished By (Signature): _____	Date/Time: _____	Received By (Signature): _____	Date/Time: _____

Analytical Method / Numbers  
 Lab Use Only  
 Sample Conditions @ Laboratory

PDOC (W/LIST)  
 PAH (W/LIST)  
 VOC (W/LIST)  
 GRO (W/LIST)  
 DRD (W/LIST)  
 TOTAL LEAD

Field ID Number	Date Collected	Time Collected	Sample		Location / Description	PID Reading	Field Comments	Preserv. Type	# of Cont.	Analytical Method / Numbers						Lab ID Number	Sample Conditions @ Laboratory
			Media	Device													
SB-101(3.5)	08/18/95	15:15	SOIL	SS							X	X	X	X	X		
MW-11(3.5)		16:10									X	X					
SB-102(3.5)		14:40									X	X	X	X	X		
MW-101(3.5)		11:15									X	X	X	X	X		
METHANOL	BLANK												X				

NOT RECD  
 PDOC  
 EPAHS  
 PEPLS  
 SOILS  
 GRO  
 DRD  
 PAPPD  
 P65F  
 P3050

SPECIAL INSTRUCTIONS: \_\_\_\_\_  
 Laboratory shall retain samples for 30 days after issuing analytical report unless indicated otherwise below:  
 Return \_\_\_\_\_ Other \_\_\_\_\_

**EX** USA Airbill

Tracking Number **6494484474**

Recipient's

190 500 43677102 51

Sender's Name **Becky Koopke** Phone **(919) 523 9200**

Company **Natura Resource Tech** Dept./Floor Suite/Room

Address **23713 W Paul Rd**

City **Peewaukee** State **WI** Zip **53072**

**2** Your Internal Billing Reference Information **L3F4**

**3** To Recipient's Name \_\_\_\_\_ Phone **(313) 237-4775**

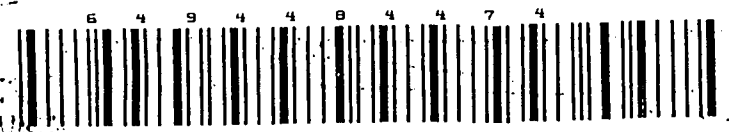
Company **SOUTHERN PETROLEUM LAB** Dept./Floor Suite/Room

Address **500 AMBASSADOR CAFFERY PKWY**

City **SCOTT** State **LA** Zip **70553**

For "HOLD" Service check here  
 Weekday  Saturday  
(Not available at all locations)

For Saturday Delivery check here  
 Extra Charge Not available to all locations

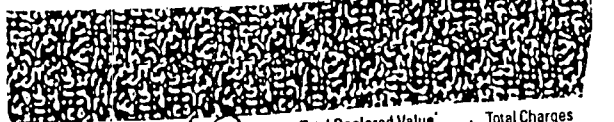


**4 Service\***  
 FedEx Priority Overnight (Next business morning)  
 FedEx Govt. Overnight (Authorized users only)  
 FedEx Overnight Freight (If packages over 150 pounds. Call for delivery schedule.)  
 FedEx 2Day (Spec. business days)  
 FedEx 2Day Freight

**5 Packaging**  
 FedEx Letter\*  FedEx Pak\*  FedEx Box  FedEx Tube  Other Packaging  
\*Declared value limit \$500

**6 Special Handling**  
Does this shipment contain dangerous goods?  No  Yes (If yes, please specify in the Remarks section)  
 Dry Ice (Dry Ice: 9 UN 1845 III)  CA  Cargo Aircraft Only  
 Dangerous Goods Shipper's Declaration not required

**7 Payment**  
Bill to:  Sender (Account no. in section 1 will be billed)  Recipient (Enter FedEx account no. or Credit Card no. below)  Third Party  Credit Card  Cash/Check  
 Obtain Receipt from FedEx Account No.



Total Packages **1** Total Weight **40** lbs Total Declared Value **00** \$ Total Charges **00** \$  
\*When declaring a value higher than \$100 per package, an extra additional charge. See SERVICE CONDITIONS, DECLARED VALUE AND LIMIT OF LIABILITY section for further information.

**8 Release Signature**  
Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims.  
**194**

















LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-04

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-107 (3.5)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER	ND	8 P	µg/Kg
BENZENE	ND	1 P	µg/Kg
TOLUENE	ND	1 P	µg/Kg
ETHYLBENZENE	ND	1 P	µg/Kg
1,3,5 - TRIMETHYLBENZENE	ND	1 P	µg/Kg
1,2,4 - TRIMETHYLBENZENE	ND	1 P	µg/Kg
TOTAL XYLENE	ND	1 P	µg/Kg

Surrogate

% Recovery

4-Bromofluorobenzene

96

Method 8020

Analyzed by: TB

Date: 08/29/95

Sonication extraction

08/31/95

METHOD 3550 \*\*\*

Analyzed by: SW

Date: 08/31/95 10:00:00

Total Solids

84.8

0.1

Weight %

Method 2540G \*\*

Analyzed by: DB

Date: 08/30/95 15:00:00

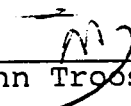
ND - Not detected.

(P) - Practical Quantitation Limit

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-05

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-108 (3.5)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER	ND	8 P	µg/Kg
BENZENE	ND	1 P	µg/Kg
TOLUENE	ND	1 P	µg/Kg
ETHYLBENZENE	ND	1 P	µg/Kg
1,3,5 - TRIMETHYLBENZENE	ND	1 P	µg/Kg
1,2,4 - TRIMETHYLBENZENE	ND	1 P	µg/Kg
TOTAL XYLENE	ND	1 P	µg/Kg

Surrogate

% Recovery

4-Bromofluorobenzene  
 Method 8020  
 Analyzed by: TB  
 Date: 08/29/95

93

Sonication extraction

08/31/95

METHOD 3550 \*\*\*  
 Analyzed by: SW  
 Date: 08/31/95 10:00:00

Total Solids

86.5

0.1

Weight %

Method 2540G \*\*  
 Analyzed by: DB  
 Date: 08/30/95 15:00:00

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-06

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-109 (3.5)

PROJECT NO: 1096  
 MATRIX: SOIL  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER	ND	8 P	µg/Kg
BENZENE	ND	1 P	µg/Kg
TOLUENE	ND	1 P	µg/Kg
ETHYLBENZENE	ND	1 P	µg/Kg
1,3,5 - TRIMETHYLBENZENE	ND	1 P	µg/Kg
1,2,4 - TRIMETHYLBENZENE	ND	1 P	µg/Kg
TOTAL XYLENE	ND	1 P	µg/Kg

Surrogate

% Recovery

4-Bromofluorobenzene  
 Method 8020  
 Analyzed by: TB  
 Date: 08/29/95

83

Sonication extraction

08/31/95

METHOD 3550 \*\*\*  
 Analyzed by: SW  
 Date: 08/31/95 10:00:00

Total Solids

85.7

0.1

Weight %

Method 2540G \*\*

Analyzed by: DB  
 Date: 08/30/95 15:00:00

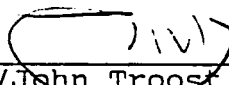
ND - Not detected.

(P) - Practical Quantitation Limit

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: DEPTH 2.5-4.5

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager







**APPENDIX E**

**MONITORING WELL INFORMATION FORM,  
MONITORING WELLS AND PIEZOMETERS SOIL BORING LOGS,  
WELL DEVELOPMENT FORMS, CONSTRUCTION FORMS, AND  
ABANDONMENT FORMS**

Facility Name		Facility ID Number		Date		Completed By (Name and Firm)																
CITGO MILWAUKEE BULK TERM.				10/25/95		REBECCA J. KOEPKE / NATURAL RESOURCE TECH																
Well Name	DNR Well ID Number	Well Location	N	S	E	W	Date Established	Well Casing		Elevations		Reference		Screen Length	Well Depth	Type of Well (✓)					Gradient U, S, D or N	
								Diam.	Type	Top of Well Casing	Ground Surface	MSL (✓)	Site Datum (✓)			PIEZ	OW	PW	LYS	Other		Abandoned
MW-101		1821.4	✓				08/16/95	Z	P	733.23	730.66	✓		10	15.96	✓					Y	D
		2026.0			✓																	
PZ-101		1825.2	✓				08/18/95	Z	P	733.40	730.96	✓		5	27.3	✓					Y	D
		2023.4			✓																	
MW-102		1822.4	✓				08/17/95	Z	P	731.14	731.60	✓		6	9.41	✓					Y	D
		1869.3			✓																	
PZ-102		1820.6	✓				08/18/95	Z	P	731.21	731.60	✓		5	23.96	✓					Y	D
		1872.7			✓																	
MW-103		1911.9	✓				08/17/95	Z	P	732.44	732.78	✓		6	9.45	✓					Y	S
		1825.8			✓																	
MW-104		1960.4	✓				08/18/95	Z	P	735.06	732.71	✓		10	15.91	✓					Y	U
		1989.7			✓																	
MW-105		1956.1	✓				08/16/95	Z	P	729.88	730.38	✓		10	13.05	✓					Y	S
		2161.2			✓																	
MW-106		1860.1	✓				08/25/95	Z	P	735.50	732.79	✓		10	16.50	✓					Y	NA
		1589.5			✓																	
MW-107		1891.3	✓				08/29/95	Z	P	736.31	733.30	✓		10	16.42	✓					Y	NA
		1413.7			✓																	
MW-108		1851.7	✓				08/25/95	Z	P	739.82	736.90	✓		10	15.77	✓					Y	NA
		1071.3			✓																	
MW-109		2088.6	✓				08/25/95	Z	P	737.14	734.28	✓		10	15.78	✓					Y	NA
		1013.8			✓																	
MW-110		2130.9	✓				08/22/95	Z	P	736.97	734.48	✓		10	15.67	✓					Y	NA
		1331.1			✓																	

Location Coordinates Are:

- Local Grid System (preferred)
- State Plane Coordinate
  - Northern
  - Central

Remarks: 100 SERIES WELLS/PIEZOMETERS INSTALLED BY NRT  
MW-1 THROUGH MW-8 INSTALLED BY TCT - INFORMATION  
REFERENCED FROM 1987 REPORT (WELL LOCATIONS

PSS Use:

File Maint. Completed: \_\_\_\_\_

Other: \_\_\_\_\_



<b>Property/Project Name</b> Congo Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-101	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/16/95		<b>Date Drilling Completed</b> 08/16/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b> MW-101	
<b>Final Static Water Level</b> 727.55 Feet MSL		<b>Surface Elevation</b> 730.71 Feet MSL		<b>Borehole Diameter</b> 8 inches	
<b>Boring Location State Plane</b> SE 1/4 of Ne 1/4 of Section 6, T8N, R21		<b>Feet N</b> <b>Feet E</b>		<b>Local Grid Location (If applicable)</b> 1821.4 feet <input checked="" type="checkbox"/> N 2026.0 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RGD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0	<u>SILTY GRAVEL</u> , med., ang., (FILL)	GM (FILL)									
MW-101 (3)	13	9	2	2'-4' <u>CLAY</u> , yellowish brown (10YR 5/4), 5% silt, tr. subrnd. crs. sand, firm, med. plast., moist, tr. organics, no odor, (FILL)	CL (FILL)			447						
MW-101 (8)	21	27	8	7'-9' <u>CLAY</u> , brown (7.5YR 5/3), tr-5% laminations of greenish gray (5GY 8/1) silt w/organics, tr. subrnd f. gravel, hard, sl. moist, med. plast., no odor	CL			26						
MW-101 (13)	18	38	12	12'-14' <u>CLAY</u> , gray-dk. gray (2.5Y 5-4/1), 5% silt, tr. f. subang. gravel, med-high plast., hard, dry-sl. moist	CL			9						
			14	<u>EOB @ 14'</u>										

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Rebecca J. O'Keefe* Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Facility/Project Name <b>Itigo Bulk Terminal</b>	Local Grid Location of Well 1821.4 ft. <input type="checkbox"/> N. <input checked="" type="checkbox"/> S. 2026.0 ft. <input type="checkbox"/> E. <input checked="" type="checkbox"/> W.	Well Name <b>MW-101</b>
License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21</b> <input type="checkbox"/> E. <input checked="" type="checkbox"/> W.	Date Well Installed <b>08/16/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>

A. Protective pipe, top elevation _____ ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <b>733.23</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: <b>5.0</b> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/> d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
C. Land surface elevation <b>730.60</b> ft. MSL	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
D. Surface seal, bottom <b>729.7</b> ft. MSL or <b>1.0</b> ft.	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 RED FLINT SAND</b> b. Volume added _____ ft <sup>3</sup>
Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
Describe <b>NA</b>	10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
17. Source of water (attach analysis): <b>NA</b>	b. Manufacturer <b>NORTHERN AIRE</b> c. Slot size: <b>0.010</b> in. d. Slotted length: <b>10.0</b> ft.
E. Bentonite seal, top _____ ft. MSL or _____ ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
F. Fine sand, top _____ ft. MSL or _____ ft.	
G. Filter pack, top <b>727.7</b> ft. MSL or <b>3.0</b> ft.	
H. Screen joint, top <b>727.2</b> ft. MSL or <b>3.5</b> ft.	
I. Well bottom <b>717.2</b> ft. MSL or <b>13.5</b> ft.	
J. Filter pack, bottom <b>716.7</b> ft. MSL or <b>14.0</b> ft.	
K. Borehole, bottom <b>716.7</b> ft. MSL or <b>14.0</b> ft.	
L. Borehole, diameter <b>8.2</b> in.	
M. O.D. well casing <b>2.1</b> in.	
N. I.D. well casing <b>1.9</b> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Stephanie [Signature] Firm **NATURAL RESOURCE TECHNOLOGY, INC.**

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO BULK TERMINAL 1016</u>	County Name <u>MILWAUKEE</u>	Well Name <u>MW-101</u>
Facility License, Permit or Monitoring Number _____	County Code <u>41</u>	Wis. Unique Well Number _____
		DNR Well Number _____

1. Can this well be purged dry?  Yes  No

2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other  \_\_\_\_\_

3. Time spent developing well 30 min.

4. Depth of well (from top of well casing) 15.96 ft.

5. Inside diameter of well 1.9 in.

Volume of water in filter pack and well casing 2.4 gal.

7. Volume of water removed from well 5 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

15. Additional comments on development:

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>12.57</u> ft.	<u>DRY</u> ft.
Date	b. <u>08/24/95</u> m m d d y y	<u>08/24/95</u> m m d d y y
Time	c. _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + TURBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>STEPHANIE VAN DYKE / SHELLY BRITTON</u>	Signature: <u>Stephanie Van Dyke</u>
Firm: <u>NATURAL RESOURCE TECH.</u>	Print Initials: <u>S A V</u>
	Firm: <u>NATURAL RESOURCE TECHNOLOGY</u>

<b>Facility/Project Name</b> Lululemon Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> PZ-101	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/17/95		<b>Date Drilling Completed</b> 08/18/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b> PZ-101	
<b>Final Static Water Level</b> 728.08 Feet MSL		<b>Surface Elevation</b> 730.96 Feet MSL		<b>Borehole Diameter</b> 14 and 8 inches	
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R21		<b>Feet N</b>  <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 1825.2 feet <input checked="" type="checkbox"/> N 2023.4 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RSD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			2	BLIND DRILL TO 15' W/ 8" (ID) HSA	GP										
			4	REFERENCE SOIL BORING LOG FOR MW-101	CL (FILL)										
			6	SET 10" PERMANENT CASING TO 15' W/ BENTONITE/CEMENT GROUT											
			8	CONTINUE DRILLING THROUGH CASING W/ 4-1/4" (ID) HSA											
			10		CL										
			12												
			14												
			16												
PZ-101 (18)	22	21	18	17'-19' SAND, lt brownish gray (2.5Y 6/2), prly graded, 5-10% silt, pred f., few med, subrnd-rnd., compact, few lamin., clay as above, wet, no odor	SP			5							
			20												
PZ-101 (25)	21	17	22	22'-24' SILTY SAND, gray (2.5Y 5/1), prly graded, <5% clay, f., compact, wet, no odor	SM			7							

Ø 22' SAND blew in augers to approx. 15', blew sand out and continued

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Thomas J. Doyle* Firm: Natural Resource Technology

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Facility/Project Name <b>Highgo Bulk Terminal/1096</b>	Local Grid Location of Well <b>1825.2 ft. N. 2023.4 ft. E.</b>	Well Name <b>PZ-101</b>
City License, Permit or Monitoring Number	Grid Origin Location	Wis. Unique Well Number DNR Well Number
Type of Well Water Table Observation Well <input type="checkbox"/> 11 Piezometer <input checked="" type="checkbox"/> 12	Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Date Well Installed <b>08/18/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21 E. W.</b>	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	

A. Protective pipe, top elevation \_\_\_\_\_ ft. MSL

B. Well casing, top elevation **733.40** ft. MSL

C. Land surface elevation **730.96** ft. MSL

D. Surface seal, bottom **726.0** ft. MSL or **5.0** ft.

12. USCS classification of soil near screen:

GP  GM  GC  GW  SW  SP   
SM  SC  ML  MH  CL  CH   
Bedrock

13. Sieve analysis attached?  Yes  No

14. Drilling method used: Rotary  50  
Hollow Stem Auger  41  
Other

15. Drilling fluid used: Water  02 Air  01  
Drilling Mud  03 None  99

Drilling additives used?  Yes  No

Describe **NA**

17. Source of water (attach analysis):  
**NA**

E. Bentonite seal, top \_\_\_\_\_ ft. MSL or \_\_\_\_\_ ft.

F. Fine sand, top **713.0** ft. MSL or **18.0** ft.

G. Filter pack, top **712.0** ft. MSL or **19.0** ft.

H. Screen joint, top **711.0** ft. MSL or **20.0** ft.

I. Well bottom **706.0** ft. MSL or **25.0** ft.

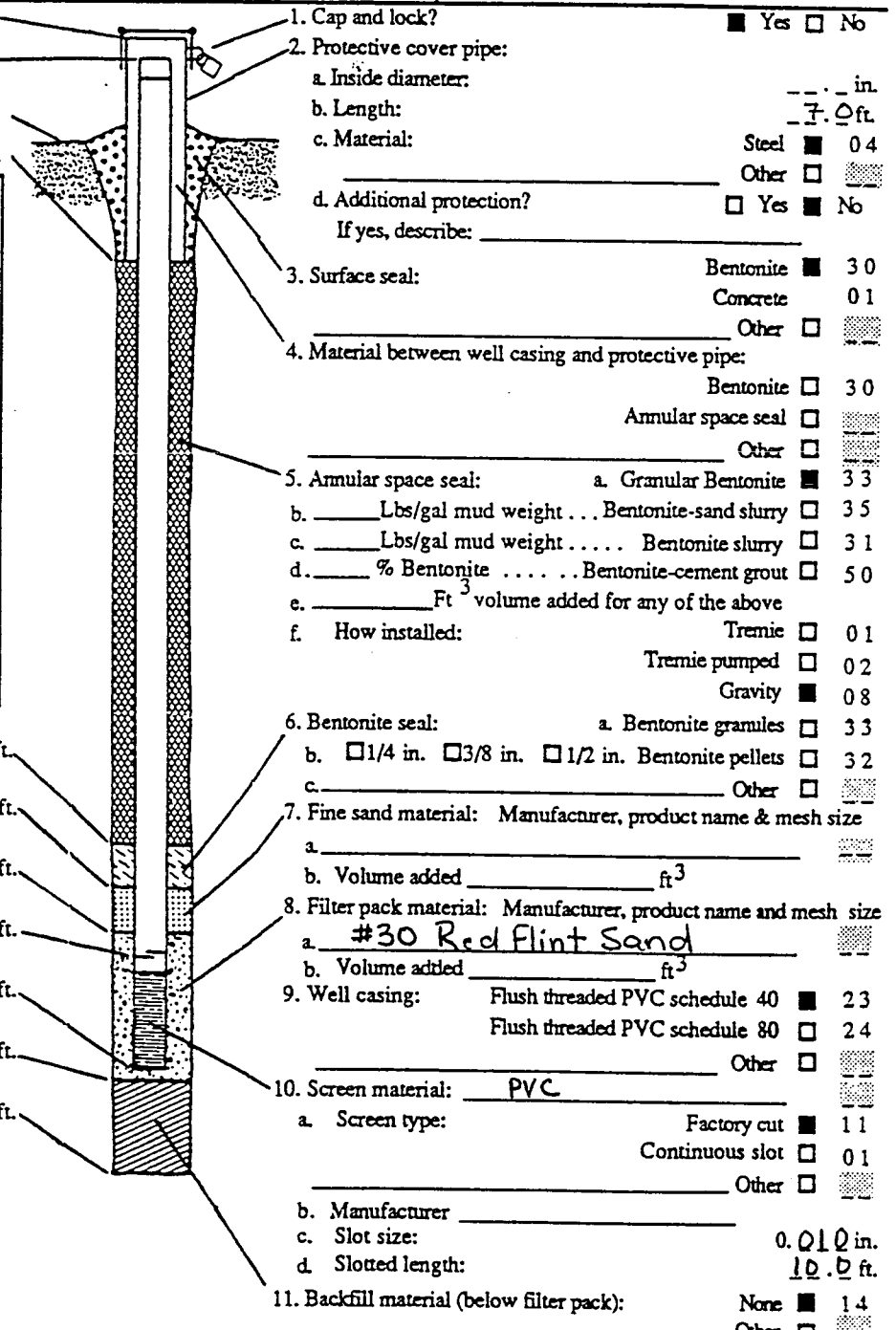
J. Filter pack, bottom **705.0** ft. MSL or **26.0** ft.

K. Borehole, bottom **705.0** ft. MSL or **26.0** ft.

L. Borehole, diameter **8.2** in.

M. O.D. well casing **2.1** in.

N. I.D. well casing **1.9** in.



I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature **Sophanie Van Dyke** Firm **NATURAL RESOURCE TECHNOLOGY, INC.**

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO BULK TERMINAL / 1090</u>	County Name <u>Milwaukee</u>	Well Name <u>PZ-101</u>
Facility License, Permit or Monitoring Number _____	County Code <u>41</u>	Wis. Unique Well Number _____
		DNR Well Number _____

<p>1. Can this well be purged dry? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>2. Well development method</p> <p>surged with bailer and bailed <input type="checkbox"/> 41</p> <p>surged with bailer and pumped <input checked="" type="checkbox"/> 61</p> <p>surged with block and bailed <input type="checkbox"/> 42</p> <p>surged with block and pumped <input type="checkbox"/> 62</p> <p>surged with block, bailed and pumped <input type="checkbox"/> 70</p> <p>compressed air <input type="checkbox"/> 20</p> <p>bailed only <input type="checkbox"/> 10</p> <p>pumped only <input type="checkbox"/> 51</p> <p>pumped slowly <input type="checkbox"/> 50</p> <p>Other <input type="checkbox"/> _____</p> <p>3. Time spent developing well <u>210</u> min.</p> <p>4. Depth of well (from top of well casing) <u>27.3</u> ft.</p> <p>5. Inside diameter of well <u>1.9</u> in.</p> <p>6. Volume of water in filter pack and well casing <u>7.1</u> gal.</p> <p>7. Volume of water removed from well <u>95</u> gal.</p> <p>8. Volume of water added (if any) <u>0.0</u> gal.</p> <p>9. Source of water added <u>NA</u></p> <p>10. Analysis performed on water added? <u>NA</u> <input type="checkbox"/> Yes <input type="checkbox"/> No (If yes, attach results)</p>	<table border="1"> <thead> <tr> <th></th> <th>Before Development</th> <th>After Development</th> </tr> </thead> <tbody> <tr> <td>11. Depth to Water (from top of well casing)</td> <td>a. <u>5.28</u> ft.</td> <td>_____ ft.</td> </tr> <tr> <td>Date</td> <td>b. <u>08/24/95</u> m m d d y y</td> <td><u>08/24/95</u> m m d d y y</td> </tr> <tr> <td>Time</td> <td>c. <u>1:40</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.</td> <td>____:____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.</td> </tr> <tr> <td>12. Sediment in well bottom</td> <td>_____ inches</td> <td>_____ inches</td> </tr> <tr> <td>13. Water clarity</td> <td>Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + CLOUDY AT FIRST THEN CLEAR</u></td> <td>Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)</td> </tr> </tbody> </table> <p>Fill in if drilling fluids were used and well is at solid waste facility:</p> <p>14. Total suspended solids _____ mg/l</p> <p>15. COD _____ mg/l</p>		Before Development	After Development	11. Depth to Water (from top of well casing)	a. <u>5.28</u> ft.	_____ ft.	Date	b. <u>08/24/95</u> m m d d y y	<u>08/24/95</u> m m d d y y	Time	c. <u>1:40</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	____:____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	12. Sediment in well bottom	_____ inches	_____ inches	13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + CLOUDY AT FIRST THEN CLEAR</u>	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)
	Before Development	After Development																	
11. Depth to Water (from top of well casing)	a. <u>5.28</u> ft.	_____ ft.																	
Date	b. <u>08/24/95</u> m m d d y y	<u>08/24/95</u> m m d d y y																	
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12. Sediment in well bottom	_____ inches	_____ inches																	
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + CLOUDY AT FIRST THEN CLEAR</u>	Clear <input checked="" type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)																	

16. Additional comments on development:

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>STEPHANIE VAN DYKE / STELLY BRITEN</u>	Signature: <u>Stephanie Van Dyke</u>
Firm: <u>NATURAL RESOURCE TECH.</u>	Print Initials: <u>SA</u> ✓
	Firm: <u>NATURAL RESOURCE TECHNOLOGY</u>

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

<b>City/Project Name</b> Chicago Bulk Terminal/Site Investigation-1096		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-102	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/17/95		<b>Date Drilling Completed</b> 08/17/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b> MW-102	
<b>Final Static Water Level</b> 728.55 Feet MSL		<b>Surface Elevation</b> 731.65 Feet MSL		<b>Borehole Diameter</b> 8 inches	
<b>Boring Location State Plane</b> SE 1/4 of NE 1/4 of Section 6, T8N, R 21		<b>Feet N</b> <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 1822.4 feet <input checked="" type="checkbox"/> N 1869.3 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			2	Blind drill to 10' REFERENCE SOIL BORING LOG FOR SB-104	ASPH GP										
			4		CL (FILL)										
			8		CL										
			10	EOB @ 10'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Shirley J. Doyle* Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Facility/Project Name <b>GO BULK TERMINAL</b>	Local Grid Location of Well 1822.4 ft. <input checked="" type="checkbox"/> N. <input type="checkbox"/> S. 1869.3 ft. <input type="checkbox"/> E. <input checked="" type="checkbox"/> W.	Well Name <b>MW-10Z</b>
City License, Permit or Monitoring Number	Grid Origin Location	Wis. Unique Well Number DNR Well Number
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	St. Plane _____ ft. N. _____ ft. E.	Date Well Installed <b>08/17/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary _____ ft.	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21</b> <input type="checkbox"/> E. <input checked="" type="checkbox"/> W.	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input checked="" type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	

A. Protective pipe, top elevation <b>731.14</b> ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <b>731.14</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: <b>1.0</b> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <b>731.6</b> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <b>730.6</b> ft. MSL or <b>1.0</b> ft.	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight . . . . Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite . . . . Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <b>NA</b>	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
17. Source of water (attach analysis): <b>NA</b>	8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 Red Flint Sand</b> b. Volume added _____ ft <sup>3</sup>
E. Bentonite seal, top _____ ft. MSL or _____ ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
F. Fine sand, top _____ ft. MSL or _____ ft.	10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
G. Filter pack, top <b>728.6</b> ft. MSL or <b>3.0</b> ft.	b. Manufacturer <b>NORTHERN AIRE</b>
H. Screen joint, top <b>728.1</b> ft. MSL or <b>3.5</b> ft.	c. Slot size: <b>0.010</b> in.
I. Well bottom <b>722.1</b> ft. MSL or <b>9.5</b> ft.	d. Slotted length: <b>10.0</b> ft.
J. Filter pack, bottom <b>721.6</b> ft. MSL or <b>10.0</b> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
K. Borehole, bottom <b>721.6</b> ft. MSL or <b>10.0</b> ft.	
L. Borehole, diameter <b>8.2</b> in.	
M. O.D. well casing <b>2.1</b> in.	
I.D. well casing <b>1.9</b> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature *Valencia J. Chade* Firm NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO BULK TERMINAL 1096</u>	County Name <u>Milwaukee</u>	Well Name <u>MW-102</u>
Facility License, Permit or Monitoring Number _____	County Code <u>41</u>	Wis. Unique Well Number _____
		DNR Well Number _____

1. Can this well be purged dry?  Yes  No

2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other  \_\_\_\_\_

3. Time spent developing well 30 min.

4. Depth of well (from top of well casing) 9.41 ft.

5. Inside diameter of well 1.9 in.

6. Volume of water in filter pack and well casing 4.7 gal.

7. Volume of water removed from well 5.0 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>2.63</u> ft.	<u>DRY.</u> ft.
Date	b. <u>08/25/95</u> m m d d y y	<u>08/25/95</u> m m d d y y
Time	c. <u>10:10</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	____:____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	____.____ inches	____.____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + TURBO</u>	Clear <input type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

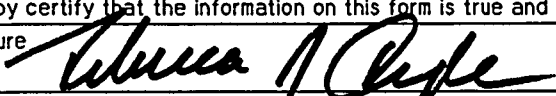
16. Additional comments on development:

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>STEPHANIE VAN DUKE / SHARLY BRITTON</u>	Signature: <u>Stephanie Van Dyke</u>
Firm: <u>NATURAL RESOURCE TECH</u>	Print Initials: <u>S A V</u>
	Firm: <u>NATURAL RESOURCE TECHNOLOGY</u>


<b>City/Project Name</b> Chicago Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> PZ-102	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/17/95		<b>Date Drilling Completed</b> 08/18/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Borehole Diameter</b> 12 and 8 inches	
<b>Common Well Name</b> PZ-102		<b>Final Static Water Level</b> 728.49 Feet MSL		<b>Surface Elevation</b> 731.60 Feet MSL	
<b>Boring Location State Plane</b> SE 1/4 of NE 1/4 of Section 6, T8N, R 21		<b>Feet N</b>  <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 1820.6 feet <input checked="" type="checkbox"/> N 1872.7 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Number and Type	Sample Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0-2	BLIND DRILL TO 17'	ASPH GP										
			2-4	REFERENCE SOIL BORING LOG FOR SB-104 SET PERMANENT 10" PVC CASING FROM 0'-15' CONTINUE DRILLING THROUGH CASING WITH 4-1/4" (ID) HSA	CL (FILL)										
			4-10		CL										
			10-22		SP										
			22-24	22'-24' SILTY SAND gray (2.5Y 5/1), pily graded, f.-med., trc clay, compact, wet, no odor.	SM										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature:  Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.08, Wis. Stats.

Sample		Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
Number and Type	Length Att. & Recovered (in)								Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			26		SM									
			28	EOB @ 26'										
			30											
			32											
			34											
			36											
			38											
			40											
			42											
			44											
			46											
			48											
			50											
			52											
			54											
			56											
			58											
			60											
			62											



City/Project Name <b>GO BULK TERMINAL</b>	Local Grid Location of Well 1820.6 ft. <input checked="" type="checkbox"/> N <input type="checkbox"/> S 1872.7 ft. <input type="checkbox"/> E <input checked="" type="checkbox"/> W	Well Name <b>PZ-10Z</b>
Utility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input type="checkbox"/> 11 Piezometer <input checked="" type="checkbox"/> 12	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21</b> <input type="checkbox"/> E <input checked="" type="checkbox"/> W	Date Well Installed <b>08/18/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>

A. Protective pipe, top elevation _____ ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <b>731.21</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: _____ ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <b>731.6</b> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <b>726.6</b> ft. MSL or <b>5.0</b> ft.	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <b>NA</b>	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
17. Source of water (attach analysis): <b>NA</b>	8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 Red Flint Sand</b> b. Volume added _____ ft <sup>3</sup>
E. Bentonite seal, top _____ ft. MSL or _____ ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
F. Fine sand, top <b>713.6</b> ft. MSL or <b>18.0</b> ft.	10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
G. Filter pack, top <b>712.6</b> ft. MSL or <b>19.0</b> ft.	b. Manufacturer _____ c. Slot size: <b>0.010</b> in. d. Slotted length: <b>10.0</b> ft.
H. Screen joint, top <b>711.6</b> ft. MSL or <b>20.0</b> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
I. Well bottom <b>706.6</b> ft. MSL or <b>25.0</b> ft.	
J. Filter pack, bottom <b>705.6</b> ft. MSL or <b>26.0</b> ft.	
K. Borehole, bottom <b>705.6</b> ft. MSL or <b>26.0</b> ft.	
L. Borehole, diameter <b>8.2</b> in.	
M. O.D. well casing <b>2.1</b> in.	
N. I.D. well casing <b>1.9</b> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
Signature Stephanie Van Dyke Firm NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>1096 CITGO Bulk Terminal</u>	County Name <u>Milwaukee</u>	Well Name <u>PZ-102</u>
Facility License, Permit or Monitoring Number	County Code <u>41</u>	Wis. Unique Well Number
		DNR Well Number

1. Can this well be purged dry?  Yes  No

2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 23.96 ft.

Inside diameter of well 1.9 in.

6. Volume of water in filter pack and well casing 6.9 gal.

7. Volume of water removed from well 85 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>2.90</u> ft.	_____ ft.

Date	b. <u>08/28/95</u> m m d d y y	<u>08/28/95</u> m m d d y y
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Time	c. <u>12:00</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	____:____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
------	--	---

12. Sediment in well bottom	_____ inches	_____ inches
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13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>Fine + Cloudy</u>	Clear <input type="checkbox"/> 20 Turbid <input type="checkbox"/> 25 (Describe)
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Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____ mg/l	_____ mg/l
----------------------------	------------	------------

15. COD	_____ mg/l	_____ mg/l
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15. Additional comments on development:

Well developed by: Person's Name and Firm

Name: STEPHANIE VAN DYKE / SITELUB EXPLOR

Firm: \_\_\_\_\_

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: Stephanie Van Dyke

Print Initials: SAV

Firm: NATURAL RESOURCE TECHNOLOGY

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>Company/Project Name</b> Citgo Bulk Terminal/Site Investigation-1096			<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-103
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services			<b>Date Drilling Started</b> 08/17/95	<b>Date Drilling Completed</b> 08/17/95	<b>Drilling Method</b> 4-1/4" (ID) HSA
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b> MW-103	<b>Final Static Water Level</b> 729.94 Feet MSL	<b>Surface Elevation</b> 732.80 Feet MSL	<b>Borehole Diameter</b> 8 inches
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R 21			<b>Feet N</b>  <b>Feet E</b>	<b>Local Grid Location (if applicable)</b> 1911.9 feet <input checked="" type="checkbox"/> N 1825.8 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	<b>Lat</b>  <b>Long</b>
<b>County</b> Milwaukee		<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RGD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			2	Blind drill to 10' REFERENCE SOIL BORING LOG FOR SB-105	ASPH GP										
			4		CL (FILL)										
			6		CL										
			10	EOB @ 10'											
			12		SP										
			14	Soil Boring SB-105 was drilled adjacent to MW-103 and was sampled to 14'. Corresponding lithology is shown in the adjacent USCS & Graphic Log columns.											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

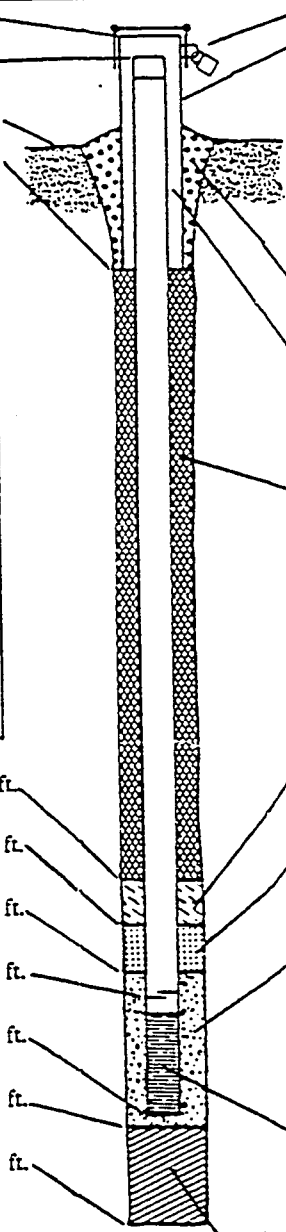
Signature: *Debra J. Geyde* Firm: Natural Resource Technology

This form is authorized by Chapters 144.47 and 182, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 182.06, Wis. Stats.

Project Name <b>GO BULK TERMINAL</b>	Local Grid Location of Well 1911.9 ft. <input checked="" type="checkbox"/> N. <input type="checkbox"/> S. 1825.8 ft. <input type="checkbox"/> E. <input checked="" type="checkbox"/> W.	Well Name <b>MW-103</b>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or	Wis. Unique Well Number: _____ DNR Well Number: _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	St. Plane _____ ft. N. _____ ft. E.	Date Well Installed <b>08/17/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21 E.</b>	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input checked="" type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	

A. Protective pipe, top elevation <b>732.44</b> ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <b>732.44</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: <b>1.0</b> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <b>732.8</b> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <b>731.8</b> ft. MSL or <b>1.0</b> ft.	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>

12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <b>NA</b>
17. Source of water (attach analysis): <b>NA</b>



E. Bentonite seal, top _____ ft. MSL or _____ ft.	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. Other <input type="checkbox"/>
F. Fine sand, top _____ ft. MSL or _____ ft.	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
G. Filter pack, top <b>729.8</b> ft. MSL or <b>3.0</b> ft.	8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 Red Flint Sand</b> b. Volume added _____ ft <sup>3</sup>
H. Screen joint, top <b>729.3</b> ft. MSL or <b>3.5</b> ft.	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
I. Well bottom <b>723.3</b> ft. MSL or <b>9.5</b> ft.	10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
J. Filter pack, bottom <b>722.8</b> ft. MSL or <b>10.0</b> ft.	b. Manufacturer <b>NORTHERN AIRE</b> c. Slot size: <b>0.010</b> in. d. Slotted length: <b>10.0</b> ft.
K. Borehole, bottom <b>722.8</b> ft. MSL or <b>10.0</b> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
L. Borehole, diameter <b>8.2</b> in.	
M. O.D. well casing <b>2.1</b> in.	
I.D. well casing <b>1.9</b> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Stephanie Van Dyke Firm NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. See instructions for more information including where the completed form should be sent.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO BULK TERMINAL 1096</u>	County Name <u>Milwaukee</u>	Well Name <u>MW-103</u>
Facility License, Permit or Monitoring Number _____	County Code <u>41</u>	Wis. Unique Well Number _____
		DNR Well Number _____

1. Can this well be purged dry?  Yes  No

2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other \_\_\_\_\_

3. Time spent developing well 30 min.

4. Depth of well (from top of well casing) 9.45 ft.

Inside diameter of well 1.9 in.

5. Volume of water in filter pack and well casing 4.8 gal.

7. Volume of water removed from well 10.5 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>2.49</u> ft.	<u>DRY</u> ft.
Date	b. <u>08/25/95</u> m m d d y y	<u>08/25/95</u> m m d d y y
Time	c. _____ <input type="checkbox"/> a.m. _____ <input type="checkbox"/> p.m.	_____ <input type="checkbox"/> a.m. _____ <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + TURBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>TAN + TURBID</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

I hereby certify that the above information is true and correct to the best of my knowledge.

Name: STEPHANIE VANDUYKE KHELL: BRITAN  
Firm: NATURAL RESOURCE TECH

Signature: Stephanie Van Dyke  
Print Initials: S A V  
Firm: NATURAL RESOURCE TECHNOLOGY

<b>City/Project Name</b> Citigo Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-104	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/18/95		<b>Date Drilling Completed</b> 08/18/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b> MW-104	
<b>Final Static Water Level</b> 730.14 Feet MSL		<b>Surface Elevation</b> 732.71 Feet MSL		<b>Borehole Diameter</b> 8 inches	
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R21		<b>Feet N</b> <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 1960.4 feet <input checked="" type="checkbox"/> N 1989.7 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0-2	ASPHALT w/ GRAVEL SUBGRADE	ASPH GP (FILL)										
MW-104 (3.5)	18	15	2-4	2.5'-4.5' SILTY CLAY, dk grysh brown (10YR 4/2), 5-10% subang. f. gravel, low plast., firm-hard, sl. moist, no odor (FILL)	CL (FILL)			<1							
MW-104 (7.5)	22	19	4-8	7.5'-9.5' CLAY, brown (10YR 5/3) w/ occass. vf. lamin. silt, 5% f. subang. gravel, med. plast., moist, no odor	CL			<1							
MW-104 (13.5)	19	26	8-14	12.5'-14.5' As above				<1							
			14-16	EOB @ 14.5'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Valencia J. Doyle* Firm: **Natural Resource Technology**

This form is authorized by Chapters 4.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Project Name <u>30 BULK PETROLEUM TERMINAL</u>	Local Grid Location of Well <u>1960.4 ft. N. 1989.7 ft. E.</u>	Well Name <u>MW-104</u>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source <u>SE 1/4 of NE 1/4 of Sec. 6 T. 2 N. R. 21 E.</u>	Date Well Installed <u>08/18/95</u> m m d d y y
Distance Well Is From Waste/Source Boundary ft. _____	Location of Well Relative to Waste/Source u <input checked="" type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) <u>MIDWEST ENGINEERING</u>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

A. Protective pipe, top elevation \_\_\_\_\_ ft. MSL  
 B. Well casing, top elevation 735.06 ft. MSL  
 C. Land surface elevation 732.7 ft. MSL  
 D. Surface seal, bottom 731.7 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:  
 GP  GM  GC  GW  SW  SP   
 SM  SC  ML  MH  CL  CH   
 Bedrock

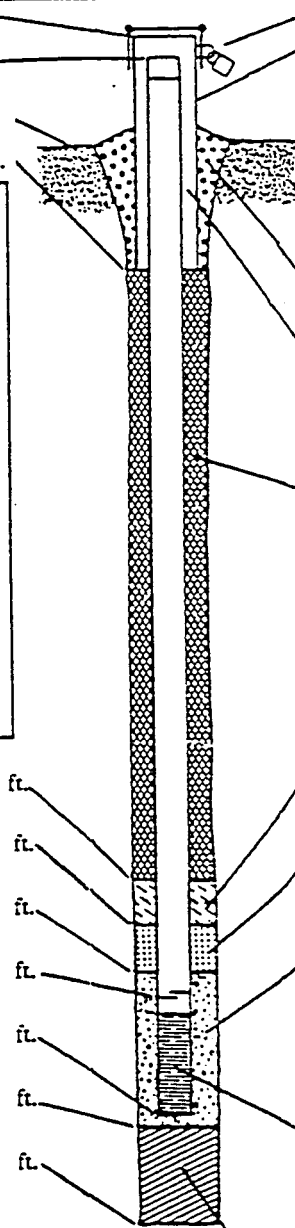
13. Sieve analysis attached?  Yes  No

14. Drilling method used: Rotary  50  
 Hollow Stem Auger  41  
 Other

15. Drilling fluid used: Water  02 Air  01  
 Drilling Mud  03 None  99

16. Drilling additives used?  Yes  No  
 Describe NA

17. Source of water (attach analysis):  
NA



1. Cap and lock?  Yes  No
2. Protective cover pipe:
  - a. Inside diameter: \_\_\_\_\_ in.
  - b. Length: 1.0 ft.
  - c. Material: Steel  04  
Other
  - d. Additional protection?  Yes  No  
If yes, describe: \_\_\_\_\_
3. Surface seal: Bentonite  30  
Concrete  01  
Other
4. Material between well casing and protective pipe: Bentonite  30  
Annular space seal   
Other
5. Annular space seal:
  - a. Granular Bentonite  33
  - b. \_\_\_\_\_ Lbs/gal mud weight ... Bentonite-sand slurry  35
  - c. \_\_\_\_\_ Lbs/gal mud weight ... Bentonite slurry  31
  - d. \_\_\_\_\_ % Bentonite ... Bentonite-cement grout  50
  - e. \_\_\_\_\_ Ft<sup>3</sup> volume added for any of the above
  - f. How installed: Tremie  01  
Tremie pumped  02  
Gravity  08
6. Bentonite seal:
  - a. Bentonite granules  33
  - b.  1/4 in.  3/8 in.  1/2 in. Bentonite pellets  32
  - c. \_\_\_\_\_ Other
7. Fine sand material: Manufacturer, product name & mesh size  
 a. \_\_\_\_\_  
 b. Volume added \_\_\_\_\_ ft<sup>3</sup>
8. Filter pack material: Manufacturer, product name and mesh size  
 a. #30 Red Flint Sand  
 b. Volume added \_\_\_\_\_ ft<sup>3</sup>
9. Well casing: Flush threaded PVC schedule 40  23  
 Flush threaded PVC schedule 80  24  
 Other
10. Screen material: PVC
  - a. Screen type: Factory cut  11  
Continuous slot  01  
Other
  - b. Manufacturer NORTHERN PIPE
  - c. Slot size: 0.010 in.
  - d. Slotted length: 10.0 ft.
11. Backfill material (below filter pack): None  14  
Other

E. Bentonite seal, top \_\_\_\_\_ ft. MSL or \_\_\_\_\_ ft.  
 F. Fine sand, top \_\_\_\_\_ ft. MSL or \_\_\_\_\_ ft.  
 G. Filter pack, top 729.7 ft. MSL or 3.0 ft.  
 H. Screen joint, top 729.2 ft. MSL or 3.5 ft.  
 I. Well bottom 719.2 ft. MSL or 13.5 ft.  
 J. Filter pack, bottom 718.2 ft. MSL or 14.5 ft.  
 K. Borehole, bottom 718.2 ft. MSL or 14.5 ft.  
 L. Borehole, diameter 8.2 in.  
 M. O.D. well casing 2.1 in.  
 N. well casing 1.9 in.

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature Stephanie Van Dyke Firm Natural Resource Technology, Inc.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO BULK TERMINAL 1096</u>	County Name <u>MILWAUKEE</u>	Well Name <u>MW-104</u>
Facility License, Permit or Monitoring Number _____	County Code <u>41</u>	Wis. Unique Well Number _____
		DNR Well Number _____

1. Can this well be purged dry?  Yes  No
2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other \_\_\_\_\_
3. Time spent developing well 30 min.
4. Depth of well (from top of well casing) 15.91 ft.
- Inside diameter of well 1.9 in.
6. Volume of water in filter pack and well casing 8.8 gal.
7. Volume of water removed from well 5.0 gal.
8. Volume of water added (if any) 0.0 gal.
9. Source of water added NA
10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>3.10</u> ft.	<u>DRY</u> ft.
Date	b. <u>08/24/95</u> m m d d y y	<u>08/24/95</u> m m d d y y
Time	c. _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>BROWN TURBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>BROWN</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: STEPHANIE VAN DYKE / SHELLY BRITTON

Firm: NATURAL RESOURCE TECH

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: Stephanie Van Dyke

Print Initials: S A V

Firm: NATURAL RESOURCE TECHNOLOGY, INC

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.



<b>City/Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-105	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services			<b>Date Drilling Started</b> 08/16/95	<b>Date Drilling Completed</b> 08/16/95	<b>Drilling Method</b> 4-1/4" (ID) HSA
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b> MW-105	<b>Final Static Water Level</b> 726.98 Feet MSL	<b>Surface Elevation</b> 730.38 Feet MSL	<b>Borehole Diameter</b> 8 inches
<b>Boring Location State Plane</b> SE 1/4 of NE 1/4 of Section 6, T8N, R21		<b>Feet N</b>  <b>Feet E</b>	<b>Lat Long</b>	<b>Local Grid Location (if applicable)</b> 1956.1 feet <input checked="" type="checkbox"/> N 2161.2 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee		

Sample Number and Type	Length Att. & Recovered (ft)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
				CLAYEY SILT, black w/ abundant organics	OF (FILL)										
MW-105 (3)	18	12	2	2'-4' CLAY, mottled strong brown (7.5YR 5/8), olive yellow (3.5Y 8/6) & drk grayish brown (10YR 4/2), soft, 5% gravel, v. moist, no odor (FILL)	CL (FILL)			614							
MW-105 (8)	21	22	8	7'-9' CLAY, laminated pinkish gray (7.5YR 8/2) & yellowish brown (10YR 5/6) w/ occas. vf. lamin. greenish gray (10G 8/1) silt, trc blk mottling, trc f. subang gravel, hard, moist, (silt - v. moist) no odor (Lacustrine)	CL			83							
MW-105	22	14	12	12'-14' CLAY, brown 10YR 5-4/3, med. plast. trc-5% (decrease w/ depth) f. gravel, crs. sand, subang-subrnd, firm-hard, trc yellowish brown (10YR 5/8) mottling, trc black mottling, sl. moist-dry, no odor				13							
			14	EOB @ 14'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Julius J. O'Connell* Firm: Natural Resource Technology

This form is authorized by Chapters 44.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Project Name <b>GO BULK TERMINAL</b>	Local Grid Location of Well 1956.1 ft. <input checked="" type="checkbox"/> N <input checked="" type="checkbox"/> S, 2161.2 ft. <input type="checkbox"/> E. <input type="checkbox"/> W	Well Name <b>MW-105</b>
County License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21</b> <input type="checkbox"/> E. <input type="checkbox"/> W.	Date Well Installed <b>08/16/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input checked="" type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

A. Protective pipe, top elevation 729.88 ft. MSL

B. Well casing, top elevation 729.88 ft. MSL

C. Land surface elevation 730.4 ft. MSL

D. Surface seal, bottom 729.4 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:  
GP  GM  GC  GW  SW  SP   
SM  SC  ML  MH  CL  CH   
Bedrock

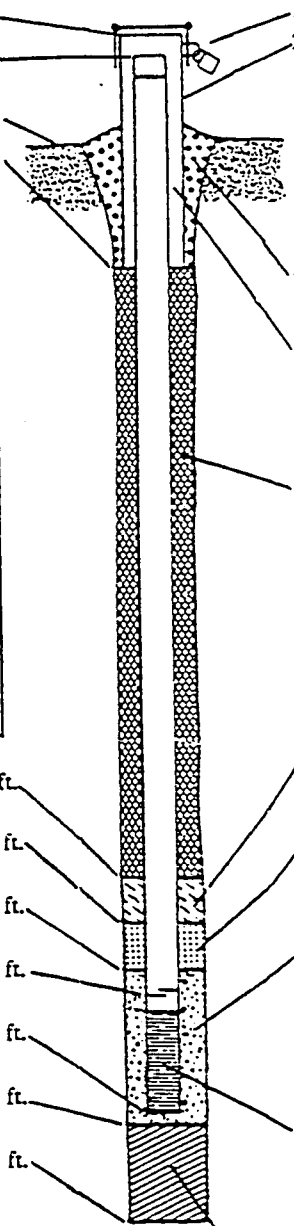
13. Sieve analysis attached?  Yes  No

14. Drilling method used: Rotary  50  
Hollow Stem Auger  41  
Other  \_\_\_\_\_

15. Drilling fluid used: Water  02 Air  01  
Drilling Mud  03 None  99

16. Drilling additives used?  Yes  No  
Describe NA

17. Source of water (attach analysis):  
NA



1. Cap and lock?  Yes  No

2. Protective cover pipe:  
a. Inside diameter: \_\_\_\_\_ in.  
b. Length: 1.0 ft.  
c. Material: Steel  04  
Other  \_\_\_\_\_

d. Additional protection?  Yes  No  
If yes, describe: \_\_\_\_\_

3. Surface seal: Bentonite  30  
Concrete  01  
Other  \_\_\_\_\_

4. Material between well casing and protective pipe:  
Bentonite  30  
Annular space seal  \_\_\_\_\_  
Other  \_\_\_\_\_

5. Annular space seal:  
a. Granular Bentonite  33  
b. \_\_\_\_\_ Lbs/gal mud weight . . . Bentonite-sand slurry  35  
c. \_\_\_\_\_ Lbs/gal mud weight . . . . Bentonite slurry  31  
d. \_\_\_\_\_ % Bentonite . . . . . Bentonite-cement grout  50  
e. \_\_\_\_\_ Ft<sup>3</sup> volume added for any of the above  
f. How installed: Tremie  01  
Tremie pumped  02  
Gravity  03

6. Bentonite seal:  
a. Bentonite granules  33  
b.  1/4 in.  3/8 in.  1/2 in. Bentonite pellets  32  
c. \_\_\_\_\_ Other  \_\_\_\_\_

7. Fine sand material: Manufacturer, product name & mesh size  
a. \_\_\_\_\_  
b. Volume added \_\_\_\_\_ ft<sup>3</sup>

8. Filter pack material: Manufacturer, product name and mesh size  
a. #30 Red Flint Sand  
b. Volume added \_\_\_\_\_ ft<sup>3</sup>

9. Well casing: Flush threaded PVC schedule 40  23  
Flush threaded PVC schedule 80  24  
Other  \_\_\_\_\_

10. Screen material: PVC  
a. Screen type: Factory cut  11  
Continuous slot  01  
Other  \_\_\_\_\_  
b. Manufacturer NORTHERN AIRE  
c. Slot size: 0.010 in.  
d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack): None  14  
Other  \_\_\_\_\_

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Stephanie Van Dyke Firm NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO BULK TERMINAL 1096</u>	County Name <u>Milwaukee</u>	Well Name <u>MW-105</u>
Facility License, Permit or Monitoring Number	County Code <u>41</u>	Wis. Unique Well Number
		DNR Well Number

1. Can this well be purged dry?  Yes  No
2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other
3. Time spent developing well 30 min.
4. Depth of well (from top of well casing) 13.05 ft.
- 1.9 in. Inside diameter of well
5. Volume of water in filter pack and well casing 6.9 gal.
7. Volume of water removed from well 5 gal.
8. Volume of water added (if any) 0.0 gal.
9. Source of water added NA
10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>3.05</u> ft.	<u>DRY</u> ft.
Date	b. <u>08/24/95</u> m m d d y y	<u>08/24/95</u> m m d d y y
Time	c. _____ : _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ : _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>THIS IS TURBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>TAN</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: STEPHANIE VAN DYKE / SHELLY BRITTON

Firm: NATURAL RESOURCE TECH

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: Stephanie Van Dyke

Print Initials: SAV

Firm: NATURAL RESOURCE TECHNOLOGY

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

City/Project Name <i>Bulk Terminal/Site Investigation (1096)</i>		License/Permit/Monitoring Number		Boring Number <i>MW-106</i>	
Boring Drilled By (Firm name and name of crew chief) <i>Midwest Engineering Services</i>		Date Drilling Started <i>08/25/95</i>	Date Drilling Completed <i>08/25/95</i>	Drilling Method <i>4-1/4" (ID) HSA</i>	
DNR Facility Well No.	WI Unique Well No.	Common Well Name <i>MW-106</i>	Final Static Water Level <i>729.69 Feet MSL</i>	Surface Elevation <i>732.79 Feet MSL</i>	Borehole Diameter <i>8 inches</i>
Boring Location State Plane <i>SE 1/4 of NW 1/4 of Section 6, T8N, R21</i>		Feet N	Feet E	Lat	Long
County <i>Milwaukee</i>		DNR County Code <i>41</i>	Civil Town/City/ or Village <i>City of Milwaukee</i>		

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0-2	GRAVEL, crs., angular	GP									
MW-106 (3.5)	24	11	2-4	CLAY brown (10YR 5/1), trc sand & silt, f., similar to MW-107, silt content decreases w/ depth	CL									
MW-106 (8.5)	24	35	4-8	SAND red brown to brown, vf., wet, trc clay, v. slight hydrocarbon odor, occasional ang. gravels	SP									
MW-106 (13.5)	-	24	8-14	SILT gray (10YR 4/4), clean, prly sorted silt, wet, compact, firm	ML									
			14-16	EOB @ 14.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Eric Sawatch* Firm: **Natural Resource Technology**

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Project Name <b>GO BULK TERMINAL</b>	Local Grid Location of Well 1860.1 ft. N. 1589.5 ft. W.	Well Name <b>MW-106</b>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N., R. 21 E.</b>	Date Well Installed <b>08/25/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary <b>NA</b> ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input checked="" type="checkbox"/> Not Known NA	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

A. Protective pipe, top elevation <del>NOT SURVEYED</del> _____ ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <b>735.50</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: <b>50</b> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <b>732.8</b> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <b>731.8</b> ft. MSL or <b>10</b> ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input checked="" type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input checked="" type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 03
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <b>NA</b>	8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 Red Flint Sand</b> b. Volume added _____ ft <sup>3</sup>
17. Source of water (attach analysis): <b>NA</b>	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top _____ ft. MSL or _____ ft.	10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top _____ ft. MSL or _____ ft.	b. Manufacturer <b>NORTHERN AIRE</b> c. Slot size: <b>0.010</b> in. d. Slotted length: <b>10.0</b> ft.
G. Filter pack, top <b>729.8</b> ft. MSL or <b>30</b> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
H. Screen joint, top <b>729.3</b> ft. MSL or <b>35</b> ft.	
I. Well bottom <b>719.3</b> ft. MSL or <b>135</b> ft.	
J. Filter pack, bottom <b>718.3</b> ft. MSL or <b>145</b> ft.	
K. Borehole, bottom <b>718.3</b> ft. MSL or <b>145</b> ft.	
L. Borehole, diameter <b>8.2</b> in.	
M. O.D. well casing <b>2.1</b> in.	
N. I.D. well casing <b>1.9</b> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Stephanie Van Dyke Firm NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. For more information including where the completed form should be sent.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO BULK TERMINAL</u>	County Name <u>MILWAUKEE</u>	Well Name <u>MW-1010</u>
Facility License, Permit or Monitoring Number _____	County Code <u>41</u>	Wis. Unique Well Number _____
		DNR Well Number _____

1. Can this well be purged dry?  Yes  No

2. Well development method

surged with bailer and bailed	<input type="checkbox"/> 41
surged with bailer and pumped	<input type="checkbox"/> 61
surged with block and bailed	<input type="checkbox"/> 42
surged with block and pumped	<input type="checkbox"/> 62
surged with block, bailed and pumped	<input type="checkbox"/> 70
compressed air	<input checked="" type="checkbox"/> 20
bailed only	<input type="checkbox"/> 10
pumped only	<input type="checkbox"/> 51
pumped slowly	<input type="checkbox"/> 50
Other _____	<input type="checkbox"/> _____

3. Time spent developing well \_\_\_\_\_ min.

4. Depth of well (from top of well casing) 16.5 ft.

5. Inside diameter of well 1.9 in.

6. Volume of water in filter pack and well casing 8.7 gal.

7. Volume of water removed from well 15 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>3.81</u> ft.	_____ ft.
Date	b. <u>08/28/95</u> m m d d y y	<u>08/28/95</u> m m d d y y
Time	c. <u>1:00</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	____:____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>THIN + TURBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>THIN</u>
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

Fill in if drilling fluids were used and well is at solid waste facility:

16. Additional comments on development:

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>STEPHANIE VAN DYKE / SHAW BRITTON</u>	Signature: <u>Stephanie Van Dyke</u>
Firm: <u>NATURAL RESOURCE TECH</u>	Print Initials: <u>SAY</u>
	Firm: <u>NATURAL RESOURCE TECHNOLOGY</u>

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

City/Project Name <i>Chicago Bulk Terminal/Site Investigation (1096)</i>		License/Permit/Monitoring Number		Boring Number <i>MW-107</i>	
Boring Drilled By (Firm name and name of crew chief) <i>Midwest Engineering Services</i>		Date Drilling Started <i>08/25/95</i>	Date Drilling Completed <i>08/25/95</i>	Drilling Method <i>4-1/4" (ID) HSA</i>	
DNR Facility Well No.	WI Unique Well No.	Common Well Name <i>MW-107</i>	Final Static Water Level <i>730.95 Feet MSL</i>	Surface Elevation <i>733.30 Feet MSL</i>	Borehole Diameter <i>8 inches</i>
Boring Location State Plane <i>SE 1/4 of NE 1/4 of Section 6, T8N, R21</i>		Feet N	Feet E	Lat	Long
County <i>Milwaukee</i>		DNR County Code <i>41</i>	Civil Town/City/ or Village <i>City of Milwaukee</i>		
Local Grid Location (If applicable) <i>1891.3 feet</i> <input checked="" type="checkbox"/> N <i>1413.7 feet</i> <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W					

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					ROD/ Comments	
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200		
			0-2	GRAVEL, crs., ang., (FILL)	GP										
MW-107 (3.5)	24	10	2-4	(Cuttings) SILTY CLAY red brown (10YR 5/4), dry-moist, sl. sticky, trc vf. sand, occas. gray mottling	ML										
			4-8	CLAY, occas. gravel, v. hard, stiff, firm, compact, fissured, (TILL)	CL										
MW-107 (8.5)	24	22	8-14	SILTY SAND red brown (10YR 5/4), wet, vf., compact, no odor, below 8' thin clay lamin.	SM										
MW-107 (13.5)	24	19	14-14.5	EOB @ 14.5'											

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *Eric P. Coatch*      Firm: **Natural Resource Technology**

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Project Name <b>GO BULK TERMINAL</b>	Local Grid Location of Well 1891.3 ft. <input checked="" type="checkbox"/> N <input type="checkbox"/> S 1413.7 ft. <input type="checkbox"/> E <input checked="" type="checkbox"/> W	Well Name <b>MW-107</b>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	St. Plane _____ ft. N. _____ ft. E.	Date Well Installed <u>08/25/95</u> m m d d y y
Distance Well Is From Waste/Source Boundary <b>NA</b> ft.	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21 E W.</b>	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input checked="" type="checkbox"/> Not-Known <b>NA</b>	

A. Protective pipe, top elevation NOT SURVEYED ft. MSL  
 B. Well casing, top elevation 736.3 ft. MSL  
 C. Land surface elevation 733.3 ft. MSL  
 D. Surface seal, bottom 732.3 ft. MSL or 1.0 ft.

12. USCS classification of soil near screen:  
 GP  GM  GC  GW  SW  SP   
 SM  SC  ML  MH  CL  CH   
 Bedrock

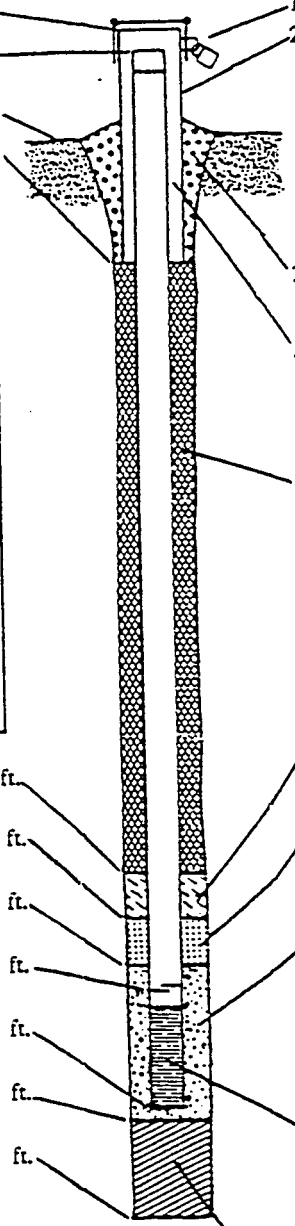
13. Sieve analysis attached?  Yes  No

14. Drilling method used: Rotary  50  
 Hollow Stem Auger  41  
 Other

15. Drilling fluid used: Water  02 Air  01  
 Drilling Mud  03 None  99

16. Drilling additives used?  Yes  No  
 Describe NA

17. Source of water (attach analysis):  
NA



1. Cap and lock?  Yes  No

2. Protective cover pipe:  
 a. Inside diameter: \_\_\_\_\_ in.  
 b. Length: 5.0 ft.  
 c. Material: Steel  04  
 Other

d. Additional protection?  Yes  No  
 If yes, describe: \_\_\_\_\_

3. Surface seal:  
 Bentonite  30  
 Concrete  01  
 Other

4. Material between well casing and protective pipe:  
 Bentonite  30  
 Annular space seal   
 Other

5. Annular space seal:  
 a. Granular Bentonite  33  
 b. \_\_\_\_\_ Lbs/gal mud weight . . . Bentonite-sand slurry  35  
 c. \_\_\_\_\_ Lbs/gal mud weight . . . . . Bentonite slurry  31  
 d. \_\_\_\_\_ % Bentonite . . . . . Bentonite-cement grout  50  
 e. \_\_\_\_\_ Ft<sup>3</sup> volume added for any of the above  
 f. How installed: Tremie  01  
 Tremie pumped  02  
 Gravity  08

6. Bentonite seal:  
 a. Bentonite granules  33  
 b.  1/4 in.  3/8 in.  1/2 in. Bentonite pellets  32  
 c. \_\_\_\_\_ Other

7. Fine sand material: Manufacturer, product name & mesh size  
 a. \_\_\_\_\_  
 b. Volume added \_\_\_\_\_ ft<sup>3</sup>

8. Filter pack material: Manufacturer, product name and mesh size  
 a. #30 Red Flint Sand  
 b. Volume added \_\_\_\_\_ ft<sup>3</sup>

9. Well casing: Flush threaded PVC schedule 40  23  
 Flush threaded PVC schedule 80  24  
 Other

10. Screen material: PVC  
 a. Screen type: Factory cut  11  
 Continuous slot  01  
 Other

b. Manufacturer NORTHERN AIRE  
 c. Slot size: 0.010 in.  
 d. Slotted length: 10.0 ft.

11. Backfill material (below filter pack):  
 None  14  
 Other

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Sophanie Van Dyke Firm NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. See instructions for more information including where the completed form should be sent.



Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CTGO Bulk Terminal 1096</u>	County Name <u>MILWAUKEE</u>	Well Name <u>MW-107</u>
Facility License, Permit or Monitoring Number _____	County Code <u>41</u>	Wis. Unique Well Number _____
		DNR Well Number _____

1. Can this well be purged dry?  Yes  No

2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other \_\_\_\_\_

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 16.4 ft.

5. Inside diameter of well 1.9 in.

6. Volume of water in filter pack and well casing 8.9 gal.

7. Volume of water removed from well 90 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>3.45</u> ft.	_____ ft.
Date	b. <u>08/29/95</u> m m d d y y	<u>08/29/95</u> m m d d y y
Time	c. <u>2:15</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	____:____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>cloudy/turbid</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>BROWN</u>

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

15. Additional comments on development:

Well developed by: Person's Name and Firm

Name: STEPHANIE VANDUYKE / SHERLY BRITTON  
Firm: NATURAL RESOURCE TECH

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: Stephanie VanDyke  
Print Initials: S AV  
Firm: NATURAL RESOURCE TECHNOLOGY

City/Project Name <i>Citgo Bulk Terminal/Site Investigation (1096)</i>		License/Permit/Monitoring Number		Boring Number <i>MW-108</i>	
Boring Drilled By (Firm name and name of crew chief) <i>Midwest Engineering Services</i>		Date Drilling Started <i>08/25/95</i>	Date Drilling Completed <i>08/25/95</i>	Drilling Method <i>4-1/4" (ID) HSA</i>	
DNR Facility Well No.	WI Unique Well No.	Common Well Name <i>MW-108</i>	Final Static Water Level <i>733.42 Feet MSL</i>	Surface Elevation <i>736.90 Feet MSL</i>	Borehole Diameter <i>8 inches</i>
Boring Location State Plane <i>SE 1/4 of NE 1/4 of Section 6, T8N, R21</i>		Feet N	Feet E	Local Grid Location (if applicable) <i>1851.7 feet</i> <input checked="" type="checkbox"/> N <i>1071.3 feet</i> <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> N	

County <i>Milwaukee</i>	DNR County Code <i>41</i>	Civil Town/City/ or Village <i>City of Milwaukee</i>
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Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2	GRAVEL, crs., ang., (FILL)	GP (FILL)									
MW-108 (3.5)	20	5	4	SILTY CLAY, red brown (10YR 4/4), trc sand & gravel, f., dry-moist, firm, occas. gray mott.	CL ML									
			6	SAND, red brown (10YR 4/4), vf., moist, loose	SP									
			6	saturated @ about 5.5'-6'										
MW-108 (8.5)	4	72	8	Cuttings suggest CLAYEY SAND, lots of CLAY - saturated about 5.5'-6'										Must have caught rock
			12	CLAYEY SAND/CLAY, brown - red brown (10YR 4/4), vf. sand & clay, loose-compact, wet, no odor	CP									
MW-108 (13.5)	24	49	14											
			14	EOB @ 14.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
 Signature: *Eric P. Beardsley* Firm: **Natural Resource Technology**

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Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO Bulk Terminal 1096</u>	County Name <u>Milwaukee</u>	Well Name <u>MW-108</u>
Facility License, Permit or Monitoring Number	County Code <u>41</u>	Wis. Unique Well Number
		DNR Well Number

1. Can this well be purged dry?  Yes  No
2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other
3. Time spent developing well 60 min.
4. Depth of well (from top of well casing) 15.77 ft.
- Inside diameter of well 1.9 in.
6. Volume of water in filter pack and well casing 8.5 gal.
7. Volume of water removed from well 15 gal.
8. Volume of water added (if any) 0.0 gal.
9. Source of water added NA
10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>3.48</u> ft.	_____ ft.
Date	b. <u>08/29/95</u> m m d d y y	<u>08/29/95</u> m m d d y y
Time	c. <u>12:20</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	____:____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>FINES + TURBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>BROWN</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>STEPHANIE VAN DYKE / SHELLY BEITON</u>	Signature: <u>Stephanie Van Dyke</u>
Firm: <u>NATURAL RESOURCE TECH</u>	Print Initials: <u>S A V</u>
	Firm: <u>NATURAL RESOURCE TECHNOLOGY</u>

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>City/Project Name</b> Citgo Bulk Terminal/Site Investigation-1096		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-109	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/25/95		<b>Date Drilling Completed</b> 08/25/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b> MW-109	
<b>Final Static Water Level</b> 733.53 Feet MSL		<b>Surface Elevation</b> 734.28 Feet MSL		<b>Borehole Diameter</b> 8 inches	
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R21		<b>Feet N</b>  <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 2088.6 feet <input checked="" type="checkbox"/> N 1013.8 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					ROD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0-2	GRAVEL, crs., ang., (FILL)	GP (FILL)									
MW-109 (3.5)	24	14	2-4	CLAY, drk. red brown (10YR 5/2), v. hard, v. stiff, moist, fissured, non plastic, high dry strength	CL									
MW-109 (8.5)	24	19	4-8	SILTY SAND, gray brown (2.5Y 6/1), v. fine, compact, wet, firm, no odor	SM									
MW-109 (13.5)	24	20	8-14											
			14-22	EOB @ 14.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Eric P. Kovatch Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.08, Wis. Stats.

Project Name <b>IGO BULK TERMINAL</b>		Local Grid Location of Well 2088.6 ft. <input type="checkbox"/> N <input type="checkbox"/> S 1013.8 ft. <input type="checkbox"/> E <input type="checkbox"/> W		Well Name <b>MW-109</b>	
Facility License, Permit or Monitoring Number		Grid Origin Location Lat. _____ Long. _____ or		Wis. Unique Well Number _____ DNR Well Number _____	
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12		St. Plane _____ ft. N. _____ ft. E.		Date Well Installed <b>08/25/95</b> m m d d y y	
Distance Well Is From Waste/Source Boundary <b>NA</b> ft.		Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N. R. 21</b> <input type="checkbox"/> E <input type="checkbox"/> W		Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>	
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input checked="" type="checkbox"/> Not Known NA			

A. Protective pipe, top elevation <del>NOT SURVEYED</del>	_____ ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation	<b>232.14</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: <b>3.0</b> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation	<b>234.3</b> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom	<b>233.3</b> ft. MSL or <b>1.0</b> ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>		4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight ... Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight ... Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite ... Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>		6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99		7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <b>NA</b>		8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 Red Flint Sand</b> b. Volume added _____ ft <sup>3</sup>
17. Source of water (attach analysis): <b>NA</b>		9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top _____ ft. MSL or _____ ft.		10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top _____ ft. MSL or _____ ft.		b. Manufacturer <b>NORTHERN AIRE</b> c. Slot size: <b>0.010</b> in. d. Slotted length: <b>10.0</b> ft.
G. Filter pack, top <b>231.3</b> ft. MSL or <b>3.0</b> ft.		11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
H. Screen joint, top <b>230.8</b> ft. MSL or <b>3.5</b> ft.		
I. Well bottom <b>220.8</b> ft. MSL or <b>13.5</b> ft.		
J. Filter pack, bottom <b>219.8</b> ft. MSL or <b>14.5</b> ft.		
K. Borehole, bottom <b>219.8</b> ft. MSL or <b>14.5</b> ft.		
L. Borehole, diameter <b>8.2</b> in.		
M. O.D. well casing <b>2.1</b> in.		
I.D. well casing <b>1.9</b> in.		

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Stephanie W. Drake Firm: NATURAL RESOURCE TECHNOLOGY, INC.

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.



- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>County/Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-110	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services			<b>Date Drilling Started</b> 08/22/95	<b>Date Drilling Completed</b> 08/22/95	<b>Drilling Method</b> 4-1/4" (ID) HSA
<b>DNR Facility Well No.</b>	<b>WI Unique Well No.</b>	<b>Common Well Name</b> MW-110	<b>Final Static Water Level</b> 732.10 Feet MSL	<b>Surface Elevation</b> 734.48 Feet MSL	<b>Borehole Diameter</b> 8 inches
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R21			<b>Feet N</b> Feet E	<b>Lat</b> Long	<b>Local Grid Location (if applicable)</b> 2130.9 feet <input checked="" type="checkbox"/> N 1331.1 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W

<b>County</b> Milwaukee	<b>DNR County Code</b> 41	<b>Civil Town/City/ or Village</b> City of Milwaukee
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Sample Number and Type	Length Att. & Recovered (ft)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2	GRAVEL, crs., ang., (FILL)	GP (FILL)									
MW-110 (3.5)	23	7	4	2.5'-4' CLAY, brown (10YR 5/3), 5% sand & gravel, firm-soft, moist, no odor (FILL)	CL									
			8	4'-13.5' SAND, lt yellow brown (2.5Y 6/3), prly graded, 10% silt, f., subrnd, loose, wet, no odor	SP									
MW-110 (8.5)	18	25		SILTY SAND										
			14	SAND, trc silt	SP									
			14.5	EOB @ 14.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: *Alvina J. O'Connell* Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.



Project Name <b>GO BULK TERMINAL</b>	Local Grid Location of Well 2130.9 ft. <input type="checkbox"/> N. <input type="checkbox"/> S. 1331.1 ft. <input type="checkbox"/> E. <input type="checkbox"/> W.	Well Name <b>MW-110</b>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N., R. 21 E.</b>	Date Well Installed <b>08/22/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary <b>NA</b> ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input checked="" type="checkbox"/> Not-Known <b>NA</b>	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

A. Protective pipe, top elevation <del>NOT SURVEYED</del> _____ ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <b>736.97</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: <b>5.0</b> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <b>734.5</b> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <b>733.5</b> ft. MSL or <b>1.0</b> ft.	3. Surface seal: Bentonite <input checked="" type="checkbox"/> 30 Concrete <input type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input checked="" type="checkbox"/> SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight . . . . Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite . . . . Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <b>NA</b>	8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 Red Flint Sand</b> b. Volume added _____ ft <sup>3</sup>
17. Sources of water (attach analysis): <b>NA</b>	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top _____ ft. MSL or _____ ft.	10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top _____ ft. MSL or _____ ft.	b. Manufacturer <b>NORTHERN AIRE</b>
G. Filter pack, top <b>731.5</b> ft. MSL or <b>3.0</b> ft.	c. Slot size: <b>0.010</b> in.
H. Screen joint, top <b>731.0</b> ft. MSL or <b>3.5</b> ft.	d. Slotted length: <b>10.0</b> ft.
I. Well bottom <b>721.0</b> ft. MSL or <b>13.5</b> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
J. Filter pack, bottom <b>720.0</b> ft. MSL or <b>14.5</b> ft.	
K. Borehole, bottom <b>720.0</b> ft. MSL or <b>14.5</b> ft.	
L. Borehole, diameter <b>8.2</b> in.	
M. O.D. well casing <b>2.1</b> in.	
N. I.D. well casing <b>1.9</b> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.  
Signature **Stephanie Van Dyke** Firm **NATURAL RESOURCE TECHNOLOGY, INC.**

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>Citgo Bulk Terminal 1096</u>	County Name <u>Milwaukee</u>	Well Name <u>MW-110</u>
Facility License, Permit or Monitoring Number	County Code <u>41</u>	Wis. Unique Well Number
		DNR Well Number

1. Can this well be purged dry?  Yes  No
2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other
3. Time spent developing well 100 min.
4. Depth of well (from top of well casing) 15.67 ft.  
Inside diameter of well 1.9 in.
5. Volume of water in filter pack and well casing 8.4 gal.
7. Volume of water removed from well 70 gal.
8. Volume of water added (if any) 0.0 gal.
9. Source of water added NA
10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>3.51</u> ft.	_____ ft.
Date	b. <u>08/29/95</u> m m d d y y	<u>08/29/95</u> m m d d y y
Time	c. <u>8:30</u> <input checked="" type="checkbox"/> a.m. <input type="checkbox"/> p.m.	_____ : _____ <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	_____ inches	_____ inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + TUBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>TAN</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	_____ mg/l	_____ mg/l
15. COD	_____ mg/l	_____ mg/l

16. Additional comments on development

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>STEPHANIE ANN DYKO / SHELLY BLITTON</u>	Signature: <u>Stephanie Ann Dyko</u>
Firm: <u>NATURAL RESOURCE TECH</u>	Print Initials: <u>S A V</u>
	Firm: <u>NATURAL RESOURCE TECHNOLOGY</u>

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-111	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/24/95		<b>Date Drilling Completed</b> 08/24/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b>		<b>Common Well Name</b> MW-111	
<b>Final Static Water Level</b> 730.30 Feet MSL		<b>Surface Elevation</b> 733.48 Feet MSL		<b>Borehole Diameter</b> 8 inches	
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R21		<b>Feet N</b>  <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 2160.2 feet <input checked="" type="checkbox"/> N 1563.0 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			2	Blind drill to 14' REFERENCE SOIL BORING LOG FOR SB-106.	GP (FILL)									
			4		CL (FILL)									
			6											
			8											
			10		SM									
			12											
			14	EOB @ 14'										
			16											
			18											
			20											
			22											

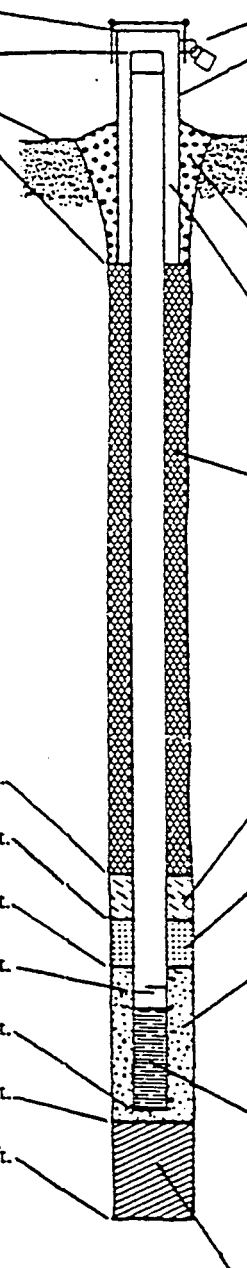
I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature:

Firm: Natural Resource Technology

This form is authorized by Chapters 44.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Project Name <b>TGO BULK TERMINAL</b>		Local Grid Location of Well 2160.2 ft. <input type="checkbox"/> N <input type="checkbox"/> S, 1563.0 ft. <input type="checkbox"/> E <input type="checkbox"/> W		Well Name <b>MW-111</b>	
Facility License, Permit or Monitoring Number		Grid Origin Location		Wis. Unique Well Number DNR Well Number	
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12		St. Plane _____ ft. N. _____ ft. E.		Date Well Installed 08/24/95 m m d d y y	
Distance Well Is From Waste/Source Boundary <b>NA</b> ft.		Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21 E, W.</b>		Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>	
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input checked="" type="checkbox"/> Not Known NA			

<p>A. Protective pipe, top elevation <b>NOT SURVEYED</b> _____ ft. MSL</p> <p>B. Well casing, top elevation <b>736.00</b> ft. MSL</p> <p>C. Land surface elevation <b>733.5</b> ft. MSL</p> <p>D. Surface seal, bottom <b>732.5</b> ft. MSL or <b>1.0</b> ft.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>12. USCS classification of soil near screen:                  GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input type="checkbox"/>                  SM <input checked="" type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/>                  Bedrock <input type="checkbox"/></p> <p>13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>14. Drilling method used: Rotary <input type="checkbox"/> 50                  Hollow Stem Auger <input checked="" type="checkbox"/> 41                  Other <input type="checkbox"/></p> <p>15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01                  Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99</p> <p>16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                  Describe <b>NA</b></p> <p>17. Source of water (attach analysis): <b>NA</b></p> </div> <p>E. Bentonite seal, top _____ ft. MSL or _____ ft.</p> <p>F. Fine sand, top _____ ft. MSL or _____ ft.</p> <p>G. Filter pack, top <b>730.5</b> ft. MSL or <b>30</b> ft.</p> <p>H. Screen joint, top <b>730.0</b> ft. MSL or <b>35</b> ft.</p> <p>I. Well bottom <b>720.0</b> ft. MSL or <b>135</b> ft.</p> <p>J. Filter pack, bottom <b>719.5</b> ft. MSL or <b>140</b> ft.</p> <p>K. Borehole, bottom <b>719.5</b> ft. MSL or <b>140</b> ft.</p> <p>L. Borehole, diameter <b>8.2</b> in.</p> <p>M. O.D. well casing <b>2.1</b> in.</p> <p>    well casing <b>1.9</b> in.</p>	 <p>1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>2. Protective cover pipe:                  a. Inside diameter: _____ in.                  b. Length: <b>5.0</b> ft.                  c. Material: Steel <input checked="" type="checkbox"/> 04                  Other <input type="checkbox"/></p> <p>d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                  If yes, describe: _____</p> <p>3. Surface seal:                  Bentonite <input checked="" type="checkbox"/> 30                  Concrete <input type="checkbox"/> 01                  Other <input type="checkbox"/></p> <p>4. Material between well casing and protective pipe:                  Bentonite <input type="checkbox"/> 30                  Annular space seal <input type="checkbox"/></p> <p>5. Annular space seal:                  a. Granular Bentonite <input checked="" type="checkbox"/> 33                  b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35                  c. _____ Lbs/gal mud weight . . . . Bentonite slurry <input type="checkbox"/> 31                  d. _____ % Bentonite . . . . Bentonite-cement grout <input type="checkbox"/> 50                  e. _____ Ft<sup>3</sup> volume added for any of the above                  f. How installed: Tremie <input type="checkbox"/> 01                  Tremie pumped <input type="checkbox"/> 02                  Gravity <input checked="" type="checkbox"/> 08</p> <p>6. Bentonite seal:                  a. Bentonite granules <input type="checkbox"/> 33                  b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32                  c. _____ Other <input type="checkbox"/></p> <p>7. Fine sand material: Manufacturer, product name &amp; mesh size                  a. _____                  b. Volume added _____ ft<sup>3</sup></p> <p>8. Filter pack material: Manufacturer, product name and mesh size                  a. <b>#30 Red Flint Sand</b>                  b. Volume added _____ ft<sup>3</sup></p> <p>9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23                  Flush threaded PVC schedule 80 <input type="checkbox"/> 24                  Other <input type="checkbox"/></p> <p>10. Screen material: <b>PVC</b>                  a. Screen type: Factory cut <input checked="" type="checkbox"/> 11                  Continuous slot <input type="checkbox"/> 01                  Other <input type="checkbox"/>                  b. Manufacturer <b>NORTHERN AIR</b>                  c. Slot size: <b>0.010</b> in.                  d. Slotted length: <b>14.0</b> ft.</p> <p>11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14                  Other <input type="checkbox"/></p>
--	---

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature Stephanie Van Dyle Firm NATURAL RESOURCE TECHNOLOGY, INC.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO Bulk Terminal 10910</u>	County Name <u>Milwaukee</u>	Well Name <u>MW-111</u>
Facility License, Permit or Monitoring Number -----	County Code <u>41</u>	Wis. Unique Well Number -----
		DNR Well Number -----

1. Can this well be purged dry?  Yes  No
2. Well development method
- surged with bailer and bailed  41
  - surged with bailer and pumped  61
  - surged with block and bailed  42
  - surged with block and pumped  62
  - surged with block, bailed and pumped  70
  - compressed air  20
  - bailed only  10
  - pumped only  51
  - pumped slowly  50
  - Other

3. Time spent developing well 60 min.
4. Depth of well (from top of well casing) 15.12 ft.
- Inside diameter of well 1.9 in.
6. Volume of water in filter pack and well casing 6.4 gal.
7. Volume of water removed from well 70.0 gal.
8. Volume of water added (if any) 0.0 gal.
9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>5.86</u> ft.	----- ft.
Date	b. <u>8/25/95</u> m m d d y y	<u>08/25/95</u> m m d d y y
Time	c. <u>4:00</u> <input type="checkbox"/> a.m. <input checked="" type="checkbox"/> p.m.	---:--- <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	----- inches	----- inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>TAN + TURBID</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>TAN</u>

Fill in if drilling fluids were used and well is at solid waste facility:

14. Total suspended solids	----- mg/l	----- mg/l
15. COD	----- mg/l	----- mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm

Name: STEPHANIE VAN DYKE / SHARON BRITTON

Firm: NATURAL RESOURCE TECH

I hereby certify that the above information is true and correct to the best of my knowledge.

Signature: Stephanie Van Dyke

Print Initials: S A V

Firm: NATURAL RESOURCE TECHNOLOGY

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.

- Route To:
- Solid Waste
  - Emergency Response
  - Wastewater
  - Superfund
  - Haz. Waste
  - Underground Tanks
  - Water Resources
  - Other:

<b>Project Name</b> Citgo Bulk Terminal/Site Investigation (1096)		<b>License/Permit/Monitoring Number</b>		<b>Boring Number</b> MW-112	
<b>Boring Drilled By</b> (Firm name and name of crew chief) Midwest Engineering Services		<b>Date Drilling Started</b> 08/17/95		<b>Date Drilling Completed</b> 08/17/95	
<b>DNR Facility Well No.</b>		<b>WI Unique Well No.</b> MW-112		<b>Common Well Name</b>	
<b>Final Static Water Level</b> 729.04 Feet MSL		<b>Surface Elevation</b> 733.09 Feet MSL		<b>Borehole Diameter</b> 8 inches	
<b>Boring Location</b> State Plane SE 1/4 of NE 1/4 of Section 6, T8N, R 21		<b>Feet N</b> <b>Feet E</b>		<b>Local Grid Location (if applicable)</b> 1988.4 feet <input checked="" type="checkbox"/> N 1742.3 feet <input checked="" type="checkbox"/> E <input type="checkbox"/> S <input type="checkbox"/> W	
<b>County</b> Milwaukee		<b>DNR County Code</b> 41		<b>Civil Town/City/ or Village</b> City of Milwaukee	

Sample Number and Type	Length Att. & Recovered (in)	Blow Counts	Depth in Feet	Soil/Rock Description And Geologic Origin For Each Major Unit	USCS	Graphic Log	Well Diagram	PID/FID	Soil Properties					RQD/ Comments
									Compressive Strength	Moisture Content	Liquid Limit	Plasticity Index	P 200	
			0-2	ASPHALT W/ GRAVEL SUBGRADE (FILL)	ASPH GP (FILL)									
MW112 (3.5)	49	15	2-4	2.5'-4.5' SILTY CLAY, pale brown (10YR 6/3), med. plast., firm, trc f. gravel, moist, no odor, (FILL)	CL (FILL)			94						
SB105 (8.5)	23	10	6-8	6.5'-8.5' SAND, lt brownish gray (2.5Y 6/2), prly graded, 5% silt, f., subrnd, compact, wet, no odor	SP			61						
SB105 (13.5)	18	34	12-14					97						
			14-16	EOB @ 14.5'										

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature: Firm: Natural Resource Technology

This form is authorized by Chapters 144.147 and 162, Wis. Stats. Completion of this report is mandatory. Penalties: Forfeit not less than \$10 nor more than \$5,000 for each violation. Fined not less than \$10 or more than \$100 or imprisoned not less than 30 days, or both for each violation. Each day of continued violation is a separate offense, pursuant to ss 144.99 and 162.06, Wis. Stats.

Project Name <b>1760 BULK TERMINAL</b>	Local Grid Location of Well 1988.4 ft. <input checked="" type="checkbox"/> N. 1742.3 ft. <input checked="" type="checkbox"/> E. <input type="checkbox"/> S. <input type="checkbox"/> W.	Well Name <b>MW-112</b>
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number _____ DNR Well Number _____
Type of Well Water Table Observation Well <input checked="" type="checkbox"/> 11 Piezometer <input type="checkbox"/> 12	Section Location of Waste/Source <b>SE 1/4 of NE 1/4 of Sec. 6, T. 8 N, R. 21</b> <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.	Date Well Installed <b>08/17/95</b> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u <input checked="" type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) <b>MIDWEST ENGINEERING</b>
Is Well A Point of Enforcement Std. Application? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

A. Protective pipe, top elevation <b>732.62</b> ft. MSL	1. Cap and lock? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
B. Well casing, top elevation <b>732.62</b> ft. MSL	2. Protective cover pipe: a. Inside diameter: _____ in. b. Length: <b>1.0</b> ft. c. Material: Steel <input checked="" type="checkbox"/> 04 Other <input type="checkbox"/>
C. Land surface elevation <b>733.1</b> ft. MSL	d. Additional protection? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe: _____
D. Surface seal, bottom <b>732.1</b> ft. MSL or <b>1.0</b> ft.	3. Surface seal: Bentonite <input type="checkbox"/> 30 Concrete <input checked="" type="checkbox"/> 01 Other <input type="checkbox"/>
12. USCS classification of soil near screen: GP <input type="checkbox"/> GM <input type="checkbox"/> GC <input type="checkbox"/> GW <input type="checkbox"/> SW <input type="checkbox"/> SP <input checked="" type="checkbox"/> SM <input type="checkbox"/> SC <input type="checkbox"/> ML <input type="checkbox"/> MH <input type="checkbox"/> CL <input checked="" type="checkbox"/> CH <input type="checkbox"/> Bedrock <input type="checkbox"/>	4. Material between well casing and protective pipe: Bentonite <input type="checkbox"/> 30 Annular space seal <input type="checkbox"/> Other <input type="checkbox"/>
13. Sieve analysis attached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. Annular space seal: a. Granular Bentonite <input checked="" type="checkbox"/> 33 b. _____ Lbs/gal mud weight . . . Bentonite-sand slurry <input type="checkbox"/> 35 c. _____ Lbs/gal mud weight . . . . . Bentonite slurry <input type="checkbox"/> 31 d. _____ % Bentonite . . . . . Bentonite-cement grout <input type="checkbox"/> 50 e. _____ Ft <sup>3</sup> volume added for any of the above f. How installed: Tremie <input type="checkbox"/> 01 Tremie pumped <input type="checkbox"/> 02 Gravity <input checked="" type="checkbox"/> 08
14. Drilling method used: Rotary <input type="checkbox"/> 50 Hollow Stem Auger <input checked="" type="checkbox"/> 41 Other <input type="checkbox"/>	6. Bentonite seal: a. Bentonite granules <input type="checkbox"/> 33 b. <input type="checkbox"/> 1/4 in. <input type="checkbox"/> 3/8 in. <input type="checkbox"/> 1/2 in. Bentonite pellets <input type="checkbox"/> 32 c. _____ Other <input type="checkbox"/>
15. Drilling fluid used: Water <input type="checkbox"/> 02 Air <input type="checkbox"/> 01 Drilling Mud <input type="checkbox"/> 03 None <input checked="" type="checkbox"/> 99	7. Fine sand material: Manufacturer, product name & mesh size a. _____ b. Volume added _____ ft <sup>3</sup>
16. Drilling additives used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Describe <b>NA</b>	8. Filter pack material: Manufacturer, product name and mesh size a. <b>#30 Red Flint Sand</b> b. Volume added _____ ft <sup>3</sup>
17. Source of water (attach analysis): <b>NA</b>	9. Well casing: Flush threaded PVC schedule 40 <input checked="" type="checkbox"/> 23 Flush threaded PVC schedule 80 <input type="checkbox"/> 24 Other <input type="checkbox"/>
E. Bentonite seal, top _____ ft. MSL or _____ ft.	10. Screen material: <b>PVC</b> a. Screen type: Factory cut <input checked="" type="checkbox"/> 11 Continuous slot <input type="checkbox"/> 01 Other <input type="checkbox"/>
F. Fine sand, top _____ ft. MSL or _____ ft.	b. Manufacturer <b>NORTHERN AIRE</b>
G. Filter pack, top <b>730.1</b> ft. MSL or <b>3.0</b> ft.	c. Slot size: <b>0.010</b> in.
H. Screen joint, top <b>729.6</b> ft. MSL or <b>3.5</b> ft.	d. Slotted length: <b>10.9</b> ft.
I. Well bottom <b>719.6</b> ft. MSL or <b>13.5</b> ft.	11. Backfill material (below filter pack): None <input checked="" type="checkbox"/> 14 Other <input type="checkbox"/>
J. Filter pack, bottom <b>718.6</b> ft. MSL or <b>14.5</b> ft.	
K. Borehole, bottom <b>718.6</b> ft. MSL or <b>14.5</b> ft.	
L. Borehole, diameter <b>8.2</b> in.	
M. O.D. well casing <b>2.1</b> in.	
D. well casing <b>1.9</b> in.	

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature **Stephanie LaDyke** Firm **NATURAL RESOURCE TECHNOLOGY, INC.**

Please complete both sides of this form and return to the appropriate DNR office listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stats., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis. Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stats., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation.

Route to: Solid Waste  Haz. Waste  Wastewater   
Env. Response & Repair  Underground Tanks  Other

Facility/Project Name <u>CITGO Bulk Fuel Disp.</u>	County Name <u>Milwaukee</u>	Well Name <u>MW-112</u>
Facility License, Permit or Monitoring Number -----	County Code <u>41</u>	Wis. Unique Well Number -----
		DNR Well Number -----

1. Can this well be purged dry?  Yes  No

2. Well development method

surged with bailer and bailed	<input type="checkbox"/>	41
surged with bailer and pumped	<input checked="" type="checkbox"/>	61
surged with block and bailed	<input type="checkbox"/>	42
surged with block and pumped	<input type="checkbox"/>	62
surged with block, bailed and pumped	<input type="checkbox"/>	70
compressed air	<input type="checkbox"/>	20
bailed only	<input type="checkbox"/>	10
pumped only	<input type="checkbox"/>	51
pumped slowly	<input type="checkbox"/>	50
Other	<input type="checkbox"/>	-----

3. Time spent developing well 60 min.

4. Depth of well (from top of well casing) 13.4 ft.

inside diameter of well 1.9 in.

5. Volume of water in filter pack and well casing 6.7 gal.

7. Volume of water removed from well 75 gal.

8. Volume of water added (if any) 0.0 gal.

9. Source of water added NA

10. Analysis performed on water added? NA  Yes  No  
(If yes, attach results)

	Before Development	After Development
11. Depth to Water (from top of well casing)	a. <u>3.64</u> ft.	----- ft.
Date	b. <u>08/28/95</u> m m d d y y	<u>08/28/95</u> m m d d y y
Time	c. ----- : ----- <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	----- : ----- <input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
12. Sediment in well bottom	----- inches	----- inches
13. Water clarity	Clear <input type="checkbox"/> 10 Turbid <input checked="" type="checkbox"/> 15 (Describe) <u>SILTY</u>	Clear <input type="checkbox"/> 20 Turbid <input checked="" type="checkbox"/> 25 (Describe) <u>SILTY</u>
Fill in if drilling fluids were used and well is at solid waste facility:		
14. Total suspended solids	----- mg/l	----- mg/l
15. COD	----- mg/l	----- mg/l

16. Additional comments on development:

Well developed by: Person's Name and Firm	I hereby certify that the above information is true and correct to the best of my knowledge.
Name: <u>STEPHANIE VAN DYKE / SHERLY BRITTO</u>	Signature: <u>Stephanie Van Dyke</u>
Firm: <u>NATURAL RESOURCE TECH</u>	Print Initials: <u>S A V</u>
	Firm: <u>NATURAL RESOURCE TECHNOLOGY</u>

NOTE: Shaded areas are for DNR use only. See instructions for more information including a list of county codes.



**APPENDIX F**  
**GROUNDWATER ANALYTICAL REPORTS**



Received 3:10 pm (CST)

LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4776

F A X T R A N S M I S S I O N

MEMO FROM: JOHN TROOST

COMPANY: SPL, INC - SCOTT, LA (LAFAYETTE AREA)

FAX #: (318) 237-7080

PHONE #: (318) 237-4775

NUMBER OF PAGES TO FOLLOW: 13

DATE: 09/06/95

MEMO TO: ~~SCOTT BUCKNER~~ *Tim Mueller*

COMPANY: CITGO

FAX #: ~~708-437-3578~~ *44-523-9001*

REFERENCE: LAB# 95-08-C04  
CITGO MILWAUKEE TERMINAL  
1096  
MILWAUKEE, WI/9235 N 107 ST.

COMMENTS: RESULTS ATTACHED FOR THIS WORK ORDER - ~~ALL BUT~~ *Remaining*

PAH'S ~~THAT~~ ARE EXPECTED 9/7....

This transmission may contain confidential information. Reading, copying, or distribution of this material is forbidden without the permission of the person to whom this transmission is intended. If you have received this transmission in error, please call SPL to arrange for the return of this transmission at our expense.



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-01

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-109

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER	ND	8 P	µg/L
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
1,3,5 - TRIMETHYLBENZENE	ND	1 P	µg/L
1,2,4 - TRIMETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L

Surrogate  
4-Bromofluorobenzene  
Method 8020  
Analyzed by: TB  
Date: 08/31/95


% Recovery  
96

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-03

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: PZ-102

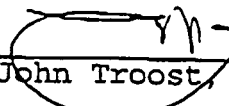
PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA			UNITS
	RESULTS	DETECTION LIMIT		
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/30/95 11:04:00	ND	0.1		mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 09/02/95 02:23:00	0.2	0.1		mg/L
Lead, Total Method 239.2 * Analyzed by: EH Date: 09/05/95 08:35:00	ND	0.001		mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

## Certificate of Analysis No. L1-9508C04-03

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: PZ-102

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

## ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	ND	0.7	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	ND	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

## Certificate of Analysis No. L1-9508C04-03

CITGO PETROLEUM CORPORATION

SAMPLE ID: PZ-102

## ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
sec-Butylbenzene	ND	0.2	µg/L
p-Isopropyltoluene	ND	0.1	µg/L
1,3-Dichlorobenzene	ND	3.2	µg/L
1,4-Dichlorobenzene	ND	2.4	µg/L
n-Butylbenzene	ND	0.2	µg/L
1,2-Dichlorobenzene	ND	1.5	µg/L
1,2-Dibromo-3-chloropropane	ND	30	µg/L
1,2,4-Trichlorobenzene	ND	0.3	µg/L
Hexachlorobutadiene	ND	0.2	µg/L
Naphthalene	ND	0.6	µg/L
1,2,3-Trichlorobenzene	ND	0.2	µg/L
Di-isopropyl ether	ND	1.0	µg/L
Methyl-t-butyl ether	ND	8.0	µg/L

SURROGATES  
Fluorobenzene

% RECOVERY  
104

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]


NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

## Certificate of Analysis No. L1-9508C04-04

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-112

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

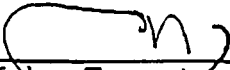
## ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/30/95 11:04:00	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 09/02/95 03:10:00	ND	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: EH Date: 09/05/95 08:35:00	ND	0.001	mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

## Certificate of Analysis No. L1-9508C04-04

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-112

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA			UNITS
	RESULTS	PQL*		
Dichlorodifluoromethane	ND	2.9	µg/L	
Chloromethane	ND	0.8	µg/L	
Vinyl chloride	ND	1.8	µg/L	
Chloroethane	ND	5.2	µg/L	
Trichlorofluoromethane	ND	1.0	µg/L	
1,1-Dichloroethene	ND	1.3	µg/L	
Methylene Chloride	ND	0.8	µg/L	
trans-1,2-Dichloroethene	ND	1.0	µg/L	
1,1-Dichloroethane	ND	0.7	µg/L	
2,2-Dichloropropane	ND	0.5	µg/L	
cis-1,2-Dichloroethene	ND	0.1	µg/L	
Chloroform	ND	0.5	µg/L	
1,1,1-Trichloroethane	ND	0.3	µg/L	
Carbon Tetrachloride	ND	1.2	µg/L	
Benzene	ND	2.0	µg/L	
1,2-Dichloroethane	ND	0.3	µg/L	
Trichloroethene	ND	1.2	µg/L	
1,2-Dichloropropane	ND	0.4	µg/L	
Bromodichloromethane	ND	1.0	µg/L	
Toluene	ND	2.0	µg/L	
1,1,2-Trichloroethane	ND	0.2	µg/L	
Tetrachloroethene	ND	0.3	µg/L	
1,3-Dichloropropane	ND	0.3	µg/L	
Dibromochloromethane	ND	0.9	µg/L	
1,2-Dibromoethane	ND	0.8	µg/L	
Chlorobenzene	ND	2.5	µg/L	
Ethyl benzene	ND	2.0	µg/L	
M and P Xylene	ND	2.0	µg/L	
O-Xylene	ND	2.0	µg/L	
Isopropylbenzene	ND	2.0	µg/L	
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L	
n-Propyl benzene	ND	0.1	µg/L	
Bromobenzene	ND	0.3	µg/L	
1,3,5-Trimethylbenzene	ND	0.2	µg/L	
2-Chlorotoluene	ND	0.1	µg/L	
4-Chlorotoluene	ND	0.2	µg/L	
tert-Butylbenzene	ND	0.6	µg/L	
1,2,4-Trimethylbenzene	ND	0.5	µg/L	

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

## Certificate of Analysis No. L1-9508C04-04

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-112

PARAMETER	ANALYTICAL DATA (continued)			UNITS
	RESULTS	PQL*		
sec-Butylbenzene	ND	0.2	µg/L	
p-Isopropyltoluene	ND	0.1	µg/L	
1,3-Dichlorobenzene	ND	3.2	µg/L	
1,4-Dichlorobenzene	ND	2.4	µg/L	
n-Butylbenzene	ND	0.2	µg/L	
1,2-Dichlorobenzene	ND	1.5	µg/L	
1,2-Dibromo-3-chloropropane	ND	30	µg/L	
1,2,4-Trichlorobenzene	ND	0.3	µg/L	
Hexachlorobutadiene	ND	0.2	µg/L	
Naphthalene	ND	0.6	µg/L	
1,2,3-Trichlorobenzene	ND	0.2	µg/L	
Di-isopropyl ether	ND	1.0	µg/L	
Methyl-t-butyl ether	ND	8.0	µg/L	
<b>SURROGATES</b>		<b>% RECOVERY</b>		
Fluorobenzene		104		

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]


NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-05

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-106

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/29/95  
DATE RECEIVED: 08/30/95

ANALYTICAL DATA

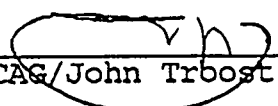
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER	ND	8 P	µg/L
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
1,3,5 - TRIMETHYLBENZENE	ND	1 P	µg/L
1,2,4 - TRIMETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L

Surrogate  
4-Bromofluorobenzene  
Method 8020  
Analyzed by: TB  
Date: 08/31/95  
% Recovery  
96

ND - Not detected. (P) - Practical Quantitation Limit

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager







LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508C04-08

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-110

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/29/95  
DATE RECEIVED: 08/30/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
METHYL T-BUTYL ETHER	ND	8 P	µg/L
BENZENE	ND	1 P	µg/L
TOLUENE	ND	1 P	µg/L
ETHYLBENZENE	ND	1 P	µg/L
1,3,5 - TRIMETHYLBENZENE	ND	1 P	µg/L
1,2,4 - TRIMETHYLBENZENE	ND	1 P	µg/L
TOTAL XYLENE	ND	1 P	µg/L

Surrogate

4-Bromofluorobenzene

% Recovery  
100

Method 8020

Analyzed by: TB

Date: 08/31/95

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

## Certificate of Analysis No. L1-9508C04-11

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 09/06/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-DD

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/29/95  
DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA			UNITS
	RESULTS	DETECTION LIMIT		
METHYL T-BUTYL ETHER	ND	8 P		μg/L
BENZENE	ND	1 P		μg/L
TOLUENE	ND	1 P		μg/L
ETHYLBENZENE	ND	1 P		μg/L
1,3,5 - TRIMETHYLBENZENE	ND	1 P		μg/L
1,2,4 - TRIMETHYLBENZENE	ND	1 P		μg/L
TOTAL XYLENE	ND	1 P		μg/L
Surrogate				
4-Bromofluorobenzene	% Recovery			
Method 8020	96			
Analyzed by: TB				
Date: 08/31/95				

ND - Not detected.

(P) - Practical Quantitation Limit

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager

F A X T R A N S M I S S I O N

MEMO FROM: JOHN TROOST

COMPANY: SPL, INC - SCOTT, LA (LAFAYETTE AREA)

FAX #: (318) 237-7080

PHONE #: (318) 237-4775

NUMBER OF PAGES TO FOLLOW: 9

DATE: 09/07/95

MEMO TO: TIM MUELLER

COMPANY: NATIONAL RESOURCE TECHNOLOGY

FAX #: 414-523-9001

REFERENCE: LAB# 95-08-C04  
CITGO MILWAUKEE TERMINAL  
1096  
MILWAUKEE, WI/9235 N 107 ST.

COMMENTS: REMAINING PAH's TO COMPLETE THIS WORK ORDER.OUR APOLOGIES FOR DELAY...  

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## Certificate of Analysis No. L1-9508C04-01

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-109

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

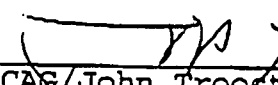
PARAMETER	ANALYTICAL DATA			UNITS
	RESULTS	MDL*		
Naphthalene	ND	0.100		µg/L
Acenaphthylene	ND	0.020		µg/L
Acenaphthene	ND	0.020		µg/L
Fluorene	ND	0.020		µg/L
Phenanthrene	ND	0.020		µg/L
Anthracene	ND	0.010		µg/L
Fluoranthene	ND	0.010		µg/L
Pyrene	ND	0.010		µg/L
Chrysene	ND	0.007		µg/L
Benzo (a) anthracene	ND	0.002		µg/L
Benzo (b) fluoranthene	ND	0.003		µg/L
Benzo (k) fluoranthene	ND	0.002		µg/L
Benzo (a) pyrene	ND	0.008		µg/L
Dibenzo (a,h) anthracene	ND	0.006		µg/L
Benzo (g,h,i) perylene	ND	0.010		µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006		µg/L
1-Methylnaphthalene	ND	0.100		µg/L
2-Methylnaphthalene	ND	0.100		µg/L
<b>SURROGATES</b>		<b>% RECOVERY</b>		
9,10-Diphenylanthracene		76		

ANALYZED BY: SJ  
EXTRACTED BY: SN  
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
NOTES: \* - Method Detection Limit  
NA - Not Analyzed

DATE/TIME: 09/06/95 21:23:00  
DATE/TIME: 09/01/95 15:00:00  
ND - Not Detected

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager

## Certificate of Analysis No. L1-9508C04-02

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-111

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

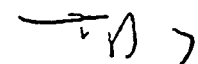
## ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	µg/L
Acenaphthylene	ND	0.020	µg/L
Acenaphthene	ND	0.020	µg/L
Fluorene	ND	0.020	µg/L
Phenanthrene	ND	0.020	µg/L
Anthracene	ND	0.010	µg/L
Fluoranthene	ND	0.010	µg/L
Pyrene	ND	0.010	µg/L
Chrysene	ND	0.007	µg/L
Benzo (a) anthracene	ND	0.002	µg/L
Benzo (b) fluoranthene	ND	0.003	µg/L
Benzo (k) fluoranthene	ND	0.002	µg/L
Benzo (a) pyrene	ND	0.008	µg/L
Dibenzo (a,h) anthracene	ND	0.006	µg/L
Benzo (g,h,i) perylene	ND	0.010	µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L
1-Methylnaphthalene	ND	0.100	µg/L
2-Methylnaphthalene	ND	0.100	µg/L
SURROGATES		% RECOVERY	
9,10-Diphenylanthracene		53	

ANALYZED BY: SJ DATE/TIME: 09/01/95 13:30:05  
EXTRACTED BY: SN DATE/TIME: 08/31/95 17:00:00  
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
NOTES: \* - Method Detection Limit ND - Not Detected  
NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager

## Certificate of Analysis No. L1-9508C04-03

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: PZ-102

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA			UNITS
	RESULTS	MDL*		
Naphthalene	ND	0.100		µg/L
Acenaphthylene	ND	0.020		µg/L
Acenaphthene	ND	0.020		µg/L
Fluorene	ND	0.020		µg/L
Phenanthrene	ND	0.020		µg/L
Anthracene	ND	0.010		µg/L
Fluoranthene	ND	0.010		µg/L
Pyrene	ND	0.010		µg/L
Chrysene	ND	0.007		µg/L
Benzo (a) anthracene	ND	0.002		µg/L
Benzo (b) fluoranthene	ND	0.003		µg/L
Benzo (k) fluoranthene	ND	0.002		µg/L
Benzo (a) pyrene	ND	0.008		µg/L
Dibenzo (a,h) anthracene	ND	0.006		µg/L
Benzo (g,h,i) perylene	ND	0.010		µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006		µg/L
1-Methylnaphthalene	ND	0.100		µg/L
2-Methylnaphthalene	ND	0.100		µg/L
<b>SURROGATES</b>		<b>% RECOVERY</b>		
9,10-Diphenylanthracene		92		

ANALYZED BY: SJ DATE/TIME: 09/06/95 21:23:00  
EXTRACTED BY: SN DATE/TIME: 09/01/95 15:00:00  
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
NOTES: \* - Method Detection Limit ND - Not Detected  
NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines.. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager

## Certificate of Analysis No. L1-9508C04-04

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-112

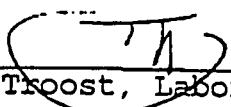
PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/28/95  
DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA			UNITS
	RESULTS	MDL*		
Naphthalene	ND	0.100	µg/L	
Acenaphthylene	ND	0.020	µg/L	
Acenaphthene	ND	0.020	µg/L	
Fluorene	ND	0.020	µg/L	
Phenanthrene	ND	0.020	µg/L	
Anthracene	ND	0.010	µg/L	
Fluoranthene	ND	0.010	µg/L	
Pyrene	ND	0.010	µg/L	
Chrysene	ND	0.007	µg/L	
Benzo (a) anthracene	ND	0.002	µg/L	
Benzo (b) fluoranthene	ND	0.003	µg/L	
Benzo (k) fluoranthene	ND	0.002	µg/L	
Benzo (a) pyrene	ND	0.008	µg/L	
Dibenzo (a,h) anthracene	ND	0.006	µg/L	
Benzo (g,h,i) perylene	ND	0.010	µg/L	
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L	
1-Methylnaphthalene	ND	0.100	µg/L	
2-Methylnaphthalene	ND	0.100	µg/L	
<b>SURROGATES</b>		<b>% RECOVERY</b>		
9,10-Diphenylanthracene		85		

ANALYZED BY: SJ  
EXTRACTED BY: SN  
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
NOTES: \* - Method Detection Limit ND - Not Detected  
NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager

## Certificate of Analysis No. L1-9508C04-05

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-106

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/29/95  
DATE RECEIVED: 08/30/95

PARAMETER	ANALYTICAL DATA			UNITS
	RESULTS	MDL*		
Naphthalene	ND	0.100	µg/L	
Acenaphthylene	ND	0.020	µg/L	
Acenaphthene	ND	0.020	µg/L	
Fluorene	ND	0.020	µg/L	
Phenanthrene	ND	0.020	µg/L	
Anthracene	ND	0.010	µg/L	
Fluoranthene	ND	0.010	µg/L	
Pyrene	ND	0.010	µg/L	
Chrysene	ND	0.007	µg/L	
Benzo (a) anthracene	ND	0.002	µg/L	
Benzo (b) fluoranthene	ND	0.003	µg/L	
Benzo (k) fluoranthene	ND	0.002	µg/L	
Benzo (a) pyrene	ND	0.008	µg/L	
Dibenzo (a,h) anthracene	ND	0.006	µg/L	
Benzo (g,h,i) perylene	ND	0.010	µg/L	
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L	
1-Methylnaphthalene	ND	0.100	µg/L	
2-Methylnaphthalene	ND	0.100	µg/L	
<b>SURROGATES</b>		<b>% RECOVERY</b>		
9,10-Diphenylanthracene		71		

ANALYZED BY: SJ DATE/TIME: 09/06/95 21:23:00  
EXTRACTED BY: SN DATE/TIME: 09/01/95 15:00:00  
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
NOTES: \* - Method Detection Limit ND - Not Detected  
NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager

## Certificate of Analysis No. L1-9508C04-06

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-107

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/29/95  
DATE RECEIVED: 08/30/95

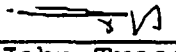
## ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	µg/L
Acenaphthylene	ND	0.020	µg/L
Acenaphthene	ND	0.020	µg/L
Fluorene	ND	0.020	µg/L
Phenanthrene	ND	0.020	µg/L
Anthracene	ND	0.010	µg/L
Fluoranthene	ND	0.010	µg/L
Pyrene	ND	0.010	µg/L
Chrysene	ND	0.007	µg/L
Benzo (a) anthracene	ND	0.002	µg/L
Benzo (b) fluoranthene	ND	0.003	µg/L
Benzo (k) fluoranthene	ND	0.002	µg/L
Benzo (a) pyrene	ND	0.008	µg/L
Dibenzo (a,h) anthracene	ND	0.006	µg/L
Benzo (g,h,i) perylene	ND	0.010	µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L
1-Methylnaphthalene	ND	0.100	µg/L
2-Methylnaphthalene	ND	0.100	µg/L
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Biphenyl	0		
Decafluorobiphenyl	0		
Coronene	0		
9,10-Diphenylanthracene	58		

ANALYZED BY: SJ DATE/TIME: 09/06/95 21:23:00  
EXTRACTED BY: SN DATE/TIME: 09/01/95 15:00:00  
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
NOTES: \* - Method Detection Limit ND - Not Detected  
NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager

## Certificate of Analysis No. L1-9508C04-07

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-108

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/29/95  
DATE RECEIVED: 08/30/95

## ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	µg/L
Acenaphthylene	ND	0.020	µg/L
Acenaphthene	ND	0.020	µg/L
Fluorene	ND	0.020	µg/L
Phenanthrene	ND	0.020	µg/L
Anthracene	ND	0.010	µg/L
Fluoranthene	ND	0.010	µg/L
Pyrene	ND	0.010	µg/L
Chrysene	ND	0.007	µg/L
Benzo (a) anthracene	ND	0.002	µg/L
Benzo (b) fluoranthene	ND	0.003	µg/L
Benzo (k) fluoranthene	ND	0.002	µg/L
Benzo (a) pyrene	ND	0.008	µg/L
Dibenzo (a,h) anthracene	ND	0.006	µg/L
Benzo (g,h,i) perylene	ND	0.010	µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L
1-Methylnaphthalene	ND	0.100	µg/L
2-Methylnaphthalene	ND	0.100	µg/L
<b>SURROGATES</b>	<b>% RECOVERY</b>		
9,10-Diphenylanthracene	36		

ANALYZED BY: SJ

DATE/TIME: 09/01/95 13:30:05

EXTRACTED BY: SN

DATE/TIME: 08/31/95 17:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons


NOTES: \* - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager

## Certificate of Analysis No. L1-9508C04-08

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECH.  
SAMPLE ID: MW-110

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/29/95  
DATE RECEIVED: 08/30/95

## ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	µg/L
Acenaphthylene	ND	0.020	µg/L
Acenaphthene	ND	0.020	µg/L
Fluorene	ND	0.020	µg/L
Phenanthrene	1	0.020	µg/L
Anthracene	0.08	0.010	µg/L
Fluoranthene	ND	0.010	µg/L
Pyrene	ND	0.010	µg/L
Chrysene	0.03	0.007	µg/L
Benzo (a) anthracene	0.03	0.002	µg/L
Benzo (b) fluoranthene	ND	0.003	µg/L
Benzo (k) fluoranthene	ND	0.002	µg/L
Benzo (a) pyrene	ND	0.008	µg/L
Dibenzo (a,h) anthracene	ND	0.006	µg/L
Benzo (g,h,i) perylene	ND	0.010	µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L
1-Methylnaphthalene	ND	0.100	µg/L
2-Methylnaphthalene	ND	0.100	µg/L

## SURROGATES

9,10-Diphenylanthracene

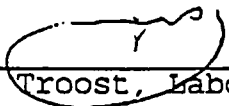
## % RECOVERY

42

ANALYZED BY: SJ DATE/TIME: 09/01/95 13:30:05  
EXTRACTED BY: SN DATE/TIME: 08/31/95 17:00:00  
METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
NOTES: \* - Method Detection Limit ND - Not Detected  
NA - Not Analyzed

## COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager



Certificate of Analysis No. L1-9508C04-11

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BÜCKNER

P.O.#  
 #2642, TYPE WC  
 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECH.  
 SAMPLE ID: MW-DD

PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/29/95  
 DATE RECEIVED: 08/30/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	µg/L
Acenaphthylene	ND	0.020	µg/L
Acenaphthene	ND	0.020	µg/L
Fluorene	ND	0.020	µg/L
Phenanthrene	ND	0.020	µg/L
Anthracene	ND	0.010	µg/L
Fluoranthene	ND	0.010	µg/L
Pyrene	ND	0.010	µg/L
Chrysene	ND	0.007	µg/L
Benzo (a) anthracene	ND	0.002	µg/L
Benzo (b) fluoranthene	ND	0.003	µg/L
Benzo (k) fluoranthene	ND	0.002	µg/L
Benzo (a) pyrene	ND	0.008	µg/L
Dibenzo (a,h) anthracene	ND	0.006	µg/L
Benzo (g,h,i) perylene	ND	0.010	µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L
1-Methylnaphthalene	ND	0.100	µg/L
2-Methylnaphthalene	ND	0.100	µg/L

SURROGATES

9,10-Diphenylanthracene


% RECOVERY

39

ANALYZED BY: SJ DATE/TIME: 09/01/95 13:30:05  
 EXTRACTED BY: SN DATE/TIME: 08/31/95 17:00:00  
 METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons  
 NOTES: \* - Method Detection Limit ND - Not Detected  
 NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

\*\*\*SUMMARY REPORT\*\*\*

09/07/95

Company: CITGO PETROLEUM CORPORATION  
 Site: MILWAUKEE, WI/9235 N 107 ST.  
 Project No: 1096  
 Project: CITGO MILWAUKEE TERMINAL

ANALYTICAL DATA  
 NOTE: ND - Not Detected

SPL ID MATRIX	CLIENT ID DATE SAMPLED	BENZENE	TOLUENE	ETHYLBENZ.	XYLENE	TPH-IR	TPH-GC MDL	LEAD MDL	MTBE
9508A65-07 WATER	PZ-101 08/25/95						0.5 0.1mg/L	ND 0.001mg/L	
9508A65-08 WATER	MW-101 08/25/95						0.5 0.1mg/L	ND 0.001mg/L	
9508A65-09 WATER	MW-104 08/25/95						0.6 0.1mg/L	ND 0.001mg/L	
9508A65-10 WATER	MW-102 08/25/95						0.4 0.1mg/L	ND 0.001mg/L	
9508A65-11 WATER	MW-103 08/25/95						0.6 0.1mg/L	ND 0.001mg/L	
9508A65-12 WATER	MW-105 08/25/95						0.4 0.1mg/L	ND 0.001mg/L	
9508A65-13 WATER	MW-ZZ 08/25/95						0.6 0.1mg/L	ND 0.001mg/L	

TPH-GC - WI LUST DRO #  
 LEAD - Method 239.2 \*



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-07

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: PZ-101

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95


ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	0.2	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 02:25:00	0.5	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
\*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
\*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
# LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager



Certificate of Analysis No. L1-9508A65-07

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: PZ-101

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	46	1.0	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	15	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	55	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



Certificate of Analysis No. L1-9508A65-07

CITGO PETROLEUM CORPORATION

SAMPLE ID: PZ-101

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	PQL*	
sec-Butylbenzene	ND	0.2	µg/L
p-Isopropyltoluene	ND	0.1	µg/L
1,3-Dichlorobenzene	ND	3.2	µg/L
1,4-Dichlorobenzene	ND	2.4	µg/L
n-Butylbenzene	ND	0.2	µg/L
1,2-Dichlorobenzene	ND	1.5	µg/L
1,2-Dibromo-3-chloropropane	ND	30	µg/L
1,2,4-Trichlorobenzene	ND	0.3	µg/L
Hexachlorobutadiene	ND	0.2	µg/L
Naphthalene	ND	0.6	µg/L
1,2,3-Trichlorobenzene	ND	0.2	µg/L
Di-isopropyl ether	430	1.0	µg/L
Methyl-t-butyl ether	ND	8.0	µg/L
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene	106		

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

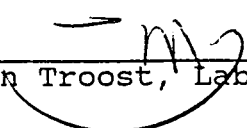
NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





Certificate of Analysis No. L1-9508A65-08

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-101

PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

ANALYTICAL DATA

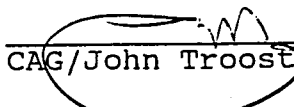
PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 03:12:00	0.5	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

COMMENTS: +Low surrogate recovery. Unable to reextract due to no more sample available.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost Laboratory Manager



Certificate of Analysis No. L1-9508A65-08

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: MW-101

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	1	0.7	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	3	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	ND	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)





Certificate of Analysis No. L1-9508A65-08

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-101

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	PQL*	
sec-Butylbenzene	ND	0.2	µg/L
p-Isopropyltoluene	ND	0.1	µg/L
1,3-Dichlorobenzene	ND	3.2	µg/L
1,4-Dichlorobenzene	ND	2.4	µg/L
n-Butylbenzene	ND	0.2	µg/L
1,2-Dichlorobenzene	ND	1.5	µg/L
1,2-Dibromo-3-chloropropane	ND	30	µg/L
1,2,4-Trichlorobenzene	ND	0.3	µg/L
Hexachlorobutadiene	ND	0.2	µg/L
Naphthalene	ND	0.6	µg/L
1,2,3-Trichlorobenzene	ND	0.2	µg/L
Di-isopropyl ether	ND	1.0	µg/L
Methyl-t-butyl ether	30	8.0	µg/L
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene		104	

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS: +Low surrogate recovery. Unable to reextract due to no more sample available.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-09

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-104

PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95


ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 04:00:00	0.6	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



Certificate of Analysis No. L1-9508A65-09

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: MW-104

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95

ANALYTICAL DATA			
PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	ND	0.7	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	ND	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-09

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-104

PARAMETER	ANALYTICAL DATA (continued)			UNITS
	RESULTS	PQL*		
sec-Butylbenzene	ND	0.2	µg/L	
p-Isopropyltoluene	ND	0.1	µg/L	
1,3-Dichlorobenzene	ND	3.2	µg/L	
1,4-Dichlorobenzene	ND	2.4	µg/L	
n-Butylbenzene	ND	0.2	µg/L	
1,2-Dichlorobenzene	ND	1.5	µg/L	
1,2-Dibromo-3-chloropropane	ND	30	µg/L	
1,2,4-Trichlorobenzene	ND	0.3	µg/L	
Hexachlorobutadiene	ND	0.2	µg/L	
Naphthalene	ND	0.6	µg/L	
1,2,3-Trichlorobenzene	ND	0.2	µg/L	
Di-isopropyl ether	ND	1.0	µg/L	
Methyl-t-butyl ether	ND	8.0	µg/L	
SURROGATES		% RECOVERY		
Fluorobenzene		103		

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-10

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-102

PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

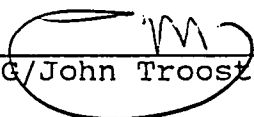
ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 04:48:00	0.4	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-10

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: MW-102

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95

PARAMETER	ANALYTICAL DATA		
	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	ND	0.7	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	ND	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)





LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-10

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-102

PARAMETER	ANALYTICAL DATA (continued)			UNITS
	RESULTS	PQL*		
sec-Butylbenzene	ND	0.2	µg/L	
p-Isopropyltoluene	ND	0.1	µg/L	
1,3-Dichlorobenzene	ND	3.2	µg/L	
1,4-Dichlorobenzene	ND	2.4	µg/L	
n-Butylbenzene	ND	0.2	µg/L	
1,2-Dichlorobenzene	ND	1.5	µg/L	
1,2-Dibromo-3-chloropropane	ND	30	µg/L	
1,2,4-Trichlorobenzene	ND	0.3	µg/L	
Hexachlorobutadiene	ND	0.2	µg/L	
Naphthalene	ND	0.6	µg/L	
1,2,3-Trichlorobenzene	ND	0.2	µg/L	
Di-isopropyl ether	ND	1.0	µg/L	
Methyl-t-butyl ether	130	8.0	µg/L	
SURROGATES		% RECOVERY		
Fluorobenzene		105		

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

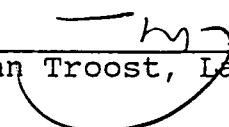
NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-11

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-103

PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

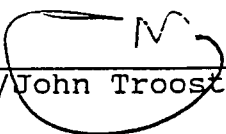
ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 05:35:00	0.6	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060  
 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-11

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: MW-103

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95

ANALYTICAL DATA			
PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	ND	0.7	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	ND	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-11

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-103

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	PQL*	
sec-Butylbenzene	ND	0.2	µg/L
p-Isopropyltoluene	ND	0.1	µg/L
1,3-Dichlorobenzene	ND	3.2	µg/L
1,4-Dichlorobenzene	ND	2.4	µg/L
n-Butylbenzene	ND	0.2	µg/L
1,2-Dichlorobenzene	ND	1.5	µg/L
1,2-Dibromo-3-chloropropane	ND	30	µg/L
1,2,4-Trichlorobenzene	ND	0.3	µg/L
Hexachlorobutadiene	ND	0.2	µg/L
Naphthalene	ND	0.6	µg/L
1,2,3-Trichlorobenzene	ND	0.2	µg/L
Di-isopropyl ether	ND	1.0	µg/L
Methyl-t-butyl ether	140	8.0	µg/L
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene	105		

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

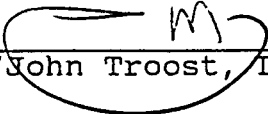
NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-12

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-105

PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 06:23:00	0.4	0.1	mg/L
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-12

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: MW-105

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95

PARAMETER	ANALYTICAL DATA RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	ND	0.7	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	ND	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)





LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-12

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-105

PARAMETER	ANALYTICAL DATA (continued)		UNITS
	RESULTS	PQL*	
sec-Butylbenzene	ND	0.2	µg/L
p-Isopropyltoluene	ND	0.1	µg/L
1,3-Dichlorobenzene	ND	3.2	µg/L
1,4-Dichlorobenzene	ND	2.4	µg/L
n-Butylbenzene	ND	0.2	µg/L
1,2-Dichlorobenzene	ND	1.5	µg/L
1,2-Dibromo-3-chloropropane	ND	30	µg/L
1,2,4-Trichlorobenzene	ND	0.3	µg/L
Hexachlorobutadiene	ND	0.2	µg/L
Naphthalene	ND	0.6	µg/L
1,2,3-Trichlorobenzene	ND	0.2	µg/L
Di-isopropyl ether	ND	1.0	µg/L
Methyl-t-butyl ether	ND	8.0	µg/L
<b>SURROGATES</b>	<b>% RECOVERY</b>		
Fluorobenzene	105		

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

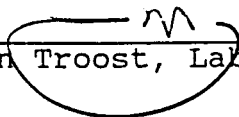
METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: \* - Practical Quantitation Limit  
 NA - Not Analyzed

ND - Not Detected

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-12

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-105

PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

ANALYTICAL DATA

PARAMETER	RESULTS	MDL*	UNITS
Naphthalene	ND	0.100	µg/L
Acenaphthylene	ND	0.020	µg/L
Acenaphthene	ND	0.020	µg/L
Fluorene	ND	0.020	µg/L
Phenanthrene	ND	0.020	µg/L
Anthracene	ND	0.010	µg/L
Fluoranthene	ND	0.010	µg/L
Pyrene	ND	0.010	µg/L
Chrysene	ND	0.007	µg/L
Benzo (a) anthracene	ND	0.002	µg/L
Benzo (b) fluoranthene	ND	0.003	µg/L
Benzo (k) fluoranthene	ND	0.002	µg/L
Benzo (a) pyrene	ND	0.008	µg/L
Dibenzo (a,h) anthracene	ND	0.006	µg/L
Benzo (g,h,i) perylene	ND	0.010	µg/L
Indeno (1,2,3-cd) pyrene	ND	0.006	µg/L
1-Methylnaphthalene	ND	0.100	µg/L
2-Methylnaphthalene	ND	0.100	µg/L

SURROGATES

9,10-Diphenylanthracene

% RECOVERY

49

ANALYZED BY: SJ

DATE/TIME: 09/05/95 21:05:00

EXTRACTED BY: SN

DATE/TIME: 08/29/95 08:00:00

METHOD: 3550/8310 (HPLC)-Polynuclear Aromatic Hydrocarbons

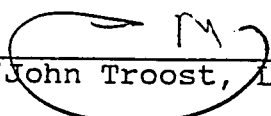
NOTES: \* - Method Detection Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-13

CITGO PETROLEUM CORPORATION  
 2316 TERMINAL DRIVE  
 ARLINGTON HGTS, IL 60005  
 ATTN: SCOTT BUCKNER

P.O.#  
 #2642, TYPE WC  
 DATE: 09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
 SITE: MILWAUKEE, WI/9235 N 107 ST.  
 SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
 SAMPLE ID: MW-ZZ


PROJECT NO: 1096  
 MATRIX: WATER  
 DATE SAMPLED: 08/25/95  
 DATE RECEIVED: 08/26/95

ANALYTICAL DATA				
PARAMETER	RESULTS	DETECTION LIMIT	UNITS	
TOTAL PETROLEUM HYDROCARBONS (GRO) WI LUST GRO # Analyzed by: TB Date: 08/31/95 08:14:01	ND	0.1	mg/L	
TOTAL PETROLEUM HYDROCARBONS (DRO) WI LUST DRO # Analyzed by: AH Date: 08/31/95 09:34:00	0.6	0.1	mg/L	
Lead, Total Method 239.2 * Analyzed by: CB Date: 08/30/95 15:15:00	ND	0.001	mg/L	

ND - Not detected.

Notes: \*Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA  
 \*\*Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.  
 \*\*\*Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

  
 CAG/John Troost, Laboratory Manager



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-13

CITGO PETROLEUM CORPORATION  
2316 TERMINAL DRIVE  
ARLINGTON HGTS, IL 60005  
ATTN: SCOTT BUCKNER

P.O.#  
#2642, TYPE WC  
09/07/95

PROJECT: CITGO MILWAUKEE TERMINAL  
SITE: MILWAUKEE, WI/9235 N 107 ST.  
SAMPLED BY: NATURAL RESOURCE TECHNOLOGY  
SAMPLE ID: MW-ZZ

PROJECT NO: 1096  
MATRIX: WATER  
DATE SAMPLED: 08/25/95  
DATE RECEIVED: 08/26/95

ANALYTICAL DATA

PARAMETER	RESULTS	PQL*	UNITS
Dichlorodifluoromethane	ND	2.9	µg/L
Chloromethane	ND	0.8	µg/L
Vinyl chloride	ND	1.8	µg/L
Chloroethane	ND	5.2	µg/L
Trichlorofluoromethane	ND	1.0	µg/L
1,1-Dichloroethene	ND	1.3	µg/L
Methylene Chloride	ND	0.8	µg/L
trans-1,2-Dichloroethene	ND	1.0	µg/L
1,1-Dichloroethane	ND	0.7	µg/L
2,2-Dichloropropane	ND	0.5	µg/L
cis-1,2-Dichloroethene	ND	0.1	µg/L
Chloroform	ND	0.5	µg/L
1,1,1-Trichloroethane	ND	0.3	µg/L
Carbon Tetrachloride	ND	1.2	µg/L
Benzene	ND	2.0	µg/L
1,2-Dichloroethane	ND	0.3	µg/L
Trichloroethene	ND	1.2	µg/L
1,2-Dichloropropane	ND	0.4	µg/L
Bromodichloromethane	ND	1.0	µg/L
Toluene	ND	2.0	µg/L
1,1,2-Trichloroethane	ND	0.2	µg/L
Tetrachloroethene	ND	0.3	µg/L
1,3-Dichloropropane	ND	0.3	µg/L
Dibromochloromethane	ND	0.9	µg/L
1,2-Dibromoethane	ND	0.8	µg/L
Chlorobenzene	ND	2.5	µg/L
Ethyl benzene	ND	2.0	µg/L
M and P Xylene	ND	2.0	µg/L
O-Xylene	ND	2.0	µg/L
Isopropylbenzene	ND	2.0	µg/L
1,1,2,2-Tetrachloroethane	ND	0.3	µg/L
n-Propyl benzene	ND	0.1	µg/L
Bromobenzene	ND	0.3	µg/L
1,3,5-Trimethylbenzene	ND	0.2	µg/L
2-Chlorotoluene	ND	0.1	µg/L
4-Chlorotoluene	ND	0.2	µg/L
tert-Butylbenzene	ND	0.6	µg/L
1,2,4-Trimethylbenzene	ND	0.5	µg/L

METHOD: Mod. 8021 (VOC) [SW 846]  
(continued on next page)



LAFAYETTE AREA LAB  
 500 AMBASSADOR CAFFERY PKWY.  
 SCOTT, LOUISIANA  
 ZIP 70583-8544  
 PHONE: (318) 237-4775

Certificate of Analysis No. L1-9508A65-13

CITGO PETROLEUM CORPORATION

SAMPLE ID: MW-ZZ

ANALYTICAL DATA (continued)

PARAMETER	RESULTS	PQL*	UNITS
sec-Butylbenzene	ND	0.2	µg/L
p-Isopropyltoluene	ND	0.1	µg/L
1,3-Dichlorobenzene	ND	3.2	µg/L
1,4-Dichlorobenzene	ND	2.4	µg/L
n-Butylbenzene	ND	0.2	µg/L
1,2-Dichlorobenzene	ND	1.5	µg/L
1,2-Dibromo-3-chloropropane	ND	30	µg/L
1,2,4-Trichlorobenzene	ND	0.3	µg/L
Hexachlorobutadiene	ND	0.2	µg/L
Naphthalene	ND	0.6	µg/L
1,2,3-Trichlorobenzene	ND	0.2	µg/L
Di-isopropyl ether	130	1.0	µg/L
Methyl-t-butyl ether	ND	8.0	µg/L

SURROGATES  
 Fluorobenzene

% RECOVERY  
 104

ANALYZED BY: PW

DATE/TIME: 08/30/95 15:14:00

METHOD: Mod. 8021 (VOC) [SW 846]

NOTES: \* - Practical Quantitation Limit

ND - Not Detected

NA - Not Analyzed

COMMENTS:

QUALITY ASSURANCE: Results reported on a Dry Weight basis. This analysis was performed in accordance with EPA guidelines. SPL Cert. #999993060 # LUST Analytical Guidance, Wisconsin DNR, 1993

CAG/John Troost, Laboratory Manager





\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method 8020 \*\*\*

PAGE

Matrix: Soil  
Units: µg/Kg

Batch Id: HPBB950829105101

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
MTBE	ND	50	46.4370	92.9	39 - 150
BENZENE	ND	50	42.7684	85.5	39 - 150
TOLUENE	ND	50	41.8303	83.7	46 - 140
ETHYL_BENZENE	ND	50	41.6147	83.2	32 - 160
1,3,5-TMB	ND	50	48.3183	96.6	32 - 160
1,2,4-TMB	ND	50	54.2387	108	32 - 160
O XYLENE	ND	50	41.5324	83.1	32 - 160
M AND P XYLENE	ND	100	82.1518	82.2	32 - 160

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
BENZENE	ND	50	48.6637	97.3	46.0362	92.1	5.49	20	39 - 150
TOLUENE	ND	50	41.5248	83.0	44.1433	88.3	6.19	20	46 - 140
ETHYL_BENZENE	ND	50	41.4517	82.9	42.9659	85.9	3.55	20	32 - 160
1,3,5-TMB	4.3850	50	47.4846	86.2	47.9543	87.1	1.04	20	32 - 160
1,2,4-TMB	9.9281	50	44.1259	68.4	50.5154	81.2	17.1	20	32 - 160
O XYLENE	ND	50	40.4609	80.9	41.9814	84.0	3.76	20	32 - 160
M AND P XYLENE	3.0978	100	83.6186	80.5	83.7013	80.6	0.124	20	32 - 160

Analyst: TB

Sequence Date: 08/29/95

SPL ID of sample spiked: 9508803-18A

Sample File ID: \BH29207.ra

Method Blank File ID:

Blank Spike File ID: \BH292048.r

Matrix Spike File ID: \BH29226.ra

Matrix Spike Duplicate File ID: \BH29227.ra

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [( <1> - <2> ) / <3> ] x 100

LCS % Recovery = ( <1> / <3> ) x 100

Relative Percent Difference = [ ( <4> - <5> ) / [ ( <4> + <5> ) x 0.5 ] ] x 100

(\*\*) = Source:

(\*\*\*) = Source:

SAMPLES IN BATCH(SPL ID):

9508A65-06A 9508A65-01A 9508A65-02A 9508A65-03A  
9508A65-04A 9508A65-05A

Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 Method 8310 \*\*\*

PAGE

Matrix: Soil  
 Units: µg/Kg

Batch Id: HPLC950831203003

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Naphthalene	ND	1650.00	1368	82.9	30 - 122
Acenaphthylene	ND	1650.00	1588	96.2	30 - 126
Acenaphthene	ND	1650.00	1545	93.6	30 - 124
Fluorene	ND	1650.00	1401	84.9	30 - 142
Phenanthrene	ND	1650.00	1503	91.1	30 - 155
Anthracene	ND	1650.00	1611	97.6	30 - 126
Fluoranthene	ND	1650.00	1479	89.6	30 - 123
Pyrene	ND	1650.00	1565	94.8	30 - 140
Chrysene	ND	1650.00	1497	90.7	30 - 199
Benzo (a) anthracene	ND	1650.000	1519	92.1	30 - 135
Benzo (b) fluoranthene	ND	1650.00	1599	96.9	30 - 150
Benzo (k) fluoranthene	ND	1650.00	1569	95.1	30 - 159
Benzo (a) pyrene	ND	1650.00	1790	108	30 - 128
Dibenzo (a,h) anthracene	ND	1650.00	1458	88.4	30 - 110
Benzo (g,h,i) perylene	ND	1650.00	1601	97.0	30 - 116
Indeno (1,2,3-cd) pyrene	ND	1650.00	1384	83.9	30 - 116
1-Methylnaphthalene	ND	1650.00	1351	81.9	30 - 130
2-Methylnaphthalene	ND	1650.00	1426	86.4	30 - 130

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			Naphthalene	ND	1650.00	1342		81.3	1376
Acenaphthylene	ND	1650.00	1489	90.2	1574	95.4	5.60	30	30 - 126
Acenaphthene	ND	1650.00	1478	89.6	1473	89.3	0.335	30	30 - 124
Fluorene	ND	1650.00	1379	83.6	1366	82.8	0.962	30	30 - 142
Phenanthrene	ND	1650.00	1428	86.5	1426	86.4	0.116	30	30 - 155
Anthracene	ND	1650.00	1496	90.7	1504	91.2	0.550	30	30 - 126
Fluoranthene	ND	1650.00	1391	84.3	1391	84.3	0	30	30 - 123
Pyrene	ND	1650.00	1488	90.2	1204	73.0	21.1	30	30 - 140
Chrysene	ND	1650.00	1425	86.4	1408	85.3	1.28	30	30 - 199
Benzo (a) anthracene	ND	1650.000	1443	87.5	1424	86.3	1.38	30	30 - 135
Benzo (b) fluoranthene	ND	1650.00	1506	91.3	1489	90.2	1.21	30	30 - 150
Benzo (k) fluoranthene	ND	1650.00	1480	89.7	1468	89.0	0.783	30	30 - 159
Benzo (a) pyrene	ND	1650.00	1711	104	1668	101	2.93	30	30 - 128
Dibenzo (a,h) anthracene	ND	1650.00	1343	81.4	1314	79.6	2.24	30	30 - 130
Benzo (g,h,i) perylene	ND	1650.00	1525	92.4	1479	89.6	3.08	30	30 - 130
Indeno (1,2,3-cd) pyrene	ND	1650.00	1222	74.1	1200	72.7	1.91	30	30 - 116

*Karen Grizzaffi*  
 Karen Grizzaffi, QC Officer





\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 Method 8310 \*\*\*

PAGE 0

Matrix: Soil  
 Units: µg/Kg

Batch Id: HPLC950831203003

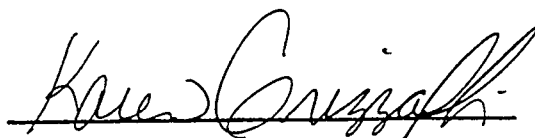
M A T R I X S P I K E S

S P I K E C O M P O U N D S	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			1-Methylnaphthalene	ND	1650.00	1297			
2-Methylnaphthalene	ND	1650.00	1364	82.7	1351	81.9	0.972	30	30 - 130

Analyst: SJ  
 Sequence Date: 08/31/95  
 SPL ID of sample spiked: 9508C24-03B  
 Sample File ID: 9509040050101  
 Method Blank File ID:  
 Blank Spike File ID: 9508310150101  
 Matrix Spike File ID: 9509040030101  
 Matrix Spike Duplicate File ID: 9509040040101

\* = Values Outside QC Range  
 NC = Not Calculated (Sample exceeds spike by factor of 4 or more)  
 ND = Not Detected/Below Detection Limit  
 $\% \text{ Recovery} = [ ( <1> - <2> ) / <3> ] \times 100$   
 $\text{LCS } \% \text{ Recovery} = ( <1> / <3> ) \times 100$   
 $\text{Relative Percent Difference} = [ ( <4> - <5> ) / [ ( <4> + <5> ) \times 0.5 ] ] \times 100$   
 (\*\*) = Source: 8310 SW846  
 (\*\*\*) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):      9508A65-05B   9508A65-06B   9508A65-018   9508A65-02B  
    9508A65-03B   9508A65-04B

  
 Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method 8310 \*\*\*

PAGE

Matrix: Water  
Units: µg/L

Batch Id: HPLC950902123000

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Naphthalene	ND	0.100	0.085	85.0	30 - 122
Acenaphthylene	ND	0.100	0.046	46.0	30 - 126
Acenaphthene	ND	0.100	0.066	66.0	30 - 124
Fluorene	ND	0.100	0.065	65.0	30 - 142
Phenanthrene	ND	0.100	0.067	67.0	30 - 155
Anthracene	ND	0.100	0.063	63.0	30 - 126
Fluoranthene	ND	0.100	0.062	62.0	30 - 123
Pyrene	ND	0.100	0.073	73.0	30 - 140
Chrysene	ND	0.100	0.065	65.0	30 - 199
Benzo (a) anthracene	ND	0.100	0.065	65.0	30 - 135
Benzo (b) fluoranthene	ND	0.100	0.068	68.0	30 - 150
Benzo (k) fluoranthene	ND	0.100	0.066	66.0	30 - 159
Benzo (a) pyrene	ND	0.100	0.074	74.0	30 - 128
Dibenzo (a,h) anthracene	ND	0.100	0.061	61.0	30 - 130
Benzo (g,h,i) perylene	ND	0.100	0.065	65.0	30 - 130
Indeno (1,2,3-cd) pyrene	ND	0.100	0.056	56.0	30 - 130
-Methylnaphthalene	ND	0.100	0.065	65.0	30 - 130
L-Methylnaphthalene	ND	0.100	0.068	68.0	30 - 130

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
NAPHTHALENE	ND	0.100	0.060	60.0	0.053	53.0	12.4	30	30 - 122
ACENAPHTHYLENE	ND	0.100	0.062	62.0	0.061	61.0	1.63	30	30 - 126
ACENAPHTHENE	ND	0.100	0.050	50.0	0.051	51.0	1.98	30	30 - 124
FLUORENE	ND	0.100	0.055	55.0	0.038	38.0	36.6 *	30	30 - 142
PHENANTHRENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 - 155
ANTHRACENE	ND	0.100	0.046	46.0	0.059	59.0	24.8	30	30 - 126
FLUORANTHENE	ND	0.100	0.048	48.0	0.062	62.0	25.5	30	30 - 123
PYRENE	ND	0.100	0.053	53.0	0.066	66.0	21.8	30	30 - 140
CHRYSENE	ND	0.100	0.051	51.0	0.066	66.0	25.6	30	30 - 199
BENZO (A) ANTHRACENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 - 135
BENZO (B) FLUORANTHENE	ND	0.100	0.054	54.0	0.066	66.0	20.0	30	30 - 150
BENZO (K) FLUORANTHENE	ND	0.100	0.052	52.0	0.065	65.0	22.2	30	30 - 159
BENZO (A) PYRENE	ND	0.100	0.058	58.0	0.065	65.0	11.4	30	30 - 128
DIBENZO (A,H) ANTHRACENE	ND	0.100	0.047	47.0	0.061	61.0	25.9	30	30 - 110
BENZO (G,H,I) PERYLENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 - 116
INDENO (1,2,3-CD) PYRENE	ND	0.100	0.042	42.0	0.060	60.0	35.3 *	30	30 - 116

*Karen Grizzaffi*  
Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 Method 8310 \*\*\*

PAGE

0

Matrix: Water  
 Units: µg/L

Batch Id: HPLC950902123000

M A T R I X S P I K E S

S P I K E C O M P O U N D S	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			1-METHYLNAPHTHALENE	ND	0.100	0.047		47.0	0.048
2-METHYLNAPHTHALENE	ND	0.100	0.051	51.0	0.050	50.0	1.98	30	30 - 130

Analyst: SJ

Sequence Date: 09/02/95

SPL ID of sample spiked: MBLK

Sample File ID: 9509010070101

Method Blank File ID:

Blank Spike File ID: 9509010100101

Matrix Spike File ID: 9509010080101

Matrix Spike Duplicate File ID: 9509010090101

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [( <1> - <2> ) / <3> ] x 100

LCS % Recovery = ( <1> / <3> ) x 100

Relative Percent Difference = | <4> - <5> | / [( <4> + <5> ) x 0.5] x 100

(\*\*) = Source: 8310 SW846

(\*\*\*) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508A45-01C 9508A45-02C 9508A45-03C 9508A45-04C  
 9508A45-05C 9508A65-08C 9508A65-07C 9508A65-13C  
 9508A43-01C 9508A43-02C 9508A43-03C 9508A43-04C  
 9508A43-05C

Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method 8310 \*\*\*

PAGE

Matrix: Water  
Units: µg/L

Batch Id: HPLC950905210500

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
NAPHTHALENE	ND	0.100	0.100	100	30 - 122
ACENAPHTHYLENE	ND	0.100	0.113	113	30 - 126
ACENAPHTHENE	ND	0.100	0.087	87.0	30 - 124
FLUORENE	ND	0.100	0.064	64.0	30 - 142
PHENANTHRENE	ND	0.100	0.094	94.0	30 - 155
ANTHRACENE	ND	0.100	0.085	85.0	30 - 126
FLUORANTHENE	ND	0.100	0.070	70.0	30 - 123
PYRENE	ND	0.100	0.101	101	30 - 140
CHRYSENE	ND	0.100	0.096	96.0	30 - 199
BENZO (A) ANTHRACENE	ND	0.100	0.092	92.0	30 - 135
BENZO (B) FLUORANTHENE	ND	0.100	0.089	89.0	30 - 150
BENZO (K) FLUORANTHENE	ND	0.100	0.090	90.0	30 - 159
BENZO (A) PYRENE	ND	0.100	0.096	96.0	30 - 128
DIBENZO (A,H) ANTHRACENE	ND	0.100	0.088	88.0	30 - 130
BENZO (G,H,I) PERYLENE	ND	0.100	0.096	96.0	30 - 130
INDENO (1,2,3-CD) PYRENE	ND	0.100	0.084	84.0	30 - 130
1-METHYLNAPHTHALENE	ND	0.100	0.089	89.0	30 - 130
2-METHYLNAPHTHALENE	ND	0.100	0.094	94.0	30 - 130

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			NAPHTHALENE	ND	0.100	0.060		60.0	0.073
ACENAPHTHYLENE	ND	0.100	0.075	75.0	0.069	69.0	8.33	30	30 - 126
ACENAPHTHENE	ND	0.100	0.055	55.0	0.069	69.0	22.6	30	30 - 124
FLUORENE	ND	0.100	0.043	43.0	0.048	48.0	11.0	30	30 - 142
PHENANTHRENE	ND	0.100	0.058	58.0	0.073	73.0	22.9	30	30 - 155
ANTHRACENE	ND	0.100	0.051	51.0	0.065	65.0	24.1	30	30 - 126
FLUORANTHENE	ND	0.100	0.054	54.0	0.054	54.0	0	30	30 - 123
PYRENE	ND	0.100	0.065	65.0	0.076	76.0	15.6	30	30 - 140
CHRYSENE	ND	0.100	0.062	62.0	0.073	73.0	16.3	30	30 - 199
BENZO (A) ANTHRACENE	ND	0.100	0.059	59.0	0.070	70.0	17.1	30	30 - 135
BENZO (B) FLUORANTHENE	ND	0.100	0.058	58.0	0.074	74.0	24.2	30	30 - 150
BENZO (K) FLUORANTHENE	ND	0.100	0.058	58.0	0.071	71.0	20.2	30	30 - 159
BENZO (A) PYRENE	ND	0.100	0.065	65.0	0.076	76.0	15.6	30	30 - 128
DIBENZO (A,H) ANTHRACENE	ND	0.100	0.055	55.0	0.066	66.0	18.2	30	30 - 110
BENZO (G,H,I) PERYLENE	ND	0.100	0.062	62.0	0.074	74.0	17.6	30	30 - 116
INDENO (1,2,3-CD) PYRENE	ND	0.100	0.049	49.0	0.060	60.0	20.2	30	30 - 116

*Karen Grizzaffi*  
Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 Method 8310 \*\*\*

Matrix: Water  
 Units: µg/L

Batch Id: HPLC950905210500

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			1-METHYLNAPHTHALENE	ND	0.100	0.052			
2-METHYLNAPHTHALENE	ND	0.100	0.057	57.0	0.071	71.0	21.9	30	30 - 130

Analyst: SJ

Sequence Date: 09/05/95

SPL ID of sample spiked: BLK

Sample File ID: 9509050130201

Method Blank File ID:

Blank Spike File ID: 9509050100201

Matrix Spike File ID: 9509050110201

Matrix Spike Duplicate File ID: 9509050060301

\* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [( <1> - <2> ) / <3> ] x 100

LCS % Recovery = ( <1> / <3> ) x 100

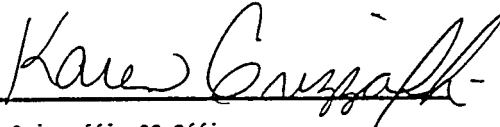
Relative Percent Difference = [ ( <4> - <5> ) / [ ( <4> + <5> ) x 0.5 ] ] x 100

(\*\*) = Source: 8310 SW846

(\*\*\*) = Source: 8310 SW846

SAMPLES IN BATCH(SPL ID):

9508A65-09C 9508A65-10C 9508A65-11C 9508A65-12C

  
 Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method Mod. 8021 \*\*\*

PAGE

Matrix: Water  
Units: µg/L

Batch Id: HPO0950830151400

LABORATORY CONTROL SAMPLE

S P I K E C O M P O U N D S	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
DICHLORODIFLUOROMETHANE	ND	25.0	26.1840	105	50 - 140
CHLOROMETHANE	ND	25.0	21.6794	86.7	50 - 140
VINYL CHLORIDE	ND	25.0	20.5320	82.1	50 - 140
BROMOMETHANE	ND	25.0	28.6995	115	50 - 140
CHLOROETHANE	ND	25.0	26.7342	107	50 - 140
TRICHLOROFUOROMETHANE	ND	25.0	26.3348	105	50 - 140
1,1-DICHLOROETHENE	ND	25.0	24.8164	99.3	50 - 140
METHYLENE CHLORIDE	3.2256	25.0	23.9321	95.7	50 - 140
TRANS-1,2-DICHLOROETHENE	ND	25.0	27.8029	111	50 - 140
1,1-DICHLOROETHANE	ND	25.0	28.4910	114	50 - 140
2,2-DICHLOROPROPANE	ND	25.0	25.9416	104	50 - 140
CIS-1,2-DICHLOROETHENE	ND	25.0	21.4063	85.6	50 - 140
CHLOROFORM	ND	25.0	24.6378	98.6	50 - 140
BROMOCHLOROMETHANE	ND	25.0	26.9981	108	50 - 140
1,1,1-TRICHLOROETHANE	ND	25.0	25.5518	102	50 - 140
1,1-DICHLOROPROPENE	ND	25.0	25.4419	102	50 - 140
CARBON TETRACHLORIDE	ND	25.0	25.7742	103	50 - 140
BENZENE	ND	25.0	23.5152	94.1	50 - 140
1,2-DICHLOROETHANE	ND	25.0	25.0990	100	50 - 140
TRICHLOROETHENE	ND	25.0	22.7991	91.2	50 - 140
1,2-DICHLOROPROPANE	ND	25.0	24.2517	97.0	50 - 140
BROMODICHLOROMETHANE	ND	25.0	26.0986	104	50 - 140
DIBROMOMETHANE	ND	25	27.4817	110	50 - 140
CIS-1,3-DICHLOROPROPENE	ND	25.0	24.7273	98.9	50 - 140
TOLUENE	ND	25.0	23.2886	93.2	50 - 140
TRANS-1,3-DICHLOROPROPENE	ND	25.0	25.3771	102	50 - 140
1,1,2-TRICHLOROETHANE	ND	25.0	24.6771	98.7	50 - 140
TETRACHLOROETHENE	ND	25.0	24.2288	96.9	50 - 140
1,3-DICHLOROPROPANE	ND	25.0	26.8351	107	50 - 140
DIBROMOCHLOROMETHANE	ND	25.0	28.0794	112	50 - 140
1,2-DIBROMOETHANE	ND	25.0	33.5819	134	50 - 140
CHLOROBENZENE	ND	25.0	14.5377	58.2	50 - 140
ETHYL BENZENE	ND	25.0	22.3985	89.6	50 - 140
1,1,1,2-TETRACHLOROETHANE	ND	25.0	22.564	90.3	50 - 140
M AND P XYLENE	ND	50.0	47.1082	94.2	50 - 140
O-XYLENE	ND	25.0	24.1894	96.8	50 - 140
STYRENE	ND	25.0	25.4552	102	50 - 140
ISOPROPYLBENZENE	ND	25.0	25.4923	102	50 - 140
BROMOFORM	ND	25.0	22.9575	91.8	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND	25.0	25.8268	103	50 - 140
1,2,3-TRICHLOROPROPANE	ND	25.0	26.0491	104	50 - 140
1-PROPYL BENZENE	ND	25.0	24.4031	97.6	50 - 140

*Karen Grizzaffi*  
Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
Method Mod. 8021 \*\*\*

PAGE 1

Matrix: Water  
Units: µg/L

Batch Id: HP00950830151400

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
BROMOBENZENE	ND	25.0	29.9129	120	50 - 140
1,3,5-TRIMETHYLBENZENE	ND	25.0	18.6835	74.7	50 - 140
2-CHLOROTOLUENE	ND	25.0	28.7790	115	50 - 140
4-CHLOROTOLUENE	ND	25.0	33.4298	134	50 - 140
TERT-BUTYLBENZENE	ND	25.0	20.3257	81.3	50 - 140
1,2,4-TRIMETHYLBENZENE	ND	25.0	23.3630	93.5	50 - 140
SEC-BUTYLBENZENE	ND	25.0	23.3161	93.3	50 - 140
P-ISOPROPYLTOLUENE	ND	25.0	22.6430	90.6	50 - 140
1,3-DICHLOROBENZENE	ND	25.0	22.5027	90.0	50 - 140
1,4-DICHLOROBENZENE	ND	25.0	23.2425	93.0	50 - 140
N-BUTYLBENZENE	ND	25.0	20.6493	82.6	50 - 140
1,2-DICHLOROBENZENE	ND	25.0	24.8405	99.4	50 - 140
1,2-DIBROMO-3-CHLOROPROPAN	ND	25	28.4156	114	50 - 140
1,2,4-TRICHLOROBENZENE	ND	25.0	24.3000	97.2	50 - 140
HEXACHLOROBUTADIENE	ND	25.0	24.8000	99.2	50 - 140
1-NAPHTHALENE	ND	25.0	24.6000	98.4	50 - 140
1,2,3-TRICHLOROBENZENE	ND	25.0	24.3000	97.2	50 - 140
DI-ISOPROPYL ETHER	ND	25.0	24.0045	96.0	50 - 140
METHYL-T-BUTYL ETHER	ND	25.0	32.7796	131	50 - 140

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
CHLOROETHANE	ND	25.0	25.3091	101	27.5037	110	8.53	30	50 - 140
METHYLENE CHLORIDE	3.2256	25.0	25.3194	88.4	24.6764	85.8	2.99	30	50 - 140
1,1-DICHLOROETHANE	ND	25.0	21.7799	87.1	21.5044	86.0	1.27	30	50 - 140
CHLOROFORM	ND	25.0	23.1033	92.4	23.4565	93.8	1.50	30	50 - 140
1,1,1-TRICHLOROETHANE	ND	25.0	21.9759	87.9	21.8824	87.5	0.456	30	50 - 140
CARBON TETRACHLORIDE	ND	25.0	20.7463	83.0	20.4811	81.9	1.33	30	50 - 140
BENZENE	ND	25.0	22.6443	90.6	23.2782	93.1	2.72	30	50 - 140
1,2-DICHLOROETHANE	ND	25.0	23.8334	95.3	23.2488	93.0	2.44	30	50 - 140
TRICHLOROETHENE	ND	25.0	21.0718	84.3	19.6666	78.7	6.87	30	50 - 140
BROMODICHLOROMETHANE	ND	25.0	19.5835	78.3	18.9835	75.9	3.11	30	50 - 140
TOLUENE	ND	25.0	22.7989	91.2	22.9802	91.9	0.765	30	50 - 140
1,1,2-TRICHLOROETHANE	ND	25.0	23.7975	95.2	24.0071	96.0	0.837	30	50 - 140
TETRACHLOROETHENE	ND	25.0	23.2178	92.9	23.4818	93.9	1.07	30	50 - 140
HLOROETHANE	ND	25.0	24.5309	98.1	25.3393	101	2.91	30	50 - 140

*Karen Grizzaffi*

Karen Grizzaffi, QC Officer



\*\* SPL BATCH QUALITY CONTROL REPORT \*\*  
 Method Mod. 8021 \*\*\*

Matrix: Water  
 Units: µg/L

Batch Id: HP00950830151400

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
			ETHYL BENZENE	ND	25.0	22.2225			
M AND P XYLENE	ND	50.0	46.7081	93.4	46.2217	92.4	1.08	30	50 - 140
O-XYLENE	ND	25.0	23.4333	93.7	24.6352	98.5	4.99	30	50 - 140
ISOPROPYLBENZENE	ND	25.0	25.4072	102	27.2965	109	6.64	30	50 - 140
1,1,2,2-TETRACHLOROETHANE	ND	25.0	29.5070	118	23.8985	95.6	21.0	30	50 - 140
SEC-BUTYLBENZENE	ND	25.0	24.1239	96.5	26.0417	104	7.48	30	50 - 140
P-ISOPROPYLTOLUENE	ND	25.0	23.3667	93.5	25.1803	101	7.71	30	50 - 140
1,3-DICHLOROBENZENE	ND	25.0	20.2280	80.9	19.7089	78.8	2.63	30	50 - 140
1,4-DICHLOROBENZENE	ND	25.0	20.3291	81.3	20.8923	83.6	2.79	30	50 - 140
N-BUTYLBENZENE	ND	25.0	21.4868	85.9	22.0857	88.3	2.76	30	50 - 140
1,2-DICHLOROBENZENE	ND	25.0	22.4629	89.9	23.1550	92.6	2.96	30	50 - 140
NAPHTHALENE	ND	25.0	22.7201	90.9	25.0732	100	9.53	30	50 - 140

Analyst: PW

\* = Values Outside QC Range

Sequence Date: 08/30/95

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

L ID of sample spiked: BLANK

ND = Not Detected/Below Detection Limit

Sample File ID: \EH30302.ra

% Recovery = [( <1> - <2> ) / <3> ] x 100

Method Blank File ID:

LCS % Recovery = ( <1> / <3> ) x 100

Blank Spike File ID: \EH30316.ra

Relative Percent Difference = | <4> - <5> | / [ ( <4> + <5> ) x 0.5 ] x 100

Matrix Spike File ID: \EH30320.ra

(\*\*) = Source: SPL Lafayette, 11/94

Matrix Spike Duplicate File ID: \EH30321.ra

(\*\*\*) = Source: SPL Lafayette, 11/94

SAMPLES IN BATCH(SPL ID):

9508A65-12A 9508A65-13A 9508C04-03A 9508C04-04A  
 9508A65-07A 9508A65-08A 9508A65-09A 9508A65-10A  
 9508A65-11A

Karen Grizzaffi, QC Officer





\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Water

Reported on: 09/01/95

Analyzed on: 08/30/95

Analyst: AH

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Diesel Range Organics  
WI LUST DRO #

SPL Sample ID Number	Blank Value mg/L	Amt Added mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
BLANK_SPIKE	0.1	1.0	100	100	0	50 - 130	30

TPHD950829110000-9509032

Samples in batch:

9508A65-07B 9508A65-08B 9508A65-09B 9508A65-10B  
9508A65-11B 9508A65-12B 9508A65-13B

COMMENTS:

BLANK CONTRIBUTION OF LESS THAN 5 TIMES OF THE DETECTION LIMIT.  
UNABLE TO REEXTRACT DUE TO NO MORE SAMPLES AVAILABLE.

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Water

Reported on: 09/07/95

Analyzed on: 08/31/95

Analyst: TB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Gasoline Range Organics  
WI LUST GRO #

SPL Sample ID Number	Blank Value mg/L	Amt Added mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508A30-01A	ND	5.0	96.0	104	8.0	70 - 130	20

FIDA950831081401-9509212

Samples in batch:

9508A65-07A 9508A65-08A 9508A65-09A 9508A65-10A  
9508A65-11A 9508A65-12A 9508A65-13A

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE AREA LAB  
500 AMBASSADOR CAFFERY PKWY.  
SCOTT, LOUISIANA  
ZIP 70583-8544  
PHONE: (318) 237-4775

\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Soil

Reported on: 08/31/95

Analyzed on: 08/30/95

Analyst: DB

This sample was randomly selected for use in the SPL quality control program. The results are as follows:

Total Solids  
Method 2540G \*\*

-- DUPLICATE ANALYSIS --

SPL Sample ID	Original Sample Concentration %	Duplicate Sample %	RPD	RPD Max.
9508B95-05A	90.4	87.9	2.8	20

TSOL950830150000-9508E56

Samples in batch:

9508A65-01B    9508A65-02B    9508A65-03B    9508A65-04B  
9508A65-05B    9508A65-06B    9508B94-01A    9508B94-02A  
9508B94-03A    9508B94-04A    9508B94-05A    9508B94-06A  
9508B94-07A    9508B95-01A    9508B95-02A    9508B95-03A  
9508B95-04A    9508B95-05A    9508C05-03A

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



\*\* SPL QUALITY CONTROL REPORT \*\*

Matrix: Water

Reported on: 08/31/95

Analyzed on: 08/30/95

Analyst: CB

This sample was randomly selected for use in the SPL quality control program. Samples chosen are fortified with a known concentration in duplicate. The results are as follows:

Lead, Total  
Method 239.2 \*

SPL Sample ID Number	Blank Value mg/L	Amt Added mg/L	Matrix Spike Recovery %	Matrix Spike Duplicate Recovery %	Relative Percent Difference %	QC Limits Recovery	RPD Max.
9508A65-07D	ND	80	90.4	93.1	2.9	75 - 125	20

5100950830151500-9508E60

Samples in batch:

9507A73-01C    9508A65-07D    9508A65-08D    9508A65-09D  
9508A65-10D    9508A65-11D    9508A65-12D    9508A65-13D  
9508A72-01C    9508B48-01C    9508B91-01C

COMMENTS:

SPL, Incorporated

Karen Grizzaffi, QC Officer



LAFAYETTE LAB  
P.O. BOX 31780  
LAFAYETTE, LA  
ZIP 70593-1780  
PHONE: (318) 984 23

SPL CHEST # \_\_\_\_\_

ENVIRONMENTAL LABORATORY

DATE 8-26-95

CLIENT CHEST: YES/NO

SAMPLE LOGIN CHECKLIST

	YES	NO
1) IS A CHAIN-OF CUSTODY FORM PRESENT:	<u>  /  </u>	<u>      </u>
2) IS THE COC PROPERLY COMPLETED:	<u>  /  </u>	<u>      </u>
IF NO, DESCRIBE WHAT IS INCOMPLETE:	<u>      </u>	<u>      </u>

3) HAS CLIENT BEEN CONTACTED ABOUT INCOMPLETE COC:	<u>      </u>	<u>      </u>
4) IS AIRBILL/PACKING LIST/BILL OF LADING ATTACHED TO SHIPMENT:	<u>  /  </u>	<u>      </u>
IF YES, ID# <u>6494484290 - Fed-X</u>	<u>      </u>	<u>      </u>

5) ARE CUSTODY SEALS PRESENT ON THE PACKAGE:	<u>      </u>	<u>  /  </u>
IF YES, ARE THEY INTACT UPON RECEIPT:	<u>      </u>	<u>  /  </u>

6) ARE ALL SAMPLES TAGGED OR LABELED:	<u>  /  </u>	<u>      </u>
DO THE LABELS MATCH THE COC:	<u>  /  </u>	<u>      </u>
IF NO, HAS CLIENT BEEN CONTACTED ABOUT IT:	<u>      </u>	<u>      </u>
(PLACE SUBSEQUENT DOCUMENTATION FROM CLIENT IN REMARKS)	<u>      </u>	<u>      </u>

7) DO ALL SHIPPING DOCUMENTS AGREE:	<u>  /  </u>	<u>      </u>
IF NO, DESCRIBE WHAT IS IN NONCONFORMITY:	<u>      </u>	<u>      </u>

8) CONDITION/TEMPERATURE OF SHIPPING CONTAINER:

OK 40c

BB-5  
FS-5  
3w  
7

9) CONDITION OF SAMPLE CONTAINERS:

OK

**FREIGHT**

10) SAMPLE DISPOSAL: SPL   /   RETURN TO CLIENT \_\_\_\_\_  
REMARKS/CONTACT/PHONE/DATE: \_\_\_\_\_

CO.: Natural Resource Tech REPTS TO: \_\_\_\_\_ INV. TO: \_\_\_\_\_

PROJ #: \_\_\_\_\_ ATTN: \_\_\_\_\_ ATTN: \_\_\_\_\_

PROJ LOC.: WTI ADDR: \_\_\_\_\_ ADDR: \_\_\_\_\_

SPL REP.: Sedh CTY/ST \_\_\_\_\_ CTY/ST \_\_\_\_\_

9508HLS

CHAIN OF CUSTODY RECORD

Sample Collectors(s)/Signature(s) <b>REBECCA J. KOEPKE</b>			NATURAL RESOURCE TECHNOLOGY, INC. PEWAUKEE, WISCONSIN			Laboratory Samples are Being Submitted To: <u>S.P.L. Scott, LA</u>											
Site Name: <u>CITGO PETROLEUM</u>			Send Report To: <u>Tim Mueller</u> Project Number: <u>1076</u>			Temperature of temperature blank _____ If sample(s) were received on ice and there was ice remaining, you may report the temperature as "received on ice". If all of the ice was melted, the temperature of the melt may be substituted for a temperature blank.											
Site Address: <u>107th St. Milwaukee WI</u>			Project Manager: <u>BECKY KOEPKE</u> Task Number: _____ Natural Resource Technology, Inc. 23713 W. Paul Road Pewaukee, WI 53072 Telephone (414) 523-9000 Fax (414) 523-9001														
I hereby certify that I received, properly handled, and maintained custody of these samples as noted below:						Analytical Method / Numbers			Lab Use Only								
Relinquished By (Signature) <u>[Signature]</u>		Date/Time <u>19:00</u>	Received By (Signature) <u>Air Bill # FED EX 6494484290</u>		Date/Time <u>19:00</u>	<u>PIVOC (W)</u> <u>PAH (W)</u> <u>PAH (Water)</u> <u>PRO (Water)</u> <u>GRO (Water)</u> <u>VOC (Water)</u> <u>Lead (Water)</u>											
Relinquished By (Signature)		Date/Time	Received By (Signature) <u>6494484290</u>		Date/Time												
Relinquished By (Signature)		Date/Time	Received By (Signature) <u>[Signature]</u>		Date/Time <u>8-26-95-0945</u>												
Field ID Number	Date Collected	Time Collected	Sample		Location / Description	PID Reading	Field Comments	Preserv. Type	# of Cont.	Analytical Method / Numbers					Lab ID Number	Sample Conditions @ Laboratory	
			Media	Device						PIVOC (W)	PAH (W)	PAH (Water)	PRO (Water)	GRO (Water)			VOC (Water)
MW-110(3.5)	08/23/95		SOIL	SS	DEPTH 2.5-4.5			ICE	2	X	X						
MW-111(3.5)	08/24/95		SOIL	SS	DEPTH 2.5-4.5			ICE	2	X	X						
MW-106(3.5)	8/25/95				" " "				2	X	X						
MW-107(3.5)					" " "				2	X	X						
MW-108(3.5)					" " "				2	X	X						
MW109-3.5					" " "				2	X	X						
PZ-101	8/25/95		GW	Boiler	Piez. 101				7			1	1	2	2	1	
MW-101					MW-101				7			1	1	2	2	1	
MW-104					MW-104				7			1	1	2	2	1	
MW-102					MW-102				7			1	1	2	2	1	
MW-103					MW-103				7			1	1	2	2	1	
MW-105					MW-105				7			1	1	2	2	1	
MW-22					MW-22				7			1	1	2	2	1	
SPECIAL INSTRUCTIONS <b>NEED RESULTS BY 9-4-95</b>										Laboratory shall retain samples for 30 days after issuing analytical report unless indicated otherwise below: Return _____ Other _____							
All Methods WISCONSIN, (A) PRESERVED w/ HCL (B) PRESERVED w/ Nitric Acid																	

FACTORY DATE 8-25-95

IST

YES

NOTE COC: ATTACHED

GE:

IT: CLIENT IN REMARKS

COMMITTY:

CONTAINER:

FREE

RETURN TO CLIENT

# FedEx USA Airbill

Tracking Number **6494484290**

1 From Date **8/25/95** Sender's Name **Eric Kovatch**

Company **Natural Resource Tech** Phone **414 323-9000**

Address **23713 W. Paul Rd.** City **Pewaukee WI 53072**

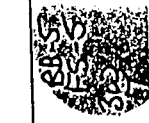
2 Your Internal Billing Reference Information **Lafa** State **WI** Zip **53072**

3 To Recipient's Name **John Troost** Company **SOUTHERN PETROLEUM LAB** Phone **312-237-4775**

Address **500 AMBASSADOR CAFEERY PKWY** State **LA** Zip **70503**

for "HOLD" Service check here  Weekday  Saturday

For Saturday Delivery check here  (Extra Charge Not available to all locations)



4 Service\* 178 500 43677162 51 10  
 FedEx Priority Overnight (Next business morning)  
 FedEx Govt. Overnight (Authorized user only)  
 FedEx 2Day (Second business day)  
 FedEx Overnight Freight (For packages over 150 pounds. Call for delivery schedule.)  
 FedEx 2Day Freight

5 Packaging "Delivery commitment may be later in some areas"  
 FedEx Letter\*  FedEx Pak\*  FedEx Box  FedEx Tube  Other Packaging (Declared value limit \$500)

6 Special Handling Does this shipment contain dangerous goods?  No  Yes (As per attached Shipper's Declaration)  
 Dry Ice (Dry Ice, 9, UN 1845 III) (Dangerous Goods Shipper's Declaration not required) An 904 CA  Cargo Aircraft Only

7 Payment Bill to:  Sender (Account no. in section 1 will be billed)  Recipient (Enter FedEx account no. or Credit Card no. below)  Third Party  Credit Card  Cash/Check

Total Packages **2** Total Weight **13.7** Total Declared Value \$ **0.00** Total Charges \$ **0.00**

8 Release Signature  Credit Card Auth.

Your signature authorizes Federal Express to deliver this shipment without obtaining a signature and agrees to indemnify and hold harmless Federal Express from any resulting claims

194

CO.: Natural Resource Tech REPTS TO: \_\_\_\_\_ INV. TO: \_\_\_\_\_  
PROJ #: \_\_\_\_\_ ATTN: \_\_\_\_\_ ATTN: \_\_\_\_\_  
PROJ LOC.: WI ADDR: \_\_\_\_\_ ADDR: \_\_\_\_\_  
SPL REP.: Stech CTY/ST: \_\_\_\_\_ CTY/ST: \_\_\_\_\_

**APPENDIX G**

**MICROBIAL AND NUTRIENT ANALYTICAL REPORTS**



**Facsimile Cover Sheet**

NOTICE: This facsimile is intended only for the addressee shown below and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this transmission in error, please notify us immediately by telephone and return the original material to BioRenewal Technologies at the below address via U.S. Postal Service. Thank you for your cooperation.

To: **Tim Mueller/Rebecca Koepke**  
Company: **Natural Resource Technology, Inc.**  
Phone: **414/523-9000**  
Fax: **414/523-9001**

From: **M. Lynn Haugh**  
Company: **BioRenewal Technologies, Inc.**  
Phone: **608/276-8980**  
Fax: **608/273-6989**

Date: **September 27, 1995**  
Pages (incl cover page): **5**

**MASTER FILE COPY**PROJECT # 1096CO: data

If there is a problem with this transmission, please call (608) 276-8980

**Comments:**

re: BioRenewal Job Code ABF

Dear Tim/Becky::

Here are the results from our comparative enumeration assays and nutrient analyses for the 3 soil samples you sent us in connection with the Citgo Terminal site located in Milwaukee, WI (project number 1096, task 4). These samples were received by BioRenewal Technologies, Inc. on 8/18 & 8/19/95. I will enclose the invoice and chain of custody for this job with the mailed confirmation copy.

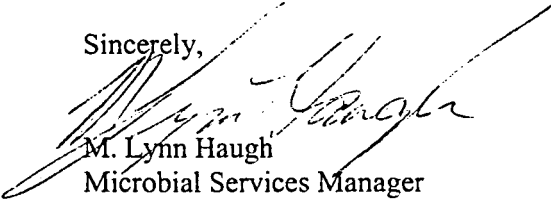
The analytical results requested are presented in the following sections:

- Site suitability for passive bioremediation in relation to suggested guidelines
- Microbial data summary
- Nutrient conditions
- Soil physical conditions.

These samples were processed by BioRenewal using weathered gasoline or diesel fuel (separately) as the sole carbon source for enumerating the "degrader" populations. Samples were received on ice and cold.

Please give me a call if you wish to further discuss these results or have other questions. Thank you for retaining BioRenewal for the project. We look forward to working again with you in the future.

Sincerely,

  
M. Lynn Haugh  
Microbial Services Manager

Enclosures: Analytical results  
Invoice  
Chain of custody

**Site Information**

Site Name	Citgo Terminal	Number samples	3
Location	Milwaukee, WI	Sample Type	soil
Contaminant	weathered gas or diesel		
Consultant	Natural Resource Technology	Date received	18-Aug & 19-Aug-95
Proj. Contact	Rebecca Koepke	Date of this Report	18-Sep-95
Project Ref ID	1096 (Task 4)	BioRenewal Job Code	ABF

**Section I - Summary of Bioremediation Data**

Nutrient/physical factors are as suggested by Wisconsin DNR guidelines for site characterization requirements for natural biodegradation. Microbial factors are shown according to bio-engineering norms.

	Soil microbial populations:		Soil moist content:		pH	% TON of organic matter	C:N	C:P
	<u>Exceeds norm for:</u>		% of field capacity	% Air-filled pore space				
	Passive	Active						
Suggested guideline	>1E+06	>1E+03	25-85%	>10%	5.5-8.5	>1.5%	<40	<120
Note Ref.	1	2	3	4	5	6	7	8
MW-102 (3)	x	✓	x	✓	x	✓	✓	x
MW-104 (3.5)	x	✓	✓	✓	x	✓	✓	x
SB-102 (3.5)	x	✓	x	✓	x	✓	✓	x

The nutrient/physical parameters summarized above, in the case of unsaturated zone soils, reflect suggested minimum Wis Dept of Nat Res "site characterization requirements for natural biodegradation projects" as presented on pp 10-11 in Interim Guidance for Natural Biodegradation as a Remedial Action Option Dated February 8, 1993. BioRenewal stress that these "suggested guidelines" are only intended to provide a working frame of reference for evaluation. Each site is unique and requires professional judgement in order to select an appropriate remedial design. We provide this information in recognition that our clients need to work within the guidelines suggested by the state. Further, we hope this will facilitate continued evolution of a working framework for evaluating sites as to the potential for bioremediation whether through site augmentation or natural attenuation.

Notes: Check indicates that sample meets guideline. Blank indicates no detect or data not available for that sample.

x indicates sample does not meet guideline.

- 1) Microbial population levels in soils generally accepted as potentially adequate to support passive biodegradation. These levels are based on bio-engineering norms and not WDNR guidelines.
- 2) Microbial population levels in soils generally accepted as minimum to serve as an "inoculum" for implementing active bioremediation strategies.
- 3) See page 10, WDNR as referenced above. The suggested optimum range is 50-80% (P. 6).
- 4) See page 8 and 10, WDNR. WDNR suggests a minimum air-filled porosity in soil of 10% is necessary for adequate oxygen diffusion in the soil gas to support biodegradation.
- 5) See pages 7 and 11, WDNR.
- 6) See pages 9 and 11, WDNR. Total Organic Nitrogen (calculated from TKN values minus ammonium nitrogen values) divided by organic matter.
- 7) See pages 9 and 11, WDNR.
- 8) See pages 9 and 11, WDNR.

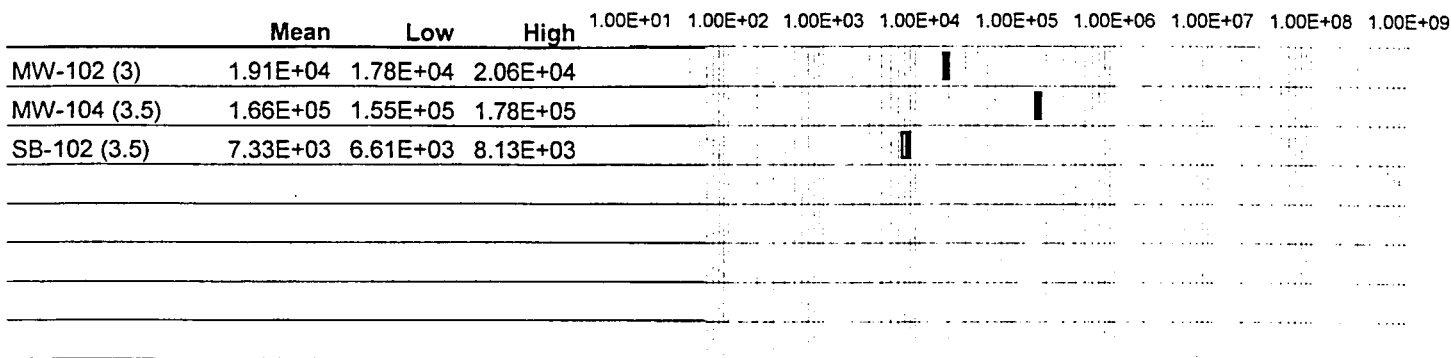
**Section II - Microbial Data Summary**

All values in cfu/gm (DSW)

**Soil Samples**

Low and High indicate 95% Confidence Range

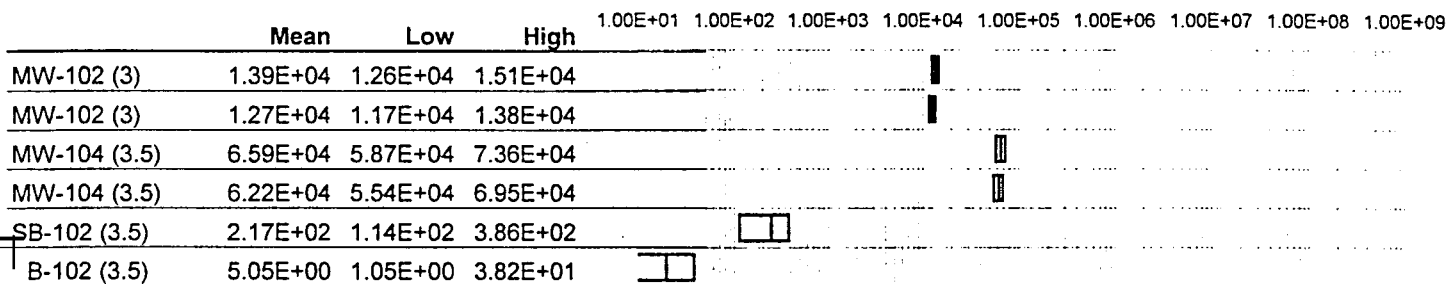
**Total populations**



**Soil Samples**

Low and High indicate 95% Confidence Range

**Degrader populations**



**Marginal inoculum**

**Inoculum levels**

**Active degradation levels**

Marginal inoculum = Degrader populations below 1.0E+03 are indicative of severe limitations and likely require major augmentation of site conditions to attain adequate cell mass to attain measurable biotransformation rates.

Inoculum levels = Degrader populations between 1.0E+03 and 1.0E+06 are amenable to site augmentation but generally are insufficient to attain adequate biotransformation without increased populations.

Active degradation levels = Degrader populations greater than 1.0E+06 are generally of sufficient magnitude to support measurable biotransformation. Additional site augmentation may still be required to attain desirable rates of transformation.

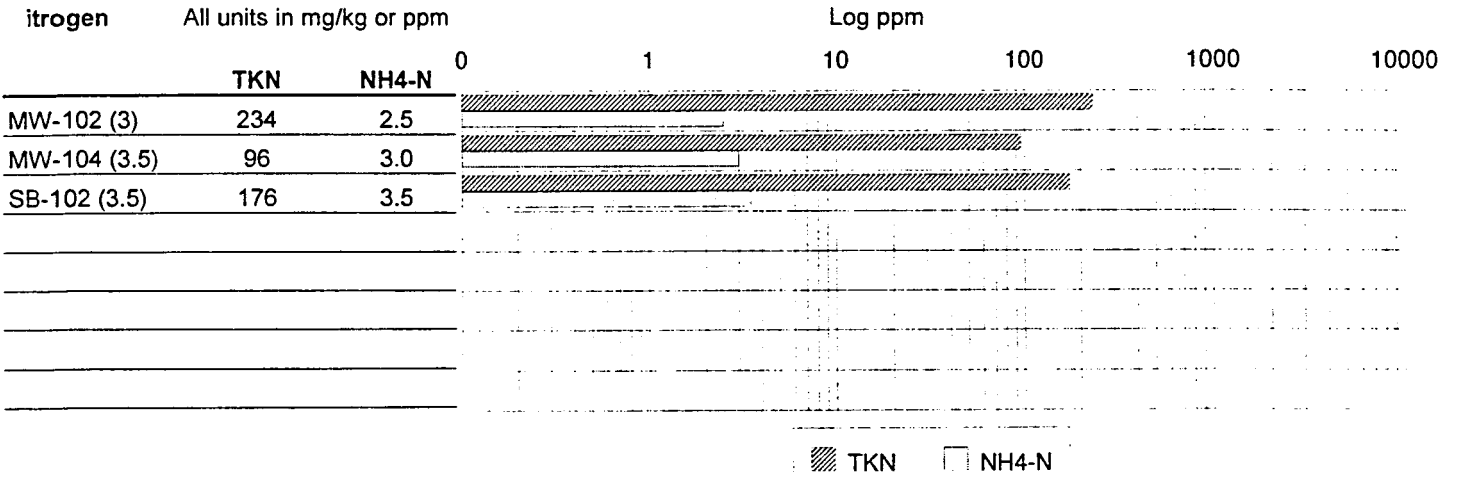
**Assay conditons**

	Carbon source	% Carbon (v/v)	Incubation Temperature	Growth Conditions	Degrees of Freedom**	
					Totals	Degraders
MW-102 (3)	diesel	1.0	22	Aerobic	9	9
MW-102 (3)	weathered gas	1.0	22	Aerobic	9	9
MW-104 (3.5)	diesel	1.0	22	Aerobic	9	4
MW-104 (3.5)	weathered gas	1.0	22	Aerobic	9	4
SB-102 (3.5)	diesel	1.0	22	Aerobic	9	4
SB-102 (3.5)	weathered gas	1.0	22	Aerobic	9	4

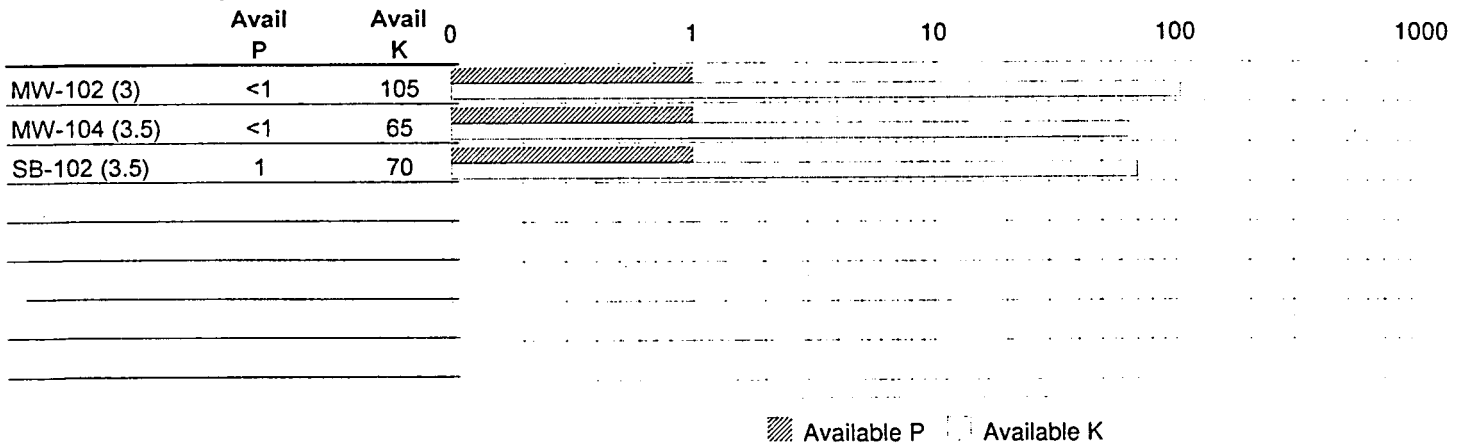
cfu/gm (DSW) = colony forming units per gm of dry soil weight

Degrees of freedom is number of replicates minus one. This parameter is used in calculation of 95% confidence intervals.

**Section III - Nutrient Conditions**



**Available Phosphorus and Potassium**



**Organic Matter and Related Analyses**

Guideline Published Thresholds*			C:N	C:P							
Wis Dept. Natural Resources			Below:	40	120						
Nat'l Academy of Sciences			Below:	6	30						
	% Organic Matter	TOC**	Calculated Ratios		Mg ppm	Ca ppm	Cation Exc Capacity Meq/100g	pH	SO4-S ppm	NO3-N ppm	
			C:N	C:P							
MW-102 (3)	0.4%	1,560	7	>1,560	NR	NR	NR	8.6	NR	NR	
MW-104 (3.5)	0.3%	1,170	13	>1,170	NR	NR	NR	8.8	NR	NR	
SB-102 (3.5)	0.3%	1,170	7	1,170	NR	NR	NR	8.7	NR	NR	

\* Sources: Natural Biodegradation as a Remedial Action Option - Interim Guidance, Wisconsin Dept of Nat Res. (1993) and In-situ Bioremediation: When Does it Work?, B. Rittman, Ed., National Academy of Sciences, 1993 p 117.

\*\* Estimated total organic carbon (expressed in ppm) calculated from % organic matter - See Methods.

n/a = Not applicable

Note To determine C:N and C:P ratios, phosphorus is expressed as available phosphorus, total organic carbon (TOC) is calculated from percent organic carbon and total organic nitrogen is calculated as total Kjeldahl nitrogen (TKN) minus ammonium nitrogen.

**Section IV - Soil Physical Conditions**

**Particle size**

	Gravel Fraction	Sand	Silt	Clay	Percent Gravel - Sand - Silt - Clay															
					0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%					
MW-102 (3)	NR	NR	NR	NR																
MW-104 (3.5)	NR	NR	NR	NR																
SB-102 (3.5)	NR	NR	NR	NR																

n/a=not applicable  
NR=not requested

■ % Gravel    ▨ % Sand    □ % Silt    □ % Clay

**Soil Oxygen and Moisture Conditions**

	% Air-filled pore space	CEA % Moisture	Core % Moisture	% Water Holding Capacity	Moisture as % Water Holding Capacity						
						0.0%	10.0%	20.0%	30.0%	40.0%	50.0%
MW-102 (3)	22.9%	16.7%	15.2%	16.5%	91.8%						
MW-104 (3.5)	31.4%	13.8%	14.5%	18.2%	79.8%						
SB-102 (3.5)	16.8%	13.2%	13.5%	15.2%	88.5%						

n/a=not applicable  
NR=not requested

■ % Soil Moisture    □ % Water holding capacity



CHAIN OF CUSTODY RECORD

Sample Collector(s)/Signature(s) <i>REBECCA T. KOEPKE</i>		NATURAL RESOURCE TECHNOLOGY, INC. PEWAUKEE, WISCONSIN			Laboratory Samples are Being Submitted To: <u>BTI</u>						
Quote Number/Addendum Number _____		Attached: YES ___ NO ___									
Site Name: <u>ECITGO TERM</u>		Send Report To: <u>TIM MUELLER</u>			Project Number: <u>1096</u>						
Site Address: <u>9235 N. 107TH STREET</u> <u>MILWAUKEE WI</u>		Project Manager: <u>DELOX KOEPKE</u>			Task Number: _____						
		23713 W. Paul Road Pewaukee, WI 53072 Telephone (414) 523-9000 Fax (414) 523-9001			Temperature of temperature blank _____ If sample(s) were received on ice and there was ice remaining, you may report the temperature as "received on ice". If all of the ice was melted, the temperature of the melt may be substituted for a temperature blank.						
I hereby certify that I received, properly handled, and maintained custody of these samples as noted below:											
Relinquished By (Signature) <i>DeLox Koepke</i>		Date/Time <u>08/17/95 1905</u>		Received By (Signature) <u>FED EX - (1680-7799-8)</u>			Date/Time <u>8/18/95 1200</u>		Analytical Method / Numbers <i>COMPARATIVE EA-ANDBOX NUTRIENTS REDOX POTENTIAL PERCENT AIR-FILLED PORES SOIL MOISTURE HOLDING CAPACITY</i>		
Relinquished By (Signature)		Date/Time		Received By (Signature) <i>Ernst K Rein</i>			Date/Time				
Relinquished By (Signature)		Date/Time		Received By (Signature)			Date/Time				
Field ID Number	Date Collected	Time Collected	Sample		Location / Description	PID Reading	Field Comments	Preserv. Type	# of Cont.	Lab ID Number	Sample Conditions @ Laboratory
			Media	Device							
<u>MW-102(3)</u>	<u>08/17/95</u>	<u>1040</u>	<u>SOIL</u>	<u>SS</u>	<u>MW-102</u> <i>DET/TH 2-4</i>			<u>KE</u>	<u>3</u>	<u>X X X X X</u>	<u>ABFO1</u>
SPECIAL INSTRUCTIONS <u>NUTRIENTS: TOTAL KJELDAHL NITROGEN, AMMONIUM NITROGEN, AVAILABLE PHOSPHORUS, AVAILABLE POTASSIUM, pH, PERCENT ORGANIC MATTER, PERCENT SOLIDS.</u>										Laboratory shall retain samples for 30 days after issuing analytical report unless indicated otherwise below. Return ___ Other _____	

**Facsimile Cover Sheet**

NOTICE: This facsimile is intended only for the addressee shown below and may contain confidential or privileged information. If the recipient of this material is not the intended recipient or if you have received this transmission in error, please notify us immediately by telephone and return the original material to BioRenewal Technologies at the below address via U.S. Postal Service. Thank you for your cooperation.

To: **Tim Mueller/Rebecca Koepke**  
Company: **Natural Resource Technology, Inc.**  
Phone: **414/523-9000**  
Fax: **414/523-9001**

From: **M. Lynn Haugh**  
Company: **BioRenewal Technologies, Inc.**  
Phone: **608/276-8980**  
Fax: **608/273-6989**

Date: **September 27, 1995**

Pages (incl cover page): **4**

**FAXED**  
2/27/95

**MASTER FILE COPY**

PROJECT # 1096  
CO: data

If there is a problem with this transmission, please call (608) 276-8980

**Comments:**

re: BioRenewal Job Code ABO

Dear Tim/Becky::

Here are the results from our comparative enumeration assays and nutrient analyses for the 3 groundwater samples you sent us in connection with the Citgo Terminal site located in Milwaukee, WI (project number 1096, task 4). These samples were received by BioRenewal Technologies, Inc. on 8/30/95. I will enclose the invoice and chain of custody for this job with the mailed confirmation copy.

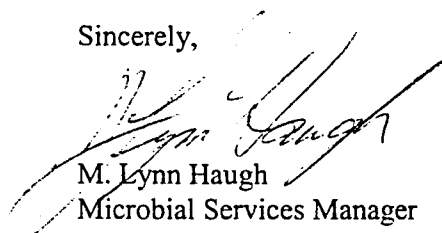
The analytical results requested are presented in the following sections:

- Site suitability for passive bioremediation in relation to suggested guidelines
- Microbial data summary
- Nutrient conditions

These samples were processed by BioRenewal using weathered gasoline or diesel fuel (separately) as the sole carbon source for enumerating the "degrader" populations. Samples were received on ice and cold.

Please give me a call if you wish to further discuss these results or have other questions. Thank you for retaining BioRenewal for the project. We look forward to working again with you in the future.

Sincerely,

  
M. Lynn Haugh  
Microbial Services Manager

Enclosures: Analytical results  
Invoice  
Chain of custody



Site Information

Site Name	Citgo Terminal	Number samples	3
Location	Milwaukee, WI	Sample Type	groundwater
Contaminant	weathered gas or diesel		
Consultant	Natural Resource Technology	Date received	30-Aug-95
Proj. Contact	Rebecca Koepke	Date of this Report	26-Sep-95
Project Ref ID	1096 (Task 4)	BioRenewal Job Code	ABO

Section I - Summary of Bioremediation Data

Nutrient/physical factors are as suggested by Wisconsin DNR guidelines for site characterization requirements for natural biodegradation. Microbial factors are shown according to bio-engineering norms.

	Soil microbial populations:		Soil moist. content:		pH	% TON of organic matter	C:N	C:P
	<u>Exceeds norm for:</u>		% of field capacity	% Air-filled pore space				
	Passive	Active						
Suggested guideline	>1E+06	>1E+03	25-85%	>10%	5.5-8.5	>1.5%	<40	<120
Note Ref.	1	2	3	4	5	6	7	8
MW-102	Guidelines not valid for groundwater at this time.							
MW-103	Guidelines not valid for groundwater at this time.							
MW-104	Guidelines not valid for groundwater at this time.							

The nutrient/physical parameters summarized above, in the case of unsaturated zone soils, reflect suggested minimum Wis Dept of Nat Res "site characterization requirements for natural biodegradation projects" as presented on pp 10-11 in Interim Guidance for Natural Biodegradation as a Remedial Action Option Dated February 8, 1993. BioRenewal stress that these "suggested guidelines" are only intended to provide a working frame of reference for evaluation. Each site is unique and requires professional judgement in order to select an appropriate remedial design. We provide this information in recognition that our clients need to work within the guidelines suggested by the state. Further, we hope this will facilitate continued evolution of a working framework for evaluating sites as to the potential for bioremediation whether through site augmentation or natural attenuation.

Notes: Check indicates that sample meets guideline. Blank indicates no detect or data not available for that sample.

\* indicates sample does not meet guideline.

- 1) Microbial population levels in soils generally accepted as potentially adequate to support passive biodegradation. These levels are based on bio-engineering norms and not WDNR guidelines.
- 2) Microbial population levels in soils generally accepted as minimum to serve as an "inoculum" for implementing active bioremediation strategies.
- 3) See page 10, WDNR as referenced above. The suggested optimum range is 50-80% (P. 6).
- 4) See page 8 and 10, WDNR. WDNR suggests a minimum air-filled porosity in soil of 10% is necessary for adequate oxygen diffusion in the soil gas to support biodegradation.
- 5) See pages 7 and 11, WDNR.
- 6) See pages 9 and 11, WDNR. Total Organic Nitrogen (calculated from TKN values minus ammonium nitrogen values) divided by organic matter.
- 7) See pages 9 and 11, WDNR.
- 8) See pages 9 and 11, WDNR.

Section II - Microbial Data Summary continued All values in cfu/ml

Groundwater  
Samples

Low and High indicate 95% Confidence Range

Total populations

	Mean	Low	High	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05	1.00E+06	1.00E+07	1.00E+08	1.00E+09
MW-102	1.61E+06	1.50E+06	1.72E+06									
MW-103	8.92E+05	8.01E+05	9.89E+05									
MW-104	1.24E+06	1.15E+06	1.34E+06									

Groundwater  
Samples

Low and High indicate 95% Confidence Range

Degrader populations

	Mean	Low	High	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05	1.00E+06	1.00E+07	1.00E+08	1.00E+09
MW-102	1.23E+06	1.13E+06	1.33E+06									
MW-102	1.15E+06	1.06E+06	1.26E+06									
MW-103	2.44E+05	2.32E+05	2.59E+05									
MW-103	1.93E+05	1.79E+05	2.08E+05									
MW-104	2.03E+05	1.89E+05	2.16E+05									
MW-104	2.00E+05	1.86E+05	2.17E+05									
Marginal inoculum												
Inoculum levels												
Active degradation levels												

Marginal inoculum = Degrader populations below 1.0E+03 are indicative of severe limitations and likely require major augmentation of site conditions to attain adequate cell mass to attain measurable biotransformation rates.

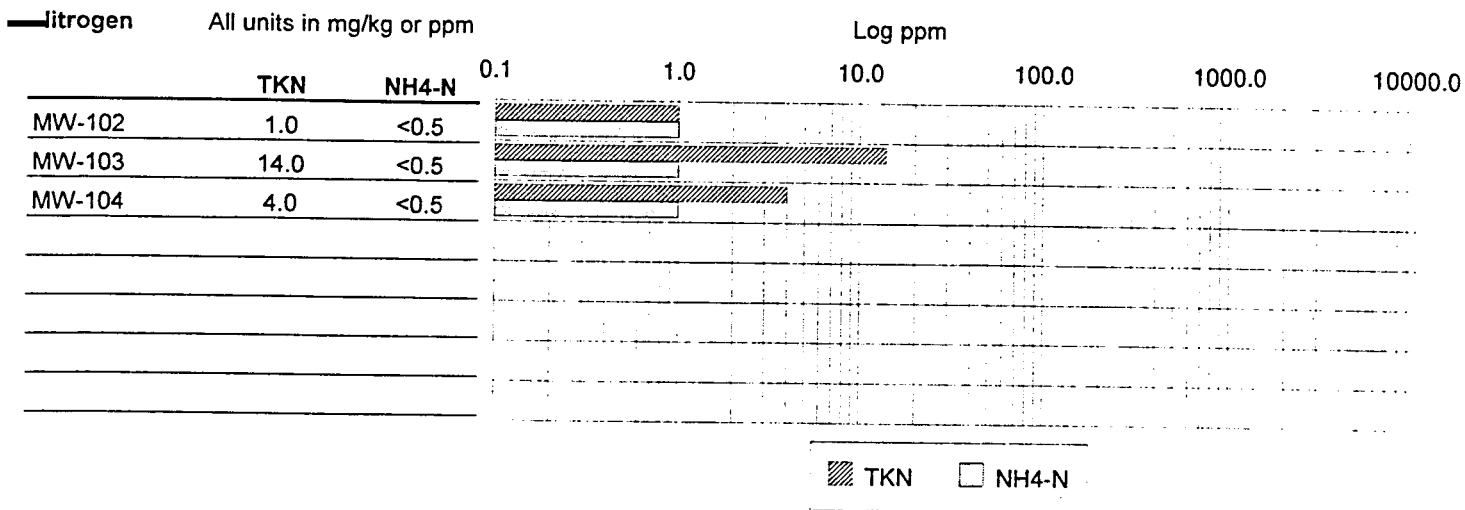
Inoculum levels = Degrader populations between 1.0E+03 and 1.0E+06 are amenable to site augmentation but generally are insufficient to attain adequate biotransformation without increased populations.

Active degradation levels = Degrader populations greater than 1.0E+06 are generally of sufficient magnitude to support measurable biotransformation. Additional site augmentation may still be required to attain desirable rates of transformation.

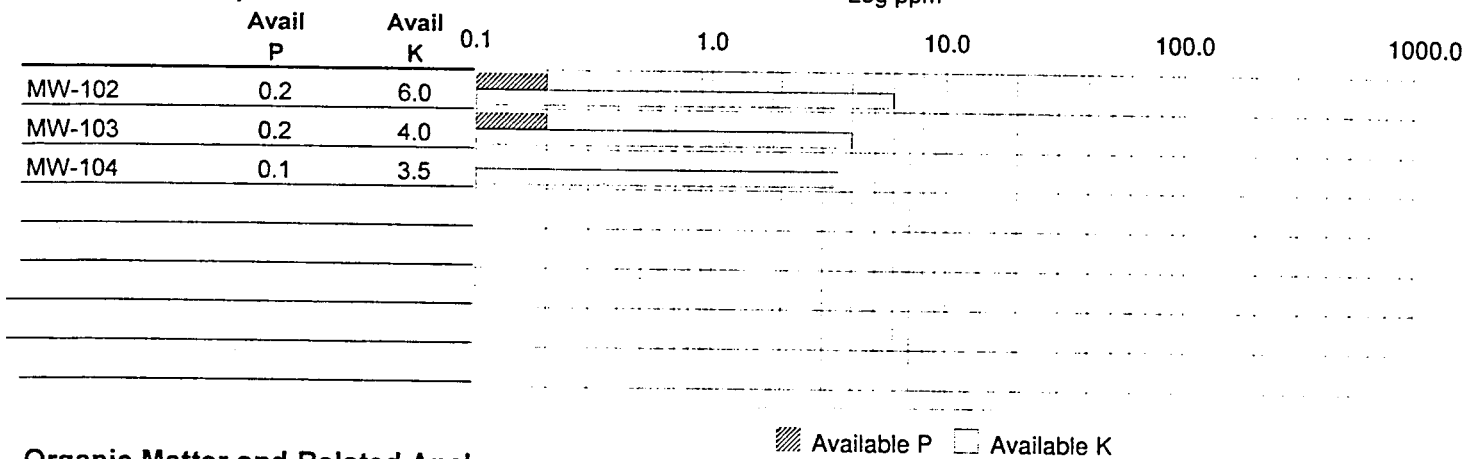
Assay conditons	Carbon source	% Carbon (v/v)	Incubation Temperature	Growth Conditions	Degrees of Freedom**	
					Totals	Degraders
MW-102	diesel	1.0	22	Aerobic	9	4
MW-102	weathered gas	1.0	22	Aerobic	9	4
MW-103	diesel	1.0	22	Aerobic	9	9
MW-103	weathered gas	1.0	22	Aerobic	9	9
MW-104	diesel	1.0	22	Aerobic	9	9
MW-104	weathered gas	1.0	22	Aerobic	9	9

cfu/ml = colony forming units per ml of groundwater  
Degrees of freedom is number of replicates minus one. This parameter is used in calculation of 95% confidence intervals.

**Section III - Nutrient Conditions**



**Available Phosphorus and Potassium**



**Organic Matter and Related Analyses**

Guideline Published Thresholds*		C:N	C:P
Wis Dept. Natural Resources		Below: 40	120
Nat'l Academy of Sciences		Below: 6	30

	% Organic Matter	TOC**	Calculated Ratios		Mg ppm	Ca ppm	Cation Exc Capacity Meq/100g	pH	SO4-S ppm	NO3-N ppm
			C:N	C:P						
MW-102	NR	NR	NR	NR	NR	NR	NR	7.5	NR	1.0
MW-103	NR	NR	NR	NR	NR	NR	NR	7.5	NR	<0.5
MW-104	NR	NR	NR	NR	NR	NR	NR	7.8	NR	<0.5

\* Sources: Natural Biodegradation as a Remedial Action Option - Interim Guidance, Wisconsin Dept of Nat Res. (1993) and In-situ Bioremediation: When Does it Work?, B. Rittman, Ed., National Academy of Sciences, 1993 p 117.

\*\* Estimated total organic carbon (expressed in ppm) calculated from % organic matter - See Methods.

n/a = Not applicable

Note To determine C:N and C:P ratios, phosphorus is expressed as available phosphorus, total organic carbon (TOC) is calculated from percent organic carbon and total organic nitrogen is calculated as total Kjeldahl nitrogen (TKN) minus ammonium nitrogen.



**APPENDIX H**

**MONITORING WELL ABANDONMENT FORMS**

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-1</u>	County <u>Milwaukee</u>	Original Well Owner (If Known) <u>Citgo Petroleum Corporation</u>	
SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N. R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If applicable)		Present Well Owner <u>as above</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>2316 Terminal Dr.</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Arlington Heights, IL 60065</u>	
Civil Town Name _____		Facility Well No. and/or Name (If Applicable) _____ WI Unique Well No. _____	
Street Address of Well <u>9235 N. 107th St.</u>		Reason For Abandonment <u>Borehole no longer in use</u>	
City, Village <u>Milwaukee, WI</u>		Date of Abandonment <u>10/9/95</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>4.50</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>01/30/87</u>		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Applicable Casing Left in Place? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If No, Explain _____	
<input checked="" type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input type="checkbox"/> Borehole  Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		Was Casing Cut Off Below Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>(5) Required Method of Placing Sealing Material</b>	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		<input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
Total Well Depth (ft.) <u>16.9</u> Casing Diameter (ins.) _____ (From ground surface)  Casing Depth (ft.) _____		<b>(6) Sealing Materials</b>	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown - If Yes, To What Depth? _____ Feet		For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input checked="" type="checkbox"/> Chipped Bentonite <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite - Cement Grout	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>16.9</u>		

(8) Comments: \_\_\_\_\_

Name of Person or Firm Doing Sealing Work <u>NORTH SHORE</u>	
Signature of Person Doing Work 	Date Signed <u>10/9/95</u>
Street or Route _____	Telephone Number ( ) _____
City, State, Zip Code _____	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Min. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-2</u>	County <u>Milwaukee</u>	Original Well Owner (If Known) <u>Citgo Petroleum Corporation</u>	
SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N. R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W		Present Well Owner <u>as above</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>2316 Terminal Dr.</u>	
Grid Location ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Arlington Heights, IL 60065</u>	
Civil Town Name _____		Facility Well No. and/or Name (If Applicable) _____ WI Unique Well No. _____	
Street Address of Well <u>9235 N. 107th St.</u>		Reason For Abandonment <u>Bore hole no longer in use</u>	
City, Village <u>Milwaukee, WI</u>		Date of Abandonment <u>10/9/95</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>&lt;5'</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>01/28/87</u>		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Applicable Casing Left in Place? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If No, Explain _____	
<input checked="" type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input type="checkbox"/> Borehole  Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		Was Casing Cut Off Below Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		<b>(5) Required Method of Placing Sealing Material</b>	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		<input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
Total Well Depth (ft.) <u>21.7</u> Casing Diameter (ins.) _____ (From ground surface)  Casing Depth (ft.) _____		<b>(6) Sealing Materials</b>	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input checked="" type="checkbox"/> Chipped Bentonite <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite - Cement Grout	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
CHIPPED BENTONITE	Surface	21.7		

(8) Comments: \_\_\_\_\_

Name of Person or Firm Doing Sealing Work <u>NORTH SHORE</u>	
Signature of Person Doing Work <i>[Signature]</i>	Date Signed <u>10/9/95</u>
Street or Route _____	Telephone Number ( ) _____
City, State, Zip Code _____	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	Distric/County
Reviewer/Inspector	
Follow-up Necessary	

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-3</u>	County <u>Milwaukee</u>	Original Well Owner (If Known) <u>Citgo Petroleum Corporation</u>	
SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N.R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If applicable)		Present Well Owner <u>as above</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>2316 Terminal Dr.</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Arlington Heights, IL 60065</u>	
Civil Town Name _____		Facility Well No. and/or Name (If Applicable) _____ WI Unique Well No. _____	
Street Address of Well <u>9235 N. 107th St.</u>		Reason For Abandonment <u>Borehole no longer in use</u>	
City, Village <u>Milwaukee, WI</u>		Date of Abandonment <u>10/9/95</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>1.85</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>01/30/87</u>  <input checked="" type="checkbox"/> Monitoring Well      Construction Report Available? <input type="checkbox"/> Water Well <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Drillhole <input type="checkbox"/> Borehole  Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____  Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock  Total Well Depth (ft.) <u>15.4</u> Casing Diameter (ins.) _____ (From ground surface)  Casing Depth (ft.) _____  Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No      Not Applicable Casing Left in Place? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If No, Explain _____  Was Casing Cut Off Below Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
		<b>(5) Required Method of Placing Sealing Material</b> <input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
<b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite - Cement Grout <input checked="" type="checkbox"/> Chipped Bentonite			

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>15.4</u>		

(8) Comments: \_\_\_\_\_

<b>Name of Person or Firm Doing Sealing Work</b> <u>NORTH SHORE</u>		<b>(10) FOR DNR OR COUNTY USE ONLY</b>	
Signature of Person Doing Work <u>[Signature]</u>	Date Signed <u>10/9/95</u>	Date Received/Inspected	District/County
Street or Route	Telephone Number ( )	Reviewer/Inspector	
City, State, Zip Code		Follow-up Necessary	



All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-4</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N. R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If applicable)		Present Well Owner <u>AS ABOVE</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>2316 TERMINAL DRIVE</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>ARLINGTON HEIGHTS, IL 60065</u>	
Civil Town Name _____		Facility Well No. and/or Name (If Applicable)	WI Unique Well No. _____
Street Address of Well <u>9235 N. 107<sup>TH</sup> STREET</u>		Reason For Abandonment <u>WELL NO LONGER IN USE</u>	
City, Village <u>MILWAUKEE WI</u>		Date of Abandonment <u>08/17/95</u>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

(3) Original Well/Drillhole/Borehole Construction Completed On  
(Date) 01/29/87

Monitoring Well  
 Water Well  
 Drillhole  
 Borehole

Construction Report Available?  
 Yes  No

Construction Type:  
 Drilled  Driven (Sandpoint)  Dug  
 Other (Specify) \_\_\_\_\_

Formation Type:  
 Unconsolidated Formation  Bedrock

Total Well Depth (ft.) 15.4 Casing Diameter (ins.) \_\_\_\_\_  
 (From ground surface)

Casing Depth (ft.) \_\_\_\_\_

Was Well Annular Space Grouted?  Yes  No  Unknown  
 If Yes, To What Depth? \_\_\_\_\_ Feet

(4) Depth to Water (Feet) < 5'

Pump & Piping Removed?  Yes  No  Not Applicable  
 Liner(s) Removed?  Yes  No  Not Applicable  
 Screen Removed?  Yes  No  Not Applicable  
 Casing Left in Place?  Yes  No  
 If No, Explain \_\_\_\_\_

Was Casing Cut Off Below Surface?  Yes  No  
 Did Sealing Material Rise to Surface?  Yes  No  
 Did Material Settle After 24 Hours?  Yes  No  
 If Yes, Was Hole Retopped?  Yes  No

(5) Required Method of Placing Sealing Material  
 Conductor Pipe-Gravity  Conductor Pipe-Pumped  
 Dump Bailer  Other (Explain) \_\_\_\_\_

(6) Sealing Materials For monitoring wells and monitoring well boreholes only

Neat Cement Grout  
 Sand-Cement (Concrete) Grout  
 Concrete  Bentonite Pellets  
 Clay-Sand Slurry  Granular Bentonite  
 Bentonite-Sand Slurry  Bentonite - Cement Grout  
 Chipped Bentonite

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>15.4</u>		

(8) Comments: \_\_\_\_\_

(9) Name of Person or Firm Doing Sealing Work  
MIDWEST ENGINEERING

Signature of Person Doing Work \_\_\_\_\_ Date Signed \_\_\_\_\_

Street or Route \_\_\_\_\_ Telephone Number ( ) \_\_\_\_\_

City, State, Zip Code \_\_\_\_\_

(10) FOR DNR OR COUNTY USE ONLY

Date Received/Inspected _____	District/Country _____
Renewer/Inspector _____	
Follow-up Necessary _____	

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-5</u>	County <u>Milwaukee</u>	Original Well Owner (If Known) <u>Citgo Petroleum Corporation</u>	
SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N.R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W (If applicable)		Present Well Owner <u>as above</u>	
Gov't Lot _____	Grid Number _____	Street or Route <u>2316 Terminal Dr.</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Arlington Heights, IL 60065</u>	
Civil Town Name _____		Facility Well No. and/or Name (If Applicable)   WI Unique Well No. _____   _____	
Street Address of Well <u>9235 N. 107th St.</u>		Reason for Abandonment <u>Borehole no longer in use</u>	
City, Village <u>Milwaukee, WI</u>		Date of Abandonment <u>10/9/95</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>01/28/87</u>	<b>(4) Depth to Water (Feet)</b> <u>1.69</u>
<input checked="" type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input type="checkbox"/> Borehole	Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Applicable Casing Left in Place? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If No, Explain _____
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Was Casing Cut Off Below Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____	<b>(5) Required Method of Placing Sealing Material</b> <input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock	<b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite-Sand Slurry <input type="checkbox"/> Bentonite-Cement Grout <input checked="" type="checkbox"/> Chipped Bentonite
Total Well Depth (ft.) <u>15.4</u> Casing Diameter (ins.) _____ (From ground surface)	
Casing Depth (ft.) _____	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>15.4</u>		

(8) Comments: \_\_\_\_\_

Name of Person or Firm Doing Sealing Work <u>NORTH SHORE</u>	
Signature of Person Doing Work <i>[Signature]</i>	Date Signed <u>10/9/95</u>
Street or Route _____	Telephone Number ( ) _____
City, State, Zip Code _____	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-6</u>	County <u>MILWAUKEE</u>	Original Well Owner (If Known) <u>CITGO PETROLEUM CORPORATION</u>	
SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N.; R. <u>21</u> E (If applicable)		Present Well Owner <u>AS ABOVE</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>2316 TERMINAL DRIVE</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>ARLINGTON HEIGHTS IL 60065</u>	
Civil Town Name <u>CITY OF MILWAUKEE</u>		Facility Well No. and/or Name (If Applicable)   WI Unique Well No. _____   _____	
Street Address of Well <u>9235 NORTH 107<sup>TH</sup> ST.</u>		Reason For Abandonment <u>WELL NO LONGER IN USE</u>	
City, Village <u>MILWAUKEE WI</u>		Date of Abandonment <u>08/17/95</u>	

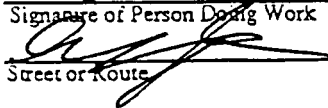
**WELL/DRILLHOLE/BOREHOLE INFORMATION**

<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>01/30/87</u>	<b>(4) Depth to Water (Feet)</b> <u>3.78</u>
<input type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input type="checkbox"/> Borehole  Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____	Pump & Piping Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Liner(s) Removed? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable Screen Removed? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Applicable Casing Left in Place? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If No, Explain _____  Was Casing Cut Off Below Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No
Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<b>(5) Required Method of Placing Sealing Material</b>
Formation Type: Unconsolidated Formation <input type="checkbox"/> Bedrock	<input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____
Total Well Depth (ft.) <u>15.4</u> Casing Diameter (ins.) _____ (From ground surface)  Casing Depth (ft.) _____	<b>(6) Sealing Materials</b> For monitoring wells and monitoring well boreholes only
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet	<input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input checked="" type="checkbox"/> Chipped Bentonite <input type="checkbox"/> Bentonite Pellets <input type="checkbox"/> Granular Bentonite <input type="checkbox"/> Bentonite - Cement Grout

Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>15.4</u>		

(8) Comments: \_\_\_\_\_

**(9) Name of Person or Firm Doing Sealing Work**  
MIDWEST ENGINEERING

Signature of Person Doing Work 	Date Signed
Street or Route	Telephone Number ( )
City, State, Zip Code	

**(10) FOR DNR OR COUNTY USE ONLY**

Date Received/Inspected	District/County
Renewal/Inspector	
Follow-up Necessary	

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-7</u>	County <u>Milwaukee</u>	Original Well Owner (If Known) <u>Citgo Petroleum Corporation</u>	
SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N.R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W		Present Well Owner <u>as above</u>	
(If applicable) Gov't Lot _____ Grid Number _____		Street or Route <u>2316 Terminal Dr.</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S. _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Arlington Heights, IL 60065</u>	
Civil Town Name _____		Facility Well No. and/or Name (If Applicable) _____   Unique Well No. _____	
Street Address of Well <u>9235 N. 107th St.</u>		Reason For Abandonment <u>Borehole no longer in use</u>	
City, Village <u>Milwaukee, WI</u>		Date of Abandonment <u>10/9/95</u>	

<b>WELL/DRILLHOLE/BOREHOLE INFORMATION</b>		<b>(4) Depth to Water (Feet)</b> <u>3.81</u>	
<b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>01/28/87</u>		<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Applicable <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Applicable <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
<input checked="" type="checkbox"/> Monitoring Well <input type="checkbox"/> Water Well <input type="checkbox"/> Drillhole <input type="checkbox"/> Borehole		Construction Report Available? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Construction Type: <input checked="" type="checkbox"/> Drilled <input type="checkbox"/> Driven (Sandpoint) <input type="checkbox"/> Dug <input type="checkbox"/> Other (Specify) _____		Was Casing Cut Off Below Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Sealing Material Rise to Surface? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Did Material Settle After 24 Hours? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Was Hole Retopped? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Formation Type: <input checked="" type="checkbox"/> Unconsolidated Formation <input type="checkbox"/> Bedrock		<b>(5) Required Method of Placing Sealing Material</b>	
Total Well Depth (ft.) <u>14.3</u> Casing Diameter (ins.) _____ (From ground surface)		<input checked="" type="checkbox"/> Conductor Pipe-Gravity <input type="checkbox"/> Conductor Pipe-Pumped <input type="checkbox"/> Dump Bailer <input type="checkbox"/> Other (Explain) _____	
Casing Depth (ft.) _____		<b>(6) Sealing Materials</b>	
Was Well Annular Space Grouted? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet		For monitoring wells and monitoring well boreholes only <input type="checkbox"/> Neat Cement Grout <input type="checkbox"/> Sand-Cement (Concrete) Grout <input type="checkbox"/> Concrete <input type="checkbox"/> Clay-Sand Slurry <input type="checkbox"/> Bentonite-Sand Slurry <input checked="" type="checkbox"/> Chipped Bentonite	

(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>3/8" CHIPPED BENTONITE</u>	<u>Surface</u>	<u>14.3</u>		

(8) Comments: \_\_\_\_\_

Name of Person or Firm Doing Sealing Work <u>NORTH SHORE</u>	
Signature of Person Doing Work <i>[Signature]</i>	Date Signed <u>10/9/95</u>
Street or Route _____	Telephone Number ( ) _____
City, State, Zip Code _____	

(10) FOR DNR OR COUNTY USE ONLY	
Date Received/Inspected	District/County
Reviewer/Inspector	
Follow-up Necessary	

All abandonment work shall be performed in accordance with the provisions of Chapters NR 111, NR 112 or NR 141, Wis. Admin. Code, whichever is applicable. Also, see instructions on back.

<b>(1) GENERAL INFORMATION</b>		<b>(2) FACILITY NAME</b>	
Well/Drillhole/Borehole Location <u>MW-8</u>	County <u>Milwaukee</u>	Original Well Owner (If Known) <u>Citgo Petroleum Corporation</u>	
(If applicable) SE 1/4 of NW 1/4 of Sec. <u>6</u> ; T. <u>8</u> N. R. <u>21</u> <input checked="" type="checkbox"/> E <input type="checkbox"/> W		Present Well Owner <u>as above</u>	
Gov't Lot _____ Grid Number _____		Street or Route <u>2316 Terminal Dr.</u>	
Grid Location _____ ft. <input type="checkbox"/> N. <input type="checkbox"/> S., _____ ft. <input type="checkbox"/> E. <input type="checkbox"/> W.		City, State, Zip Code <u>Arlington Heights, IL 60065</u>	
Civil Town Name _____		Factory Well No. and/or Name (If Applicable) _____ WI Unique Well No. _____	
Street Address of Well <u>9235 N. 107th St.</u>		Reason For Abandonment <u>Borehole no longer in use</u>	
City, Village <u>Milwaukee, WI</u>		Date of Abandonment <u>9/21/95</u>	

**WELL/DRILLHOLE/BOREHOLE INFORMATION**

<p><b>(3) Original Well/Drillhole/Borehole Construction Completed On</b> (Date) <u>01/29/87</u></p> <p><input checked="" type="checkbox"/> Monitoring Well      Construction Report Available?  <input type="checkbox"/> Water Well                      <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No  <input type="checkbox"/> Drillhole  <input type="checkbox"/> Borehole</p> <p>Construction Type:  <input checked="" type="checkbox"/> Drilled                      <input type="checkbox"/> Driven (Sandpoint)    <input type="checkbox"/> Dug  <input type="checkbox"/> Other (Specify) _____</p> <p>Formation Type:  <input checked="" type="checkbox"/> Unconsolidated Formation    <input type="checkbox"/> Bedrock</p> <p>Total Well Depth (ft.) <u>20.4</u> Casing Diameter (ins.) _____ (From ground surface)</p> <p>Casing Depth (ft.) _____</p> <p>Was Well Annular Space Grouted?    <input type="checkbox"/> Yes    <input type="checkbox"/> No    <input checked="" type="checkbox"/> Unknown If Yes, To What Depth? _____ Feet</p>	<p><b>(4) Depth to Water (Feet)</b> <u>5.97</u></p> <p>Pump &amp; Piping Removed?    <input type="checkbox"/> Yes    <input type="checkbox"/> No    <input checked="" type="checkbox"/> Not Applicable  Liner(s) Removed?            <input type="checkbox"/> Yes    <input type="checkbox"/> No    <input checked="" type="checkbox"/> Not Applicable  Screen Removed?              <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No    <input type="checkbox"/> Not Applicable  Casing Left in Place?        <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No  If No, Explain _____</p> <p>Was Casing Cut Off Below Surface?    <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No  Did Sealing Material Rise to Surface?    <input checked="" type="checkbox"/> Yes    <input type="checkbox"/> No  Did Material Settle After 24 Hours?    <input type="checkbox"/> Yes    <input checked="" type="checkbox"/> No  If Yes, Was Hole Retopped?            <input type="checkbox"/> Yes    <input type="checkbox"/> No</p> <p><b>(5) Required Method of Placing Sealing Material</b>  <input checked="" type="checkbox"/> Conductor Pipe-Gravity    <input type="checkbox"/> Conductor Pipe-Pumped  <input type="checkbox"/> Dump Bailer                      <input type="checkbox"/> Other (Explain) _____</p> <p><b>(6) Sealing Materials</b>                      For monitoring wells and monitoring well boreholes only</p> <p><input type="checkbox"/> Neat Cement Grout  <input type="checkbox"/> Sand-Cement (Concrete) Grout  <input type="checkbox"/> Concrete                                      <input type="checkbox"/> Bentonite Pellets  <input type="checkbox"/> Clay-Sand Slurry                            <input type="checkbox"/> Granular Bentonite  <input type="checkbox"/> Bentonite-Sand Slurry                      <input type="checkbox"/> Bentonite - Cement Grout  <input checked="" type="checkbox"/> Chipped Bentonite</p>
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(7) Sealing Material Used	From (Ft.)	To (Ft.)	No. Yards, Sacks Sealant or Volume	Mix Ratio or Mud Weight
<u>CHIPPED BENTONITE</u>	<u>Surface</u>	<u>20.4</u>		

(8) Comments: \_\_\_\_\_

**(9) Name of Person or Firm Doing Sealing Work**  
Midwest Engineering Services

Signature of Person Doing Work 	Date Signed
Street or Route	Telephone Number (    )
City, State, Zip Code	

**(10) FOR DNR OR COUNTY USE ONLY**

Date Received/Inspected	District/County
Renewer/Inspector	
Follow-up Necessary	