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TIME OIL CO.

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P.O. BOX 24447

SEATTLE, WA 98199-1233
SEATTLE, WA 98124-0447

UST # 4108

December 8, 1999

Mr. Chung Yee
Washington State Department of Ecology
Central Region
15 West Yakima Avenue
Yakima, WA 98902-3387

RE: Transmittal of Remedial Investigation/Feasibility Study Report
Time Oil Co. Property 01-068; Valley View Market
107 W. Lincoln Avenue; Sunnyside, Washington

Dear Mr. Yee,

Please find enclosed herewith a copy of the above referenced document produced for Time Oil Co. by MAXIM Technologies, Inc. (MAXIM). The following paragraphs present a brief site history, a short synopsis of conditions encountered during, and recommendations associated with, the remedial investigation and feasibility study, and our plans for future work. The enclosed report contains a more detailed description of the project. Please contact me should you require any additional information.

Site History:

Time Oil Co. entered into a Special Purpose Agreement (SPA) with the site's owner in 1972. The SPA allowed Time Oil Co. to install and operate gasoline dispensing facilities while property ownership would be maintained by other parties. Following execution of the SPA, Time Oil Co. installed two underground storage tanks (USTs) and a single dispenser island in the northeastern area of the site. Time Oil Co. has continuously operated the USTs since 1972. There is no known history of fuel dispensing activities at the site prior to installation of the Time Oil Co. UST system.

Evidence of a hydrocarbon impact was first discovered beneath the site during installation of a cathodic protection system in October 1996. Hydrocarbon affected soils were observed in several cathodic protection borings located around the USTs and dispenser island during anode installation. An initial assessment of environmental conditions consisting of the drilling of fourteen drive point borings, installation of two vapor monitoring points, installation of eight monitoring wells, and initial remedial testing was conducted in February and March 1997. Results of the initial site assessment activities indicated that the extent of soil and groundwater contamination on-site, and off-site beneath First Street (to the east of the site), had been fully defined. However, the downgradient extent of affected groundwater was not defined.

Groundwater monitoring activities conducted following the initial site assessment activities periodically detected a thin layer of free product in monitoring wells MW-4 and MW-6, confirmed definition of the

upgradient and sidegradient limits of affected groundwater, and identified a relatively steep groundwater gradient flowing towards the southeast.

An interim vapor extraction system was installed on-site in August 1997. The interim system consisted of a vacuum blower connected to vapor point VP-1 and monitoring wells MW-3, MW-4, and MW-5 via subsurface piping. The interim system operated for approximately twelve hours per day between August 1997 and July 1998. The system extracted soil vapor only from well MW-4 between August 1997 and April 1998. In April 1998 activated carbon vessels were installed to treat the extracted vapors and the system was modified to extract soil vapor from all extraction wells. The interim system was shut down in July 1998 because the carbon treatment vessels had become fully saturated, the interim air discharge permit was due to expire soon, and groundwater monitoring data indicated that the system was having no material effect on reducing groundwater impacts.

In June 1998 several soil borings were drilled upon the Washington Hill Cellars property located southeast of the site to collect grab groundwater samples to estimate the downgradient limits of affected groundwater. Analytical data from the grab groundwater samples appeared to define the full extent of downgradient groundwater impacts; thus, four monitoring wells were installed in August 1998 to provide permanent downgradient plume delineation monitoring points. Analytical results from groundwater samples collected during quarterly groundwater monitoring events conducted since August 1998 have indicated that the full extent of impacted groundwater has remained defined since that time.

Subsequent to the completion of the off-site assessment, the project was re-bid for two years of quarterly groundwater monitoring, performance of the remedial investigation and feasibility study (RI/FS), remediation system design, and corrective action plan (CAP) development. The enclosed report documents conditions encountered during, and recommendations drawn from, the RI/FS. Groundwater monitoring reports are submitted under separate cover.

Additional Well Installation:
Monitoring wells MW-13 through MW-16 and air sparging well SW-1 were installed on April 13 and 14, 1999. Monitoring wells MW-13 through MW-15 were installed in the southeastern area of the site upon the Washington Hills Cellars property to provide appropriate data collection points for use during the upcoming aquifer tests (the aquifer tests were planned to utilize nearby existing monitoring well MW-9 as the extraction point). Wells SW-1 and MW-16 were installed in the northwestern area of the site to respectively provide an air sparging injection well and nearby monitoring point for use during air sparging testing.

Well borings for MW-13 through MW-15 were drilled to total depths of 25 feet below ground surface (bgs); two-inch diameter PVC well casing, screened between approximate depths of 10 and 25 feet bgs, was installed in each boring. The well boring for MW-16 was drilled to a total depth of 20 feet bgs; two-inch diameter PVC well casing, screened between approximate depths of 10 and 20 feet bgs, was installed in the boring. The well boring for SW-1 was drilled to a total depth of 26 feet bgs; two-inch diameter PVC well casing, screened between approximate depths of 23.5 and 26.0 feet bgs, was installed in the boring. Well locations are shown on Figure 2 of the enclosed report.

Soil Analytical Testing and Results:
With the exception of well MW-16, soil samples were collected from each boring at five foot intervals. Selected soil samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-gasoline) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Concentrations of the target analytes exceeding MTCA Method A Cleanup Levels – Soil were detected in soil samples collected from borings MW-13, MW-14, and SW-1. Since the wells were installed either within, or near, areas of known groundwater contamination, the soil analytical program focused on determining the nature and extent of soil

contamination in the smear zone located near the groundwater surface. Results of analytical testing determined that the most heavily affected soil horizon appears present at depths of 15 to 21 feet bgs upon the Valley View Market property and at depths of 17 to 21 feet off-site on the Washington Hills Cellars property.

Groundwater Analytical Testing and Results:
Groundwater samples were recovered from wells MW-14 through MW-16 during RI/FS activities. Free product was present in well MW-13; thus, this well was not sampled. Recovered groundwater samples were analyzed for TPH-gasoline and BTEX. Petroleum hydrocarbon impacts exceeding MTCA Method A Cleanup Levels – Groundwater were detected in each of the samples collected from wells MW-14 through MW-16. Wells MW-13 through MW-16 have been incorporated into the quarterly groundwater monitoring program.

Remedial Testing:
Vapor Extraction Testing:
Individual one hour duration vapor extraction tests were performed on wells MW-3 through MW-5 in order to confirm previous vapor extraction test data and further evaluate vapor extraction as a potentially applicable remedial technology. A fourth test was conducted with all three wells extracting soil vapor simultaneously (combined test). The test wells were connected to a 50-gallon moisture knock-out tank and a Rotron DR707 extraction blower during the tests. Extracted vapors were discharged directly to the atmosphere during the tests. Induced vacuums of approximately 60 inches of water (IOW) during the individual tests and 70 IOW during the combined test were applied to the extraction wells. Vacuum responses were measured in nearby monitoring wells to evaluate effective radii of influence during the tests. For test evaluation purposes, the effective radius of influence was defined as the lineal distance from the extraction well to an estimated point where at least 1% of the vacuum applied to the extraction well is measured.

Vapor flow rates of approximately 24 to 54 cubic feet per minute (cfm) were observed during the individual tests and a flow rate of approximately 280 cfm was observed during the combined test. Effective vapor extraction radii of influence measuring approximately 15 feet were documented during the tests. Monitoring of organic vapor concentrations in the extracted air streams indicated moderate concentrations of petroleum hydrocarbons.

Results of the vapor extraction tests indicate that the low permeability of site soils reduces vapor extraction flow rates and effective radii of influence. These results suggest that a significantly higher vacuum source would be necessary to increase the effective radius of influence and air flow rates to more feasible values.

Air Sparging Testing:
A 4.5-hour groundwater sparge test was performed utilizing well SW-1 as the air injection well. A portable industrial air compressor was used to inject air through well SW-1, which is screened from 23.5 to 26 feet below ground surface (approximately 7.5 to 10 feet below the groundwater surface). Air injection pressures ranged between 10 and 15 pounds per square inch (psi) and injection flow rates ranged between 1 and 2 cfm during the tests. Soil vapor was simultaneously extracted from wells MW-3 through MW-5 at a combined flow rate of approximately 280 CFM during the sparge test. The simultaneous vapor extraction was conducted in order to capture hydrocarbon vapors mobilized from affected groundwater, and to estimate the operating parameters of a combined air sparging/vapor extraction remediation system.

Wells MW-1 through MW-7 and MW-16 were monitored before and during the test to assess test related changes in dissolved oxygen, temperature, conductivity, pH, and depth to water or product. Groundwater samples were collected from wells MW-2, MW-3, MW-16 and SW-1 both before and after the test to assess sparging related changes in groundwater contaminant concentrations. Hydrocarbon concentrations

in the extracted air stream were also monitored with a photoionization detector (PID) during the test. Samples of extracted soil vapor were collected at the initiation and termination of the sparging test.

With the exception of depths to water in all wells, and dissolved oxygen concentrations in well MW-16, no statistically significant changes were observed in the test monitoring parameters. Dissolved oxygen concentrations in well MW-16 increased from 1.96 mg/L before the test, to a maximum of 5.69 mg/L, before decreasing to 3.98 mg/L at the end of the test. Water levels exhibited a general rise in all monitored wells. The increases in groundwater levels were inversely proportional to the distance from the injection well. The maximum rise of 2.96 feet was observed in well MW-16 (10 feet from SW-1) and the smallest rise of 0.03 feet was observed in well MW-7 (75 feet from SW-1).

No statistically significant changes were observed in groundwater analytical data from pre- and post-test groundwater samples collected from wells MW-2, MW-3, MW-16 and SW-1. Likewise, soil vapor concentrations observed in samples collected from the vapor extraction system at the initiation and conclusion of the sparging test were very similar. Although an increased DO concentration was observed in well MW-16, the increase did not approach saturation. DO saturation would be expected in MW-16, located only 10 feet from the injection well, should air sparging present a viable remedial technology for the site.

The high air injection pressure, low air injection flow rate, lack of positive responses observed in the monitoring points, and insignificant changes between pre- and post-test analytical data indicate that air sparging would not be a viable remediation method for impacted groundwater beneath the site.

Bioslurping Aquifer Testing:
Bioslurping is a combined groundwater, free product, and soil vapor extraction method in which simultaneous extraction of all three media is conducted through an extraction tube or "stinger" installed inside the extraction well. The stinger extends from the wellhead to a point located below the product and/or groundwater surface. The wellhead is sealed and a high vacuum (typically 10 to 30 inches of mercury) is applied through the stinger using either a positive displacement blower or a liquid ring pump. As a result of the application the high vacuum, standing groundwater is quickly evacuated from the extraction well to the depth of the stinger and an equilibrium is reached where groundwater and/or free product and soil vapor are simultaneously extracted. After reaching equilibrium, effluent from the extraction well typically resembles a mist. Application of a high vacuum to the extraction well results in increased groundwater, product, and soil vapor extraction rates. Vapor extraction radii of influence are also typically significantly expanded by application of higher vacuums. This technology, also known as high vacuum dual-phase extraction, is best suited to sites with heavily impacted groundwater and/or free product present in low permeability soils.

A three phase bioslurping aquifer test was conducted between May 11 and 13, 1999 utilizing 4-inch diameter well MW-9 as the extraction point. The test was conducted to evaluate the potential applicability of bioslurping as a remediation method; assess groundwater, product and soil vapor recovery rates; assess groundwater and vapor extraction radii of influence; and collect hydrogeologic data for input into a groundwater modeling computer program. These data were collected to assist remedial design efforts. Groundwater draw-down was monitored in all nearby wells, with an emphasis on MW-13 through MW-15.

An Atlantic Fluidics model A-130 liquid ring pump was used to apply the vacuum to the extraction well. Extracted groundwater and soil vapor were separated in a moisture-water separator located on the liquid ring pump. Extracted soil vapors were discharged through a 1,000-pound vapor phase activated carbon vessel and a 30-foot exhaust stack. Extracted groundwater was temporarily stored in a 21,000-gallon above ground tank, treated on-site by air sparging, then discharged through a liquid phase activated carbon vessel to an industrial waste water treatment system under a temporary discharge permit issued by the Port

of Sunnyside. Vapors generated during sparging activities were discharged through a vapor phase activated carbon vessel. The bioslurping extraction and treatment system schematic diagram is presented on Figure 4 of the enclosed report.

The first phase of the bioslurping test consisted of a one hour product skimming test in which the bottom of the stinger was placed at the product/groundwater interface and a gate valve located on the wellhead was opened to allow for the introduction of atmospheric air to the well casing. The first phase of the test was conducted to evaluate potential product recovery rates. The product recovery rate dropped to a negligible level in a very short time frame; thus, the second phase of the test was initiated after only one hour. The second phase of the test involved closing the gate valve to apply a higher vacuum to the extraction well. The second phase of the test was conducted for approximately 27 hours. The third phase of the test involved lowering the stinger to a point approximately 6.2 feet below the groundwater surface to evaluate groundwater draw-down and the extent of the groundwater capture zone. The third phase of the test was conducted for approximately 24 hours.

Monitoring efforts during the bioslurping test involved measuring groundwater/product levels and induced vacuums in nearby monitoring wells; measuring the vacuum applied to the extraction well, groundwater extraction rate, and vapor extraction rate; monitoring organic vapor concentrations, carbon monoxide (CO), carbon dioxide (CO_2), oxygen (O_2), and percentage of the lower explosive limit (%LEL) in the extracted soil vapor stream; and monitoring off-gas organic vapor concentrations downstream of the 1,000-pound vapor phase activated carbon vessel. Groundwater samples were also collected from monitoring wells MW-8, MW-9, MW-10, MW-13, MW-14, MW-15, and the production well located on the Washington Hill Cellars property prior to and following the test. Vapor samples were also collected from the extracted soil vapor stream at the initiation and completion of each phase of the test. Groundwater samples were analyzed for TPH-gasoline and BTEX and soil vapor samples were analyzed for total non-methane hydrocarbons and hydrocarbon speciation.

Results of analytical testing of vapor samples indicated that significant amounts of hydrocarbons could be recovered using the bioslurping method. Results of groundwater analyses did not appear to demonstrate any reliable trends. These results may be due to the presence of free product within the test area. It is expected that long term operation of a bioslurping system would result in removal of the free product and significant reductions in groundwater contaminant levels.

The bioslurping test data was entered into the BIOSLURP™ computer modeling program to evaluate whether bioslurping could be used as an appropriate remedial method to address the entire area of affected soils and groundwater utilizing a feasible number of extraction wells. Several combinations of potential extraction wells and system operating parameters were evaluated using the computer model. Modeling efforts indicated that the site could be appropriately remediated by using the bioslurping technology to extract groundwater, product, and soil vapor from nine recovery wells. Operating parameters would include placing the stingers at a depth of 5 feet below the groundwater surface and applying vacuums of approximately 3.5 inches of mercury to each extraction well. Individual well groundwater flow rates of approximately 1.3 gpm would be realized as a result of these operating parameters. Figure 10 of the enclosed report displays the expected area of groundwater drawdown associated with operation of the proposed bioslurping system.

Conclusions/Future Work:

Results of the RI/FS and previous site assessment work indicate that the extent of hydrocarbon containing soil and groundwater has been fully defined, and that these impacts are present within an area which can be effectively influenced by installing a bioslurping remediation system consisting of nine extraction wells. The RI/FS indicated that vapor extraction and air sparging are not feasible remediation methods for the site.

A draft remediation system design has been produced and will be incorporated into a Corrective Action Plan (CAP) once finalized. One remaining outstanding issue involves whether treated groundwater can be discharged to the City of Sunnyside sanitary sewer system or whether an NPDES permit will be required to discharge treated water through the storm water run-off system. We are currently discussing the draft design with officials of Washington Hills Cellars, the City of Sunnyside, and Ecology's waste water discharge permitting division. Once any potential concerns of Washington Hills Cellars and/or the City of Sunnyside have been appropriately addressed, and the treated water discharge permitting issue has been resolved with Ecology, the CAP will be produced and submitted to your office. A complete description of the system, its proposed operating parameters, and remedial monitoring methods will be contained in the forthcoming CAP. We expect that the remediation system will be installed and commence operation during the Spring and early Summer of 2000.

Quarterly groundwater monitoring will continue throughout 1999 and 2000.

If you have any questions or comments concerning this letter, the enclosed report, or information contained within either, I can be reached at (206) 286-6457.

Sincerely,

Scott B. Sloan, R.G.
Geologist

Encl: Remedial Investigation/Feasibility Study Report

cc: Mr. John Probst – Washington Hills Cellars
Mr. Gene St. Godard – MAXIM Technologies, Inc. (w/o enclosure)

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UST # 4108

REMEDIAL INVESTIGATION/ FEASIBILITY STUDY TIME OIL PROPERTY NO. 01-068 SUNNYSIDE, WASHINGTON

Prepared for:

Time Oil Company
2737 West Commodore Way
Seattle, Washington 98199-1233

Prepared by:

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November 1999

99-04808

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY
TIME OIL PROPERTY 01-068
107 WEST LINCOLN AVENUE
SUNNYSIDE, WASHINGTON

EXECUTIVE SUMMARY

The following report presents the results of a Remedial Investigation/Feasibility Study performed by Maxim Technologies, Inc.® (Maxim) for Time Oil Company on the subject property located at 107 West Lincoln Avenue in Sunnyside, Washington. Our work consisted of the following: 1) advancing five borings and installing one air sparging well and four groundwater monitoring wells; 2) submitting collected soil samples for analysis; 3) performing a vapor extraction test on wells MW-3, MW-4 and MW-5; 4) performing a bioslurping test on well MW-9; 5) performing an air sparging test on well SW-1; 6) reviewing all field data including modeling the bioslurping data; and 7) preparing this report. This work was based on our environmental services proposal dated January 1999, submitted to Mr. Scott Sloan of Time Oil Company. All work was conducted upon receipt of written authorization by Time Oil Company. The following summary presents significant findings detailed in this report:

- The well installation program consisted of advancing five borings, collecting soil samples and installing one 2-inch diameter air sparging well and four 2-inch diameter groundwater monitoring wells.

- Selected soil samples from the borings indicated the presence of elevated levels of Gasoline Range Petroleum Hydrocarbons (GRPH) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) in the subsurface soils on both the Valley View Mart and The Washington Hills Cellars properties. GRPH impacts to soil were limited to samples submitted from borings MW-13 and SW-1. At least one of the BTEX compounds was detected in at least one of the samples submitted from each of the borings. MTCA Method A cleanup levels for soil were exceeded for GRPH in samples submitted from borings SW-1 and MW-13. MTCA Method A cleanup levels for soil were exceeded for at least one of the samples submitted for benzene from borings MW-13, MW-14 and SW-1 and for xylenes in borings MW-13 and SW-1.

- Water level measurements collected on May 10, 1999 from the sixteen groundwater monitoring wells exhibited groundwater at depths of 17.53 to 20.90-feet below the top of the well casing in the new wells and ranged from 13.01 to 21.22-feet below the top of casings in the existing wells. Groundwater elevations ranged from 728.49 to 747.27-feet in all wells. LNAPL was detected in wells MW-6, MW-9 and MW-13 with thicknesses ranging from <0.01 to 1.96-feet. A groundwater gradient of 0.0715 ft/ft was calculated for the Valley View Mart property and 0.0410 for the Washington Hills Cellars property with a flow trending to the south-southeast

- A 52 ½-hour bioslurping test was performed using the existing well MW-9 as the extraction point. The test was divided into three phases as follows: phase one was run for the period of 1-hour for product recovery with the stinger at the groundwater interface and the well head open to the atmosphere; phase two was run for the period of 27 ½-hours with the stinger at the groundwater interface and the wellhead closed to the atmosphere; and phase three was run for a period of 24-hours with the stinger lowered 6.2-feet below the groundwater table and the wellhead closed to the atmosphere. Data interpretation using the BIOSLURP Model indicated that this technology is a feasible remedial alternative. Remediation of chemicals of concern can be accomplished using 9 recovery wells with the stingers placed 5-feet below the groundwater/air interface. An imposed vacuum of 4-feet of water and a groundwater recovery rate of 1.3 gpm will be applied at each bioslurping well utilized in the remediation system.

- A 4-hour in-situ air sparging test was performed on well SW-1. Groundwater levels, dissolved oxygen, temperature, conductivity and pH were monitored in the surrounding groundwater monitoring wells in addition to applied vacuum or pressure at the well head throughout the duration of the test. The existing vapor extraction system was operated and monitored for organic vapor concentrations using a PID. Air samples from the extraction system off-gas stack were collected just after the initiation and just prior to the termination of the test. Analysis of the samples indicated no significant increase of petroleum hydrocarbons was observed as a result of the air injection.

- Groundwater analytical results for samples collected from selected wells before and after air sparge testing indicated a general increase in dissolved concentrations of purgeable hydrocarbons, benzene, toluene, ethylbenzene, and xylenes within the observations wells. However, within the air injection wells used for pilot testing, a general decrease in hydrocarbon constituents was observed. The increase in hydrocarbons is typically the result of the mobilizing of hydrocarbons from the smear zone (located at the 12.0 to 12.5-foot depth on the subject property and, transferring these hydrocarbons into solution. The decreases in the air injection wells indicate a transfer of the dissolved phase volatile hydrocarbons into vapor phase within the sparge well radius of influence. Analysis of the collected field data indicated that in-situ air sparging would not be an effective remedial method at the subject site.

- Four 1-hour vapor extraction tests were performed on wells MW-3, MW-4, MW-5 and the three wells combined. The existing manifold and blower configuration was utilized for the test. The test results indicate that a 15 to 20-foot effective radius of influence could be achieved at an applied vacuum of 60 to 70-inches of water (IOW). Analytical results from air samples collected during the test indicated that only moderate concentrations of petroleum hydrocarbon vapors were being removed and may be attributed to volatilization of the free product within the wells. The low permeability of the native soils tends to limit airflow with preferential flow exhibited in the observed thin sand layers. The testing tends to indicate that a significantly larger vacuum source is necessary to effectively use this remedial technology.

- Soil generated from the investigation activities was temporarily stored in seven 55-gallon drums at the southern end of the Valley View Mart property. The soils were transported off-site to the Remtech facility in Spokane, Washington on July 7, 1999 for thermal remediation of the petroleum hydrocarbon impacts. Liquid generated during the investigation and pilot testing were sparged, filtered through carbon and discharged to the Port of Sunnyside collection system in accordance with a temporary discharge permit.

This summary is presented for introductory purposes and should only be used in conjunction with the full text of this report. Our interpretations of subsurface conditions, installation of groundwater monitoring wells, vacuum test, and laboratory analysis are included in the text of this report. Analytical laboratory testing procedures and test certificates are included in the appendix of this report.

1.0 INTRODUCTION

Maxim Technologies, Inc.® (Maxim) performed a focused Remedial Investigation/Feasibility Study (RI/FS) for Time Oil Company at the subject property located at 107 West Lincoln Avenue and the Washington Hills Cellars property located to the east across First Avenue, in Sunnyside, Washington (Figure 1). The fieldwork was completed by our field representatives in April and May, 1999 in order to determine the most feasible alternative to mitigate the gasoline impacts in soil and groundwater at the subject site and on the Washington Hills Cellars property located east and southeast of the site. The following report presents the results of our focused RI/FS.

The scope of work for this study consisted of the following:

- Contact a one-call utility locating service to clear underground utilities at drilling locations;
- Advancing five soil borings to depths of approximately 20 to 30-feet below the existing site grade and collecting soil samples at a minimum 5-foot interval starting at a depth of 5-feet below site grade;
- Install one 2-inch air sparging and four 2-inch groundwater monitoring wells in the exploratory soil borings at the site. Wells MW-13, MW-14 and MW-15 were completed to a depth of approximately 25-feet below grade and screened from 10 to 25-feet, well MW-16 was completed to a depth of approximately 20-feet below grade and was screened from 10 to 20-feet below grade and well SW-1 was completed to approximately 26-feet below grade and screened from 23.5 to 26-feet below grade;
- Submit selected soil samples to North Creek Analytical, Inc. for analysis of:
  Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) by EPA Method 8020, and
  Gasoline Range Petroleum Hydrocarbons (GRPH) by Washington State Department of Ecology (Ecology) Method WTPH-G.
- Conduct four 1-hour vapor extraction tests on various combinations of existing site wells utilizing the existing manifold and blower located in the remedial compound at the site;
- Conduct a 32-hour bioslurping test consisting of three separate phases utilizing well MW-9 as the extraction point;
- Collect groundwater samples from selected wells before and after the bioslurping test and submit them for analysis of:
  GRPH by Ecology Method WTPH-G, and
  BTEX by EPA Method 602.
- Conduct a 4 ½-hour in-situ air sparging test utilizing SW-1 as the air injection point;
- Collect groundwater samples from selected wells before and after the in-situ air-sparging test and submit them for analysis of:
  GRPH by Ecology Method WTPH-G,
  BTEX by EPA Method 602, and
  Total dissolved metals Calcium, Iron, Magnesium, Arsenic, Chromium, Lead, Manganese and Zinc by EPA Method 6000/7000.

- Collect air samples during intervals of the vapor extraction, bioslurping and in-situ air sparging testing and submit them for analysis of:
  Speciated hydrocarbons by EPA Method TO-14, and
  Total Non-Methane Hydrocarbons (TNMHC) by EPA Method TO-12.
- Evaluate the collected data and prepare this report.

This report has been prepared for the exclusive use of Time Oil Company and their agents for specific application to this project site in accordance with generally accepted environmental assessment practices and the constraints of our approved scope of work. No other warranty, express or implied is made. In the event other information regarding site conditions becomes known, or if there are any changes to the conditions on the existing site or nearby properties, the conclusions of this report should be reviewed and, if necessary, revised by our office to reflect updated site information.

2.0 SITE DESCRIPTION

Time Oil Co. Property No. 01-068 is located at 107 West Lincoln Avenue in Sunnyside, Washington. The property is located on the southwest corner of First Avenue and West Lincoln Street and consists of a convenience store (Minimart), one dispenser island, and two underground storage tanks (USTs) covered with a concrete slab. The property is a relatively level, irregular shaped parcel, approximately 1/3- acre in size that is bordered to the east by First Avenue, the south and west by single family housing, and north by West Lincoln Avenue. The property currently is an active convenience store and retail fuel facility. Time Oil Company has operated the UST system at the Valley View Market under a Special Purpose Agreement since 1972. The property is currently owned by another party, and there is no known history of gasoline storage or sales at the property prior to installation of the Time Oil Company UST system. Site features are presented on Figure 2, Site and Exploration Plan.

3.0 SITE HISTORY

The following is a summary of the assessment activities as identified in the Alisto (June 1997) and Wohlers (October 1998) reports. Hydrocarbon contamination was first detected in September 1996 while Time Oil Company was installing cathodic protection at the site. During these activities, approximately two cubic yards of soil were excavated during the installation of the seven cathodic protection anodes. Analysis verified the presence of hydrocarbons at concentrations of 8.17 to 4050 milligrams per kilogram (mg/kg) in two samples taken from the excavated soil stockpile. Benzene, toluene, ethylbenzene, and total xylenes (BTEX) were detected at concentrations of 2.27, 31.2, 37.5 and 242 mg/kg, respectively in one of the soil samples. The other sample did not contain concentrations above the laboratory detection limits.

Initial site assessment activities were performed at the site between February and March 1997 by Alisto. These activities included a drivepoint assessment consisting of a total of 16 borings both onsite and to the east within the First Street right-of -way. In two of the borings, one-inch diameter vapor monitoring points (VP-1 and VP-2) were completed for future remedial work. During this initial phase of the assessment, light non-aqueous phase liquid (LNAPL) was

encountered in drive points DP-5 and DP-6, both driven on the subject site. Based on the drivepoint assessment, a total of eight monitoring wells were installed, five within the service station property and three on the east side of First Street. Monitoring wells MW-3, MW-4 and MW-5 were completed as 4-inch diameter wells and wells MW-1, MW-2, MW-6, MW-7 and MW-8 were completed as 2-inch diameter monitoring wells.

During groundwater monitoring performed in March of 1997, groundwater was determined to flow from the property in a southeasterly direction under an apparent hydraulic gradient of 0.07 ft/ft. Groundwater containing dissolved hydrocarbons in excess of the Model Toxics Control Act (MTCA) Method A cleanup levels were found in wells MW-3, MW-4, MW-5 and MW-6. Remedial testing was also conducted in March 1997, which consisted of an aquifer bail down test and vapor extraction testing. The bail down testing indicated an average groundwater flow velocity of 37.20 feet per year beneath the site. Vacuum test determined that a radius of influence of 21 to 25 feet was obtainable at 46 inches of water and 18 cubic feet per minute (cfm) flow. Air samples collected during the vapor extraction tests on wells MW-3 and MW-4 contained concentrations of total non-methane hydrocarbons (TNMH) of 4,600 and 450 parts per million per unit volume (ppmv), respectively. BTEX compounds at concentrations of 57, 100, 15 and 62 ppmv, respectively were detected in the air sample from MW-3. Only benzene and toluene were detected in the sample from MW-4 at concentrations of 15 and 16 ppmv, respectively.

In August 1997, a soil vapor extraction system was installed at the site and was connected through a manifold to MW-3, MW-4, MW-5 and VP-2. A Rotron EN 707 regenerative blower was installed near the southeastern corner of the site structure to withdraw vapors from the wells. The extracted vapors were initially discharged without treatment but were later treated prior to discharge using Granulated Activated Carbon (GAC).

In June and July of 1998, Wholers Environmental conducted additional assessment activities at the site. Drivepoint sampling was attempted on the Washington Hills Cellars property in June, but due to impenetrable soil conditions the probe could only penetrate a few feet below the ground surface. Eleven soil borings were advanced in July on the Washington Hills Cellars property to depths of 25 to 30-feet below ground surface or approximately 3 to 5-feet below the groundwater table. In each of the borings, temporary well points consisting of 1-inch diameter PVC were installed. Groundwater samples were collected from each of the well points, which were abandoned after sampling by removing the casing and grouting the holes. Elevated TPH-G and BTEX concentrations above MTCA Method A cleanup levels for groundwater were observed in the groundwater sample from boring B-1. Concentrations of at least one of the BTEX compounds were detected in groundwater samples from borings B-2, B-3, B-4, B-5 and B-9 with benzene concentrations in excess of MTCA Method A cleanup levels in the samples from B-2 and B-9. TPH-G/BTEX compounds were not detected in the samples from borings B-8, B-10 and B-11.

Based on the analytical results obtained from the well points, four monitoring wells were installed on the Washington Hills Cellars property in August of 1998. Well MW-9 was constructed as a 4-inch diameter well and MW-10, MW-11 and MW-12 were constructed as 2-inch wells. LNAPL was not measured in any of these wells. Elevated TPH-G and BTEX

compound concentrations of 22,000, 4,300, 5,300, 310 and 2,100 parts per billion (ppb), respectively were observed in the groundwater sample collected from well MW-9. Detectable concentrations of toluene below MTCA Method A cleanup levels for groundwater were observed in the samples from wells MW-10 and MW-11, all other BTEX and TPH-G compounds were below detection limits for these samples. TPH-G/BTEX compounds were not detected in the sample from well MW-12.

Quarterly groundwater monitoring has been conducted at the site since the assessment activities were initiated in 1997. LNAPL up to 0.25 feet thick has been gauged in wells MW-4 and MW-6 during several quarterly groundwater sampling events. The groundwater plume, which has been estimated to be approximately 275 feet long and 80 feet wide, crosses beneath First Avenue onto the Washington Hills Cellar property. The groundwater appears to have been flowing consistently in a southeasterly direction with only minor seasonal variance.

4.0 REGIONAL GEOLOGY & HYDROGEOLOGY

The site resides at an elevation of approximately 760-feet above mean sea level (MSL) on the southern flank of Harrison Hill within the northwest portion of the Yakima Fold Belt Subprovince of the Columbia Plateau. The Yakima Fold Belt Subprovince consists of a series of Miocene age northeast-southwest trending low anticlinal ridges. Subsurface soils in the vicinity of the site consist of late Pliocene lacustrine (lake) deposits consisting of up to a 90-foot thickness of interbedded silt and fine-grain sands. The lacustrine deposits were lain down during catastrophic flooding related to the Lake Missoula floods approximately 12,000 years ago. Loessal deposits of wind blown glacial erosion sediments also have been deposited in the vicinity of the site.

The lacustrine deposits are overlain by the Snipes Mountain Conglomerate, which occurs as a series of linear channels representing the historic course of the Columbia River before diversion to its current location. The channels extend from the Sunnyside Gap southwesterly towards Goldendale. The Snipes Mountain Conglomerate ranges from 90 to 450-feet in thickness, overlying the Wanapum Basalt of the Columbia River Basalt Group (CRBG). The unconsolidated deposits overlying the CRBG reach thicknesses of up to 2,000-feet.

Many of these sedimentary deposits were created episodically in the Pleistocene age as vast glaciers originating in Canada advanced into the northern part of the Columbia Plateau, northern Idaho and Montana. Glacial meltwater streams from northern Washington, along with gigantic floods caused by sudden breakage of ice-damned lakes in the Selkirk and Rocky Mountains (Glacial Lake Missoula) cut deep channels (coulees) across the northern Colombia Plateau and deposited large volumes of sediments to the south. Sedimentary deposition occurred as slack water lakes when the water was partially impounded as it drained through the Columbia Gorge.

The CRBG are Miocene age (26 million years before present) flood-basalts deposited over a vast area of eastern Washington, Oregon and western Idaho and are of substantial cumulative thickness in the Sunnyside area. The basalts were generated from numerous fissures located across southeastern Washington and southern Idaho with individual flow thicknesses ranging

from a few tens of feet up to 300-feet. Sediments accumulated to various thicknesses during the periods between flows.

The overlying unconsolidated sediments and the CRBG host regional aquifer systems and are a major source of water to the Sunnyside area. The unconsolidated sediments are more important sources of groundwater than the basalt in areas where the sedimentary deposit is of substantial thickness. The basalt flows are a multilayered aquifer system with major aquifers located within the sand and gravel interbeds (which typically average 5 to 30 percent of the total flow thickness). General regional groundwater flow is southwesterly in the Wanapum Basalts. Some aquifers are connected hydraulically through vertical fractures or columnar jointing within the thinner basalt flows. These deep aquifers are the predominant water source for most municipal, industrial, domestic and agricultural needs. The overlying unconsolidated sediments are up to 400-feet in thickness in the Sunnyside area and provide water for private agricultural uses. Locally, shallow perched aquifers exist. In the vicinity of the subject site, the shallow aquifer beneath the site occurs at a depth of approximately 25 feet below grade. Historical groundwater management indicates the shallow groundwater beneath the site flows in a southwesterly direction.

5.0 ADDITIONAL WELL INSTALLATION & SOIL SAMPLING

Prior to advancement of exploratory borings for well installation at the subject site, the utilities were located using the one call utility locating service. No utilities were encountered during drilling activities.

5.1 Additional Well Installation

In order to perform the Feasibility Study, five additional borings with well completions were advanced at the site. The locations were selected based upon the ability to obtain the necessary information from the pilot tests and the potential future use in the soil and groundwater remedial system. The wells consisted of one 2-inch diameter PVC air sparge well and four 2-inch diameter PVC groundwater monitoring wells. All five borings completed for the well installations were drilled on April 13 and 14, 1999 by Boretec Drilling, Inc. of Spokane, Washington under subcontract to Maxim and were continuously observed and logged by an experienced geologist from our firm. Each boring was advanced using a trailer mounted Mobil B-24 drill rig. Four and ¼ and 3 ¼-inch inside diameter (I.D.) flighted auger casing was used during the drilling. Prior to the start of drilling activities of each boring, the drilling equipment and sampling tools were decontaminated by steam cleaning methods. During drilling operations, soil samples were collected at approximate 5 foot intervals with the exception of wells MW-13, MW-15 and SW-1 which were continuously sampled from the 15-foot depth to the total depth explored for each well. Also, at the clients discretion, well MW-16 was only sampled at the first two 5-foot intervals as sufficient data had already been collected in that portion of the site. All samples were placed in laboratory prepared jars and placed in chilled coolers for shipment to the laboratory for analysis. Each sample was screened in the field for the presence of volatile organic compounds utilizing a PID to facilitate the selection of soil samples for laboratory analysis. Drilling and sampling procedures are described in Appendix A.

Two of the wells, (SW-1 and MW-16) were installed on the Valley View Mart property and the other three wells (MW-13, MW-14 and MW-15) were installed on the Washington Hills Cellars property. On the Valley View Mart property, the air sparging well SW-1 was installed 15-feet southeast of existing well MW-3. The air sparging well was constructed with 2 ½-feet of 0.020-inch slot 2-inch diameter PVC screen and completed with 2-inch diameter PVC blank to the ground surface. The bottom of the sparge well was set at 26.0-feet below site grade. The groundwater monitoring well MW-16 was installed 12-feet southeast of sparge well SW-1 and set at a total depth of 20-feet below grade. Well MW-16 was constructed with 10-feet of 0.020-inch slot 2-inch diameter PVC screen and completed with 2-inch diameter PVC blank to the ground surface.

On the Washington Hills Cellars property, the three monitoring wells (MW-13, MW-14 and MW-15) were installed southeast from the existing well MW-9 with MW-13, 12-feet southeast, MW-14, 30-feet southeast and MW-15, 55-feet to the southeast. The wells were all constructed with 10-feet of 0.020-inch slot, 2-inch diameter PVC screen and 15-feet of 2-inch diameter PVC blank. The bottoms of the monitoring wells were set at 25-feet below the existing ground surface. Upon completion of well installation, each well was surged using a 1.5-inch diameter stainless steel bailer before being developed. A minimum of ten well volumes was removed from each well during development. A summary of the well installation development and sampling procedures and logs are presented in Appendix A. Well locations are shown on Figure 2, Site and Exploration Map.

5.1.1 Subsurface soil conditions

The soils encountered during the drilling program on the Valley View Mart property typically consisted of a loose to medium dense, moist to damp, brown, silty fine sand grading to a very stiff, saturated, brown, silt with some fine sand to the full depths explored. Medium to fine sand interbeds approximately 1 to 8-inches thick were encountered in various sampled intervals. The soils encountered below the Washington Hills Cellars property typically consisted of a medium to very stiff, moist, brown fine sandy silt with some medium to fine sand interbeds grading to a medium dense to dense, saturated, brown, silty medium to fine sand. The approximate locations of borings/monitoring wells are presented on Figure 2. Soil boring logs and groundwater monitoring well as-built diagrams are presented in Appendix A.

Soil samples were screened in the field for the presence of organic vapors using the field headspace measurement procedure described in Appendix A. Photoionization detector (PID) readings are presented on the boring logs in Appendix A and within Table 1. The field measurements of organic vapors using the PID and the head space procedures provide a general indication of the total organic vapor concentration but cannot identify specific organic compounds. Samples collected at or below the groundwater interface displayed elevated PID readings with the exception of those from well MW-15.

5.1.2 Groundwater Conditions

Groundwater was interpreted to be encountered at depths of approximately 16 to 17-feet below the ground surface on the Valley View Mart property and 15.5 to 16.0-feet below the Washington Hills Cellars property at the time of drilling. Prior to pilot testing on May 10, 1999, depth to water measurements were collected and ranged from 17.53 to 20.90-feet below top of

well casing in the new wells and 13.01 to 21.22-feet below the top of casings in the existing wells. Groundwater levels were measured on May 10, 1999 using an electronic water level probe, which can accurately measure groundwater levels to, 0.01-feet and were made relative to the top of the well casings. In addition, an interface probe capable of accurately measuring the top of the Light Non-Aqueous Phase Liquid Hydrocarbons (LNAPL) and the LNAPL/groundwater interface was used in wells suspected of containing LNAPL. Wells MW-6, MW-13 and MW-9 were measured to contain LNAPL with respective thicknesses of <0.01 to 1.96-feet. Based upon the water level measurements of May 10, 1999, groundwater elevations ranged from 728.49 to 747.27-feet. An approximate groundwater gradient of 0.0715-ft/ft (0.32-feet vertical fall in 100-feet horizontal) was calculated for the Valley View Mart property and a gradient of 0.00369-ft/ft was calculated for the Washington Hills Cellars property, with groundwater flow trending toward the south-southeast. Groundwater level measurements are presented in Table 2. A groundwater contour map for May 10, 1999 is presented as Figure 3.

Selected site groundwater monitoring wells were sampled immediately prior to and after both the in-situ air sparging and bioslurping tests. Approximately three well casing volumes of water were bailed from each monitoring well prior to sampling to obtain a representative sample. The actual volume of groundwater in each well casing was determined according to well dimensions (diameter and depth) and the height of the water column in the well. The wells were purged and sampled using a dedicated 1.5-inch diameter disposable polyethylene bailer. The samples were placed in laboratory prepared glass containers and stored in chilled coolers during shipment to the laboratory. Well purging and sampling procedures are described in detail in Appendix A.

The elevations of the newly installed wells (both ground surface and top of PVC casing) were surveyed on April 14, 1999. All elevations are referenced to previously surveyed elevations for wells MW-9 and MW-2.

5.2 QUANTITATIVE ANALYSES - SOIL

A total of seventeen soil samples were submitted to North Creek Analytical, Inc. of Bothell, Washington for chemical analyses. At least three samples were submitted from borings MW-13, MW-14, MW-15 and SW-1. All samples were submitted under Maxim chain-of-custody procedures and analyzed for the following:

- GRPH by Ecology Method WTPH-G,
- BTEX by EPA Method 8020,

No detectable concentrations of GRPH were found in any of the samples submitted for analysis from borings MW-14 and MW-15. Samples submitted from MW-13 contained detectable concentrations of GRPH ranging from 23.5 to 287 mg/kg with the exception of sample MW-13/S-2. The samples submitted from SW-1 contained detectable concentrations of GRPH ranging from 5.28 to 314 mg/kg, with the exception of the sample SW-1/S-7. MTCA Method A cleanup levels for soil of 100 mg/kg for GRPH were exceeded by samples MW-13/S-4, MW13/S-5 and SW-1/S-3 with the sample SW-1/S-3 displaying the highest concentration (314 mg/kg). Laboratory detection limit for GRPH was 5.0 mg/kg (ppm).

At least one of the BTEX compounds was detected in the samples submitted from borings MW-13 and SW-1. Only Benzene was detected above laboratory detection limits in three out of the six samples submitted from MW-14 and MW-15. None of the BTEX compounds were detected in any of the other three samples submitted from MW-14 and MW-15. MTCA Method A cleanup levels for Benzene in soil of 0.5 mg/kg which was exceeded in eight of the seventeen samples with sample MW-13/S-5 displaying the highest concentration (10.3 mg/kg). Respective MTCA Method A cleanup levels for Toluene and Ethylbenzene in soil of 40.0 and 20.0 mg/kg were not exceeded in any of the samples analyzed. The MTCA Method A cleanup level for Xylenes in soil of 20.0 mg/kg was exceeded in two of the seventeen submitted samples. Samples MW-13/S-5 and SW-1/S-3 displayed respective Xylenes concentrations of 29.9 and 31.0 mg/kg. Laboratory detection limits were 0.05 mg/kg for Benzene, Toluene, and Ethylbenzene, and 0.10 mg/kg for Xylenes.

Analytical test results for the soil samples submitted for analysis to North Creek Analytical, Inc. are presented in Table 3. Lab certificates for the soil samples are presented in Appendix B.

5.3 INVESTIGATION DERIVED WASTE

During drilling activities, a total of seven 55-gallon drums of soil cuttings were generated. All drums were stored on site in the southern area of the property, adjacent to the building. In addition, approximately 150 gallons of well development and decon water was generated and stored in properly labeled 55-gallon drums.

The purge water was sparged within the drums with a Rotron 101 regenerative blower. Upon completion of sparging activities, a sample was collected to verify that hydrocarbons had been volatilized. The purge water sample, labeled Purge Water-Decon, analytical results did not indicate detectable concentrations of GRPH, toluene, ethylbenzene or xylenes. A detectable concentration of benzene was observed, but did not exceed the MTCA Method A cleanup level for groundwater of 5.0 µg/L. The water was discharged on site for irrigation.

The seven drums of soil boring cuttings were transported off site on July 7, 1999 by Remtech and transported to their facility located in Spokane, Washington. A Maxim environmental technician was on site to oversee the removal of the soil drums from the site. Upon reaching the Remtech facility, the soil was treated using thermal desorption, removing the petroleum hydrocarbons impacts from the soil. The treated soil was disposed of by Remtech.

6.0 LIMITED REMEDIAL INVESTIGATION/FEASIBILITY STUDY

During the week of May 10, 1999, a series of remedial tests were performed at the subject site and across First Street at the Washington Hills Cellars property. Vapor extraction testing of an existing vapor extraction system and in-situ air sparge testing was performed at the site. Bioslurp testing was performed on the Washington Hills Cellars property. The tests were performed to determine the most feasible and effective method to remediate petroleum hydrocarbon impacts to the soil and groundwater below both properties.

6.1 Vapor Extraction Test Analysis

Four 1-hour vapor extraction tests were conducted at the subject site utilizing the existing manifolded monitoring wells MW-3, MW-4 and MW-5 as extraction points. An existing Rotron Model DR707 Regenerative blower was connected to the extraction point while site monitoring wells were monitored with Magnehelic gauges in order to determine induced subsurface vacuum and radius of influence in the unsaturated soils. During each test, off-gas measurements of: 1) relative concentrations of volatile organic vapors were collected with a PID; 2) CO, CO_2, and O_2 were collected with a RKI Industries, Inc. Model Eagle gas detector; and 3) airflow was monitored using a Dwyer Model 471 thermal anemometer. Vapor extraction tests were conducted on the wells MW-3, MW-4 and MW-5 individually and on the combination of the three wells together. Appendix C presents the off-gas, airflow and applied and induced vacuum measurements recorded during the vapor extraction tests completed at the site. Samples of the off-gas were collected for analysis at the beginning and end of the combined test. Samples were submitted to the Performance Analytical Laboratory in Simi Valley, California for analysis of speciated hydrocarbons by EPA Method TO-14 and total non-methane hydrocarbons (TNMHC) by EPA Method TO-12. Results of the off-gas sample analytical testing are presented in Table 6. Laboratory certificates for analytical testing of off-gas samples are also presented in Appendix D.

A vacuum of 60-inches of water (IOW) was applied to each of the three wells during the individual tests and 70-IOW during the combined testing. Typically, the distance affected by one percent of the total vacuum is interpreted to be the effective radius of vacuum influence for accomplishing removal of volatiles from the subsurface. This would mean that a well within the effective radius of influence should have exhibited an applied vacuum of 0.6 to 0.7-IOW. No wells were within the effective radii of influence during the tests performed on wells MW-3 and MW-5. The effective radius of influence for MW-3 and MW-5 is assumed to be less than 20-feet, the distance to the closest well. The tests performed on MW-4 and the three wells combined indicate that vapor points VP-1 and VP-2 were within the estimated 15-foot effective radius of influence of MW-4. Airflow rates, as measured at the manifold, ranged from 24 to 54-cubic feet per minute (cfm). Off-gas laboratory analytical and field PID measurements indicate that moderate concentrations of volatile petroleum hydrocarbons were being removed from the unsaturated soils. The concentrations may be attributed to the volatilization of the free phase hydrocarbons floating on the water column in the immediate vicinity of the extraction wells.

6.1.1 Summary of Vapor Extraction Testing

Vapor extraction is a proven technology to aid in the remediation of petroleum hydrocarbon impacted soils. However, this technology is most effective in porous soils through which the soil gases migrate more easily. The vapor extraction testing performed at the site indicates that the vadose zone soils are low permeability deposits, with the highest rate of extracted airflow confined to the thin sand layers encountered during the drilling program. The low permeability of the native site soils limits the airflow thus reducing the effective radius of influence for the applied vacuum. Testing indicates that a significantly larger vacuum source is necessary to increase the effective radius to a more feasible distance.

6.2 Air Sparge Test Analysis

In-situ air sparging, tests are conducted to evaluate the achievable increased dissolved oxygen radius of influence in groundwater around an air injection point. An additional benefit of air injection is the passage of the injection air through soil channels and the subsequent volatilizing of aromatic hydrocarbons where they can be recovered with soil vapor extraction wells. The increased oxygen and gas phase flow within the radius of influence can also lead to increased biodegradation by naturally occurring petroleum hydrocarbon degrading aerobic microorganisms both in the saturated and unsaturated zones.

A 4 ½-hour in-situ groundwater air sparging pilot test was performed at the subject site on May 14, 1999 to assess the feasibility of installing an in-situ air sparging system at the subject site. An air sparging well (SW-1) was installed during the subsurface exploration program on April 13 and 14, 1999. The well was specifically designed to conduct the sparging pilot test at the subject site. The 2-inch PVC sparge well was installed with 2 ½-feet of 0.020-inch slot screen placed approximately 7 ½-feet below the top of the groundwater table at the time of installation. The screen extends to a total depth of 26-feet was set to be within an approximately 8 to 10-inch thick sand layer encountered at approximately 24.2 to 25-feet below grade. Groundwater at the subject site is approximately 16-feet below grade.

6.2.1 Sparge Test Procedures

The test was conducted on the sparge well SW-1 utilizing the following configuration: A Sullair 185Q air compressor was utilized to inject an air stream through a sparging regulator before introduction into the sparging well. The sparging regulator consisted of a flow meter, pressure regulator and an oil/water filter to remove any errant hydrocarbons or moisture, which may be produced by the compressor. A vacuum was also applied to wells MW-3, MW-4 and MW-5 utilizing the existing vapor extraction system at the site. A vacuum was induced utilizing a Rotron DR 707 regenerative blower with a maximum flow rate of 280 cfm.

Throughout the duration of the test, wells MW-1, MW-2, MW-3, MW-4, MW-6, MW-7 and MW-16 were monitored for dissolved oxygen (D.O.), temperature, conductivity, pH and depth to water and/or product. A YSI Model 55 dissolved oxygen meter was used to determine D.O. concentrations and groundwater temperature in the monitoring wells during the air sparging pilot test. The dissolved oxygen and temperature measurements were collected by lowering the D.O. probe into the well and obtaining direct in-place measurements. Measurements were collected approximately 1 to 2-feet below the water interface inside the well casing. An Orion Model 115 conductivity meter and an Orion Model SA 230 pH meter were used to measure respective groundwater conductivity and pH upon completion of the individual well D.O. measurements. The measurements were taken by carefully dipping a dedicated disposable bailer into the well to withdraw approximately 8-ounces of groundwater for placement into a laboratory prepared 8-ounce dedicated glass sample jar. Groundwater measurements were obtained utilizing a Solinst water level indicator, capable of measuring depth to water below the top of well casing to the nearest 0.01-foot. Measurements were typically measured approximately every 30-minutes in wells MW-1, MW-2, MW-3 and MW-7 and were collected until the termination of the test. Wells MW-4, MW-5 and MW-6, known to have contained LPH, were not monitored for parameters except for depth to water and depth to product. Fluid level measurements were

collected utilizing a Solinst interface probe, which is capable of detecting both water and liquid phase hydrocarbons and measuring depths to the nearest 0.01-foot.

During the pilot test, off-gas from the vapor extraction system was monitored to determine volatile aromatic hydrocarbon concentrations in the off-gas. The vapor extraction system was connected to wells MW-3, MW-4 and MW-5. Measurements were typically collected every 60 minutes with a PID. A vapor sample was also collected at the initiation and termination of the sparging pilot test for laboratory analysis. Vapor samples were collected in Summa® canisters and sent to Performance Analytical, Inc. in Simi Valley, California.

Groundwater samples were collected from wells MW-2, MW-3, MW-16 and SW-1 immediately prior to and after the air sparging test. The wells were first purged of three well volumes using a disposable polyethylene bailer and dedicated bailer cord prior to collection of the samples. The samples were collected using the dedicated bailer and were placed in one laboratory prepared 500-ml poly bottle and two 40-ml VOA's for each well. The samples were immediately placed in a chilled cooler for shipment to North Creek Analytical in Bothell, Washington under Maxim chain of custody procedures. The samples were analyzed for TPH-G, BTEX and the dissolved metals Arsenic, Calcium, Chromium, Iron, Lead, Manganese, Magnesium and Zinc. The analytical results for the collected samples are presented in Table 5. The laboratory analytical certificates are presented in Appendix F.

Prior to conducting the sparge test, an estimated break through pressure of 5.0 psi was calculated based on the measured water column above the screened interval of the sparge well. This pressure was determined to be the required breakthrough point at which air should be effectively transferred through the well screen into the saturated zone. The test was initiated at 1600 and completed by 2030 on May 14, 1999. At the start of the test, the injected air pressure was rapidly increased as no airflow was observed through the gauge. At 5-minutes into the test the air pressure was increased to 10-psi and by 10-minutes into the test it had been increased to 15-psi. The pressure of 15-psi was maintained throughout the remainder of the test. Airflow through the gauge was not observed until after 60-minutes into the test when a flow of approximately 1 cubic foot per minute (cfm) was recorded. The airflow remained at this rate until reaching 230-minutes into the test when an increase to 1.5-cfm was observed. The flow increased once more at 250-minutes into the test to between 1.5 to 2-cfm and remained at that level until the end of the test.

6.2.2 Interpretation of Sparge Test Data

Two rounds of background measurements of fluid levels, D.O., temperature, pH and conductivity were taken from the wells prior to the initiation of the air sparge test. These background measurements were compared to the readings taken during the test and used as a base to help determine test influenced fluctuations. In addition, the laboratory analytical results from the four groundwater well samples collected after the test were compared to those collected just prior to the start of air injection. No statistically significant changes were observed upon review of the pH, conductivity and temperature measurements and in the TPH-G, BTEX and dissolved metals analytical results. Dissolved oxygen concentrations were also observed to exhibit no statistically significant changes with the exception of MW-16, which displayed a rise from 1.96 to 5.69 mg/L before reducing to 3.98 mg/L, by the end of the test. Although

influenced by the air injection, the D.O. concentration did not achieve the calculated saturation level of 9.31 mg/L possible for water at the measured temperature and site elevation.

The only parameter to display a reaction from the air injection in more than one well were the water level measurements. A general rise in water levels was observed in all monitored wells and ranged from 0.03 to 2.96-feet. The largest increase was observed in MW-16 as water level fluctuated from the static level of 17.78-feet to the highest point of 14.82-feet at 160-minutes into the test. Large increases in the groundwater level tends to have a negative impact on the effectiveness of air sparging by submerging soil potentially available for remediation utilizing vapor extraction.

The vapor extraction system was operated throughout the duration of the air sparge test and the stack off-gas vapors sampled for laboratory analysis. The sampling was performed to provide quantitative data concerning the potential increase in soil vapor volatile organic concentrations as a result of the air injection. In comparing the analytical data obtained from the vapor extraction test samples to that obtained from the air sparge test samples, no statistically significant change in volatile organic concentrations was observed. Both sets of samples were collected with identical vapor extraction system blower and manifold configuration.

Initial plans for the air sparging test were for the test duration to be a minimum of 12-hours. At 4-hours into the test, after observing the lack of reactions from the injected air, including the low air flow rate at a significantly high air pressure, the decision was made to terminate the test early. The water and air analytical results additionally indicate that air sparging is not an effective method for remediation of petroleum hydrocarbons within the subsurface soil and groundwater beneath the site.

6.3 Bioslurping Test Analysis

The bioslurping test was performed on the Washington Hills Cellars property on May 11 through 13, 1999. Three new monitoring wells (MW-13, MW-14, and MW-15) were installed on April 13, 1999 to improve the collected data by providing monitoring points at distances of 13, 30 and 55-feet from well MW-9 (extraction well). The testing was conducted to determine the effectiveness of this technology on the low permeability, dense, fine grained soils known to exist below both the subject site and the Washington Hills Cellars properties. This remedial technology is best suited for sites, which contain LNAPL's in low-permeability soils.

6.3.1 Field Procedures

The test was conducted on the 4-inch diameter monitoring well MW-9 located on the Washington Hills Cellars Property. MW-9 was selected due to its casing diameter and past history of containing the greatest thickness of LNAPL's. An Atlantic Fluidics Model A-130 liquid ring pump was utilized to apply the vacuum to the stinger, which was lowered into the well. The stinger consisted of 2-inch diameter, schedule 80 PVC piping approximately 30-feet in length with the bottom end cut to an approximate 45-degree angle. The top of the well was sealed using a well head constructed to include a 3-inch gate valve off the side to allow for controlled fresh air introduction and a 2 x 4-inch well seal on the top, through which the stinger was lowered. The stinger allowed for application of vacuum directly to a chosen level inside the well casing and was lowered to predetermined levels during the three phases of the test. The

withdrawn soil vapors were piped directly into a 1,000-pound air scrubber carbon unit. The withdrawn product and groundwater were piped into a 21,000-gallon, closed top tank equipped with air sparging piping. When sufficient liquid had collected in the tank, a Rotron EN-707 blower was connected to the air sparge piping and the liquid sparged for a minimum of 24-hours. Before sparging, the liquid inside the tank was checked for the presence of LNAPL's using an interface probe. No LNAPL's were measured. The lack of LNAPLs in the tank may be due to a volatilization of the LNAPL during extraction and transfer to the tank. The vapors generated inside the tank from the air sparging were withdrawn utilizing a Rotron EN-404 and were piped into the air scrub carbon unit. The off-gas from the air scrub carbon unit was periodically measured for breakthrough while being vented through a 30-foot high 3-inch diameter stack. Upon completion of the air sparging within the tank, the liquid was run through a 55-gallon liquid carbon scrub unit before being discharged to the Port of Sunnyside water collection system. A general schematic of the Bioslurp pilot test layout is presented in Figure 4.

The first phase of testing consisted of a short term product skimming which was conducted for only one hour. Initial estimates of approximately 8 to 16-hours were unnecessary due to the rapid drop in observed LNAPL recovery rates. This initial phase of the test involved setting the stinger at the LNAPL/groundwater interface of 22.6-feet below the top of the well casing with the wellhead gate valve open to the atmosphere. The test simulated actual LNAPL recovery rates by limiting influences of the applied vacuum outside the well casing.

The second phase of testing was initiated immediately upon completion of the first phase and consisted of closing the gate valve. The stinger height was left unchanged at the top of the groundwater interface and was continued for 27 ½-hours. This phase involved the application of a vacuum on the extraction well of initially 15-inches of Mercury (IOHg) which dropped to 9 ½-IOHg by the end of this phase. The drop in applied vacuum likely resulted from the development of air pathways within the formation and not as a result of equipment adjustments. The application of the vacuum at this phase will allow for the reduction of the capillary fringe pressure in the LNAPL zone at a point where fluid pore pressures have been reduced from the skimming activities.

The third and final phase of testing was initiated immediately upon completion of the second phase and was run for 24-hours. This phase consisted of the dual phase/drawdown simulation portion of the test. This phase involved lowering the stinger 6.2-feet further into the well, below the static groundwater level measured during the baseline measurements. The stinger was placed at the deepest point feasible considering the formation and well construction. Had the applied vacuum been less than 5.4 IOHg, the stinger would have been lowered to a depth equal to the wellhead vacuum observed during phase two of the bioslurping test. But as the applied vacuum was observed to be 9.5 IOHg at the termination of phase two, the stinger placement was determined considering the total depth of the extraction well and the available length of the stinger. Phase three was conducted to induce a small cone of depression around MW-9 to determine if using both lateral vacuum pressures and gravitational forces could increase the mobility of the LNAPL into the well.

6.3.2 Field Data Collection

Throughout the duration of all three phases of the bioslurping test, measurements were collected from both site monitoring wells and the system. In addition, groundwater samples were collected from selected wells and air samples were collected from the off-gas of the liquid ring pump before entering the carbon unit. The bioslurping system data consisted of periodically measuring and/or recording the following:

- The total system applied vacuum as indicated on the vacuum gauge in IOHg;
- Recovery rate of fluids by timing the duration between activation of the knockout tank discharge pump and recording the indicated total gallons discharged on the totalizer flow meter;
- The effluent air was measured for relative organic vapor concentrations utilizing a PID, CO, CO2, O2 and LEL using the Eagle four gas meter and air flow utilizing a Dwyer digital anemometer; and
- The off-gas stack was measured for organic vapor concentrations using a PID to determine if breakthrough was potentially occurring.

Monitoring wells MW-5, MW-6, MW-7, MW-8, MW-10, MW-11, MW-13, MW-14 and MW-15 were periodically measured during each phase of the test and during recharge of the aquifer for the following parameters:

- LNAPL and/or groundwater levels using either dedicated water level indicators or an interface probe; and
- The applied vacuum on the well as measured at the wellhead using a set of Dwyer magnahelic gauges.

Tables containing the system and groundwater monitoring data for the bioslurping pilot test are enclosed in Appendix G.

The air samples were collected using Summa® canisters approximately 10-minutes after initiation of and prior to completion of each phase of the testing. The samples were submitted to Performance Analytical of Simi Valley, California for analysis of the following:

- TNMHC and hydrocarbon speciation by EPA test methods TO-12 and TO-14.

The analytical data is presented in Table 6 and the laboratory analytical certificates are presented in Appendix D.

Immediately prior to and at the completion of the entire bioslurping test program, groundwater samples were collected from seven wells, MW-8, MW-9, MW-10, MW-13, MW-14 and MW-15 and the Washington Hills Cellars production well, all on the Washington Hills Cellars property. The samples were submitted to North Creek Analytical of Bothell, Washington and analyzed for the following:

- GRPH by Ecology Method WTPH-G,
- BTEX by EPA Method 8020,

The analytical data is presented in Table 5 and the laboratory analytical certificates are presented in Appendix F.

6.3.3 Model Construction

Introduction

To remediate the contaminated soil and groundwater at the site, a remedial alternative and design is needed. The presence of LNAPL (light nonaqueous phase liquid) as well as dissolved constituents in groundwater and the desired use of air extraction constitutes a multiphase flow and transport problem. The placement of multiphase extraction wells and associated extraction rates is not amenable to solution by analytical means. A numerical model and the use of a computer to solve the equations for multiphase flow and transport are needed. The computer model selected for application at this site is BIOSLURP (Draper Aden Environmental Modeling, Inc.).

The numerical model BIOSLURP is a finite element multiphase areal organic vacuum enhanced recovery and multi-component transport simulator. The model has the capacity to simulate the flow and transport of LNAPLs with or without vacuum enhanced recovery in unconfined heterogeneous anisotropic aquifers. BIOSLURP also simulates multi-species dissolved phase and gas phase transport in heterogeneous anisotropic media.

Capabilities

The BIOSLURP flow module invokes an assumption of near-equilibrium conditions in the vertical direction. This reduces a three dimensional problem to a two dimensional one, reducing the computing requirements for the model. BIOSLURP uses three phase constitutive relations to update phase saturations (water, oil, and gas) with depth, and updates transmissivities continuously during the simulations.

The BIOSLURP transport module considers dispersion, diffusion, adsorption, desorption, and biodegradation based on oxygen limited, first order, or Monod-type biodegradation kinetics as well as sequential first order biodegradation involving multiple daughter products. The flow module continuously updates the distribution of NAPL specific volume in the domain to define temporal and spatial variation in the source for the transport module. The transport module simulates the aqueous phase and the gas phase transport, and computes and updates the temporal and spatial variation in the interphase mass transfer terms (source/sink) for the flow equations at each time step during the simulation.

BIOSLURP will be used for this project to design the placement of extraction wells at the project site, and to establish initial operating conditions. The goal of the modeling exercise is to place and operate a bioslurping remedial system that will yield the greatest recovery of petroleum hydrocarbons from the dissolved, vapor and LNAPL phases. To accomplish this, a numerical model will be constructed in the form of data sets as input to BIOSLURP. The model will be executed, and the results will be compared to known conditions and model goals. If adjustments

to the input data sets need to be made to more closely match observed conditions, the model will be run again. The final model run will provide the locations and system vacuum levels to achieve modeling goals.

Limitations

The limitations of BIOSLURP as a flow and transport model are primarily those of computer capabilities and data set completeness. In order to reach a solution for a given set of inputs, BIOSLURP iteratively solves a large set of simultaneous equations. The number of these equations relates directly to the number of individual nodes in the model. This set of equations must be defined and stored in arrays in order to be solved by the computer program. The storage of the arrays uses computer memory, and the solution of the model input requires processor power. A relatively coarse node spacing reduces storage and processor demands, but sacrifices resolution when interpreting results. A finer grid will increase the resolution of the model results, but will place greater demands on storage and processor resources, to the point of impracticability. A balance between computer power and storage and the desired results of the model simulation is required for satisfactory results in a reasonable amount of time. For this site, a model grid spacing was selected so that remedial design conditions could be met and the numerical representation of the conceptual model could be solved on a personal computer.

BIOSLURP does not have the capability to represent initial conditions in the modeled area that represent the distribution of chemicals in the unsaturated zone of soil or air, or the concentration of chemicals in groundwater. An initial problem had to be defined at the time of release to the environment of contaminants so that flow and transport processes defined in other model inputs displace and degrade the LNAPL and other phases. Additionally, input data that were not available regarding the chemical properties of the contaminants of concern, or properties of the soil matrix or flow conditions at the site, conservative assumptions were made to complete the data set. The model output is thereby limited by the degree to which the assumptions represent actual site conditions.

After selection of the model, a conceptual model was developed to aid in the transformation of the continuous real site to a spatially and temporally discretized model. The site conceptual model consists of the physical boundaries of the site area and the hydrogeologic and chemical conditions at the site. The subsurface matrix is homogeneous, with a relatively uniform groundwater flow gradient established from monitoring well measurements. The estimated extent of contaminated soil and groundwater, as well as the known indications of free product are shown in Figure 5. This conceptual model was used to derive the parameters and properties entered in the computer model.

6.3.3.1 Physical Representation

The physical extents include the area affected by petroleum hydrocarbons and potential remedial solution locations, so that a representative model could be developed. The modeled area covers approximately 212,000 square feet, and its extents are shown in Figure 6. The model node spacing is 26 columns of nodes and 21 rows of nodes. The modeled area is represented by these nodes in a rectangular array of 546 elements. The modeled area is oriented so that the long axis of the finite element array is parallel to groundwater flow. This facilitates the definition of

boundary conditions at the upgradient and downgradient edges of the modeled area. The model nodes are shown on the clear overlay of Figure 6.

Input units are required to be consistent throughout the data input process in order for the model to accurately compute results. The units selected for this model are feet (length), days (time), grams (mass), and cubic feet (volume).

6.3.3.2 Hydrogeologic Representation

Hydraulic Conductivity

Drive point, soil boring, and monitoring well installation data have provided information about the properties of the subsurface and the shallow unconfined aquifer beneath the modeled area. Soil materials consist of tight silts and silty loam with occasional sand stringers. Hydraulic conductivity of this soil material was established by aquifer baildown tests (Wohlers, June 1997). The average hydraulic conductivity was calculated to be 0.83 ft/day. An approximate value of 1 ft/day was used as input to this model.

Boundary Conditions

Groundwater elevations at the site range from approximately 748 feet above mean sea level to 724 feet above mean sea level. The hydraulic gradient at the site trends to the south-southeast at a value of 0.04 ft/ft. The gradient is relatively uniform throughout the site, with a slight steepening to the north. Water table depths from ground surface have ranged from approximately 11 feet (MW-1) to 20 feet (MW-11). Model input data was entered so that the area hydraulic gradient was duplicated in the model. This was accomplished by fixing the hydraulic head at the upgradient and downgradient boundaries of the modeled area at known values.

Porosity

The porosity of the soil matrix in the modeled area was assumed from literature values for similar materials, and was specified at 0.39 (Freeze and Cherry, 1979).

Wells

Recovery wells are to be placed in the modeled area to remove air, water, and LNAPL. The effect of a pumping well is used to calibrate the model using test data. The computer model represents extraction wells by imposing sources or sinks of head, pressure, or concentrations of solutes at an established point. The placement and extraction rates of the recovery wells are varied to establish the operation of the bioslurping system for effective site remediation.

6.3.3.3 Geochemical Representation

Chemical Species

Gasoline released from the site affects soil and groundwater. The constituents of concern included in this model are benzene and total petroleum hydrocarbons, expressed as gasoline (TPH-G). Data were not available to establish the ratio of these species as they exist in the aquifer today due to volatilization and biodegradation. A typical distribution for gasoline of 5% benzene, 95% TPH-G was used (DAEM, 1998).

Chemical Distribution

The distribution of transport constituents in BIOSLURP is limited to specification of LNAPL at observed points, specified by X and Y coordinates. The thickness of the LNAPL at the observation point is specified by input of interface elevations between air, oil, and water. A built-in algorithm uses porosity, air pressure, and soil material properties data to calculate the thickness of LNAPL in the formation.

6.3.4 Model Calibration

Flow Calibration

The model was initially run with no LNAPL present to simulate prerelease conditions and calibrate the groundwater flow portion of the model. April 1999 water table elevation contours (Figure 7) were selected as calibration targets. Specified head boundaries were adjusted in an attempt to generally match April 1999 conditions. A comparison of Figure 8 to Figure 7 shows that simulated water table contours generally match April 1999 water table contours.

Transport Calibration

A pilot test was performed at the site in monitoring well MW-9 on May 11 and 12 to establish a point of comparison for model results. During the pilot test, a portable bioslurping system was set up and a vacuum extraction pipe was lowered to the oil-water interface. The following operating parameters were used in calibration efforts.

A vacuum of 15 IOHg (17 feet of water) was applied to the extraction pipe.

After 1 hour, the well bore was sealed, and vacuum was applied to the subsurface unsaturated zone.

After 27 1/2 hours, the tip of the extraction pipe was lowered 6.2 feet into the groundwater, and the test continued for another 24 hours.

Measurements of water levels and vacuum readings were taken at regular intervals in observation wells.

Limitations to the data set and capabilities of the model resulted in an interpretive site-specific model rather than a rigorously calibrated model. Limitations, generalizations, and assumptions of the model and model calibration results are summarized below.

BIOSLURP does not have the capability to specify the distribution of mass of residual petroleum in soil for the modeled area. The result of this limitation for this site is that the simulated concentration of hydrocarbons in extracted air cannot be simulated accurately to current conditions. Conversations with the model developer indicate that for residual petroleum in soils to be adequately modeled, a simulation from the time of release is required, and calibration to current conditions from that point. Flow and transport conditions are known or assumed at this site, but the time of release and the total mass initially released are not known, making this type of calibration imprecise and impractical.

BIOSLURP does have the capability to specify initial contaminant concentrations in groundwater. However, at a mature site such as this one, greater than one half of the mass of separate phase hydrocarbons present exist in the residual phase, and then partition to groundwater based on solubility data specified. Current contaminant concentrations in the groundwater are known, but without being able to specify source terms for the groundwater, calibration of the model to this parameter is not possible.

Based on material types observed, the calculated ratio of well bore thickness of LNAPL to true formation thickness is high, on the order of 100:1. Conversations with the model developer indicated that the formational thickness of the LNAPL computed by the model based on these input data would produce no LNAPL recovery from bioslurping wells after a few days. The pilot bioslurping test run at the site produced less than 17 gallons of emulsified water and LNAPL during the product recovery phase of the test. The volume of LNAPL recovered is unknown. Model results show that no LNAPL is recovered from wells after the first day, so data are insufficient to establish calibration criteria for LNAPL recovery.

Calibration of the model to air pressure distribution observed during the pilot test is not possible with reasonable and representative values for soil permeability. Calibration to air pressure distribution during the pilot test involves the extraction rate from the well and soil permeability specified in the model. The pilot test established a vacuum of 15 IOHg (17-feet of water) at the recovery well, and observed a corresponding imposed vacuum of 0.2 feet of water was observed at the nearest observation well 13 feet away. Based on the material types observed at the site and representative soil permeability for these types, it is likely that the vacuum in the well was short-circuiting to the ground surface at some point close to the well, reducing the effect of the vacuum in nearby wells. Model results for test conditions and a range of soil permeabilities at the site resulted in a greater distribution of vacuum conditions than those observed during the test.

Drawdown of water in wells observed during the pilot test can not be meaningfully calibrated. Calibration to observation wells drawdown requires data on the distribution of vacuum imposed on the system between air and water phases. Due to the high vacuum conditions of the pilot test, zones of low pressure in air close to the well may have actually drawn the water table up into the unsaturated zone above the pretest elevation. The actual drawdown of water in the aquifer is based on a different set of site conditions due to the questionable accuracy of vacuum data.

The model could be calibrated neither to LNAPL, vapor, or aqueous phase recovery data, nor to air or water pressure distribution data due to data and/or model limitations.

6.3.5 Model Results and Remedial Design

The model was used to simulate bioslurping wells in several locations to impose a combination of stresses on the subsurface system to optimize capture of petroleum hydrocarbons in air, water and LNAPL phases. A set of eight wells were placed at the site in areas near the source of the LNAPL and the current observed position of the LNAPL across the street to the southeast. The position of the wells is shown on Figure 9. The selected well configuration was based on the physical limitations of the site, and potential use of existing wells as bioslurping wells. The bioslurping wells are placed at model nodes, corresponding closely to actual locations of monitoring wells at the site. The physical offset of the model results with the monitoring well locations is not considered significant because of the magnitude of the offset (less than 5 feet) and the relatively homogeneous nature of the aquifer material.

Simulation of bioslurping included these input parameters:

The inlet tip (stinger) was placed five feet below the air-water interface elevation of groundwater.

Each bioslurping well operates with an imposed air vacuum of 3.5-IOHg (4 feet of water) at the well head, and a groundwater recovery rate of 1.3 gallons per minute.

The predicted distribution of air pressure and the deformation of the potentiometric surface is shown on Figure 9. Figure 9 shows that approximately 1 foot of vacuum can be maintained in an area that encompasses the expected area of LNAPL and potential residual petroleum impacts. Figure 10 shows the predicted drawdown of groundwater at the site using the 8 bioslurping wells in the configuration and operating conditions described above. The figure shows that groundwater drawdown exceeding one foot surrounds the five downgradient wells, and in proximity to each of the three upgradient wells. Comparison of Figure 10 and the predicted groundwater flow directions in Figure 9 indicates capture of flowing contaminated groundwater is likely by either the upgradient or the downgradient wells. In addition, the estimated time for the capture zone to reach equilibrium is 30-days.

The concentration of constituents of concern in groundwater and time required for the bioslurping system to meet regulatory requirements were not predicted. The uncertainty of the mass of residual gasoline remaining beneath the site and the fact that the model does not include the current mass of residual would cause the model to underestimate groundwater concentrations and cleanup times. It would not be possible using this model to estimate the degree of underestimation.

6.4 Disposal of Pilot Test Groundwater

During the bioslurping pilot test, extracted groundwater and product was transferred into a 21,000-gallon holding tank which was configured with a closed-top and air sparging piping. When sufficient liquid (which was extracted from MW-9) had collected in the tank, a Rotron

EN-707 blower was started to treat the collected liquid. Vapors were collected from the tank and treated as described in section 6.3.1 of this report. The collected fluid was sparged for approximately 4 days (May 12 through 15). After sparging of the water was completed, arrangements were made with the Port of Sunnyside for disposal of the water into the Port of Sunnyside storm drain located on the Washington Hills Cellars property (Figure 4). A copy of the permit is attached in Appendix H.

Prior to discharge of the treated groundwater, a sample was collected from the tank. The sample was submitted to North Creek Analytical of Spokane, Washington for analytical testing of purgeable hydrocarbons (gasoline) by Ecology Method WTPH-G, BTEX by EPA Method 8020, and total lead by EPA Method 6010/7000. No detectable concentrations above the laboratory method detection limits were found in the discharge sample. Analytical test certificates are attached in Appendix H.

On May 20, 1999, a representative from Maxim met with Mr. Robert Farrell of the Port of Sunnyside to discharge the treated groundwater into the catch basin located on the Washington Hills Cellars property. The treated effluent was passed through a 55-gallon activated carbon liquid scrub unit (Figure 4) before discharging to the catch basin. Mr. Farrell of the Port of Sunnyside approved the discharge of the fluid. A copy of the memo is attached in Appendix H. Approximately 3,809 gallons of treated effluent were discharged to the Port of Sunnyside system.

7.0 CONCLUSIONS

Previous investigations performed at the site by other consultants have identified petroleum hydrocarbon impacts to both the soil and groundwater, which extend from the Valley View Mart property, across First Avenue onto the Washington Hills Cellars property. The petroleum hydrocarbon plume is interpreted to be approximately 210 by 70-feet in maximum extent. Twelve wells had been installed by previous Time Oil Co. consultants prior to initiation of the RI/FS activities.

Five additional borings completed with 2-inch diameter wells (one air sparging and four groundwater monitoring) were installed at the site as part of the RI/FS. The well locations were selected to provide data within areas not covered by the existing groundwater monitoring wells. The native soils encountered on the Valley View Mart property typically consisted of a loose to medium dense, moist to damp, brown, silty fine sand grading to a very stiff, saturated, brown, silt with some fine sand. Medium to fine sand interbeds approximately 1 to 8-inches thick were encountered in various sampled intervals. The soils typically encountered below the Washington Hills Cellars property consisted of a medium to very stiff, moist, brown, fine sandy silt with some medium to fine sand interbeds grading to a medium dense to dense, saturated, brown, silty medium to fine sand.

Selected soil samples from the borings indicated the presence of elevated levels of Gasoline Range Petroleum Hydrocarbons (GRPH) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) in the subsurface soils on both the Valley View Mart and The Washington Hills Cellars properties. GRPH impacts to soil were limited to samples submitted from borings MW-13 and

SW-1. At least one of the BTEX compounds was detected in at least one of the samples submitted from each of the borings. MTCA Method A cleanup levels for soil were exceeded for GRPH in samples submitted from borings SW-1 and MW-13. MTCA Method A cleanup levels for soil were exceeded for at least one of the samples submitted for benzene from borings MW-13, MW-14 and SW-1 and for xylenes in borings MW-13 and SW-1.

Water level measurements collected on May 10, 1999 from all sixteen of the groundwater monitoring wells exhibited groundwater at depths of 17.53 to 20.90-feet below the top of the well casing in the new wells and ranged from 13.01 to 21.22-feet below the top of casings in the existing wells. Groundwater elevations ranged from 728.49 to 747.27-feet in all wells. LNAPL was detected in wells MW-6, MW-9 and MW-13 with thicknesses ranging from <0.01 to 1.96-feet. A groundwater gradient of 0.0715 ft/ft was calculated for the Valley View Mart property and 0.0410 for the Washington Hills Cellars property with a flow trending to the south-southeast

The 4-hour in-situ air sparging test conducted on well SW-1 did not result in significant changes in any of the monitored parameters with the exception of groundwater levels. The field parameters of temperature, D.O., conductivity, pH, and applied vacuum or pressure at the well head in addition to relative off-gas concentrations at the VES stack were all monitored during the test. Samples were taken of the VES off-gas and groundwater from selected monitoring wells and submitted for quantitative vapor and groundwater hydrocarbon and groundwater dissolved metals concentrations. Analysis of the data indicated that in-situ air sparging would not be an effective remedial technology for the site.

Four 1-hour vapor extraction tests were performed on wells MW-3, MW-4, MW-5 and the three wells combined. The existing manifold and blower configuration was utilized for the test. The test results indicate that a 15 to 20-foot effective radius of influence could be achieved at an applied vacuum of 60 to 70-inches of water (IOW). Analytical results from air samples collected during the test indicated that only moderate concentrations of petroleum hydrocarbon vapors were being removed and may be attributed to volatilization of the free product within the wells. The low permeability of the native soils tends to limit airflow with preferential flow exhibited in the observed thin sand layers. The testing tends to indicate that a significantly larger vacuum source is necessary to effectively use this remedial technology

The 52 ½-hour bioslurping test performed using the existing well MW-9 as the extraction point was divided into three phases as follows: phase one was run for the period of 1-hour for product recovery with the stinger at the groundwater interface and the well head open to the atmosphere; phase two was run for the period of 27 ½-hours with the stinger at the groundwater interface and the wellhead closed to the atmosphere; and phase three was run for a period of 24-hours with the stinger lowered 6.2-feet into the well and the wellhead closed to the atmosphere. Data interpretation using the BIOSLURP Model indicated that this technology is a feasible alternative.

Interpretation of the three remedial methods applied during the pilot test indicates that site remediation in areas impacted with petroleum hydrocarbons within the soil and groundwater may be accomplished utilizing the bioslurping remedial technology. Additionally, modeling

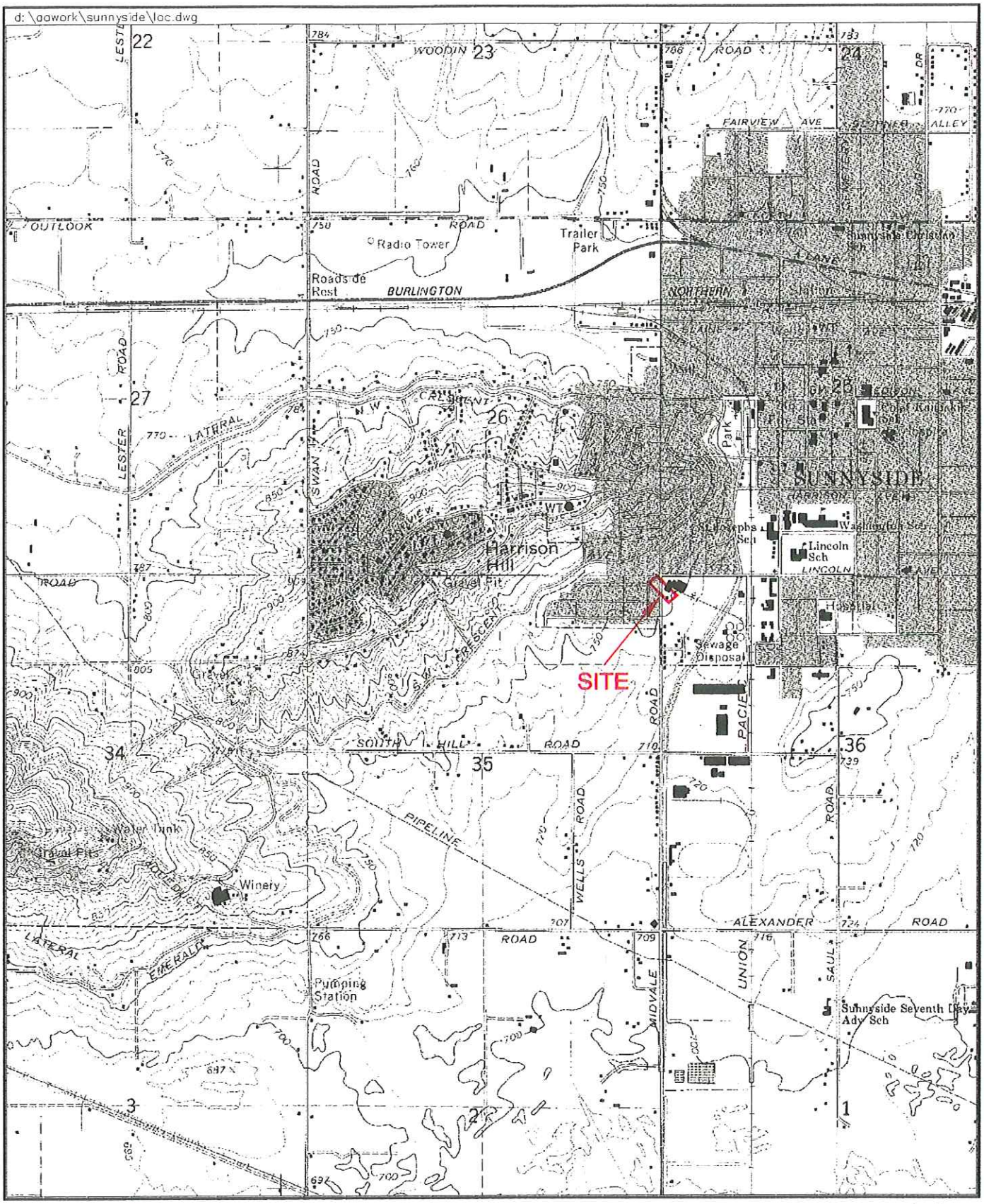
performed utilizing the Bioslurping data has indicated that remediation of chemicals of concern could be accomplished using 9 recovery wells with the stingers placed 5-feet below groundwater/air interface. An applied vacuum of 3.5-IOHg (4-feet of water) and a groundwater recovery rate of 1.3 gpm would be applied to each well.

We appreciate this opportunity to be of service to Time Oil Company. Should you have any questions regarding this assessment report please do not hesitate to contact us at your earliest possible convenience.

Respectfully submitted,
Maxim Technologies, Inc.

Eric J. Polzin, P.G. / EJP 11/23/99
Geologist

Eugene N.J. St. Godard, P.G., C.H.G
Senior Project Hydrogeologist
Spokane Branch Office Manager



From USGS 7.5' Sunnyside, WA Quad

April 1999

N

0 Feet 2000

MAXIM 9904808

Site Vicinity Map
Time Oil Facility No. 01-068
Sunnyside, Washington
FIGURE 1

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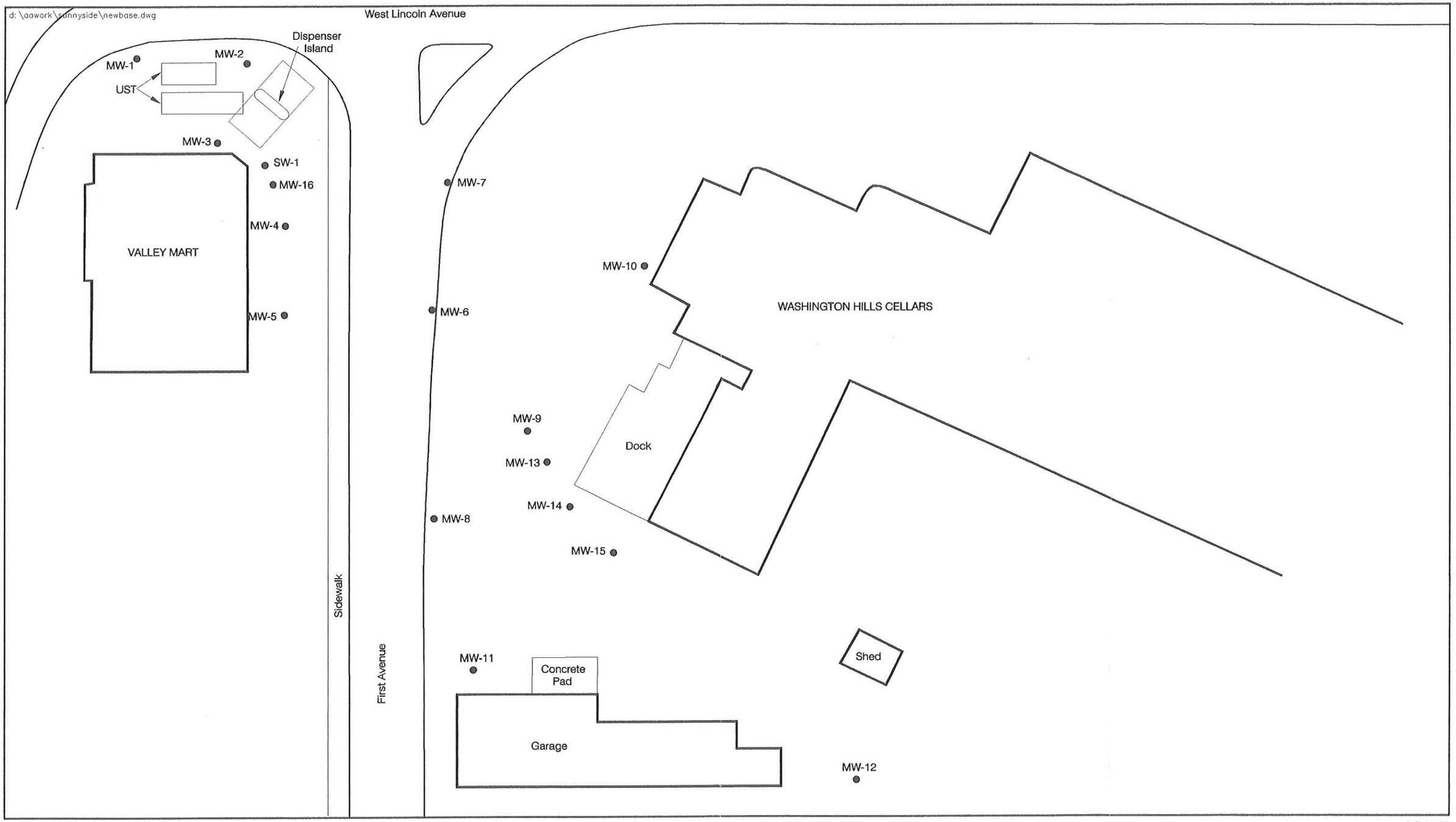

July 1999

N

0 Feet 40

MAXIM 9904808

Site and Exploration Map
Time Oil Facility 01-068
Sunnyside, Washington
FIGURE 2

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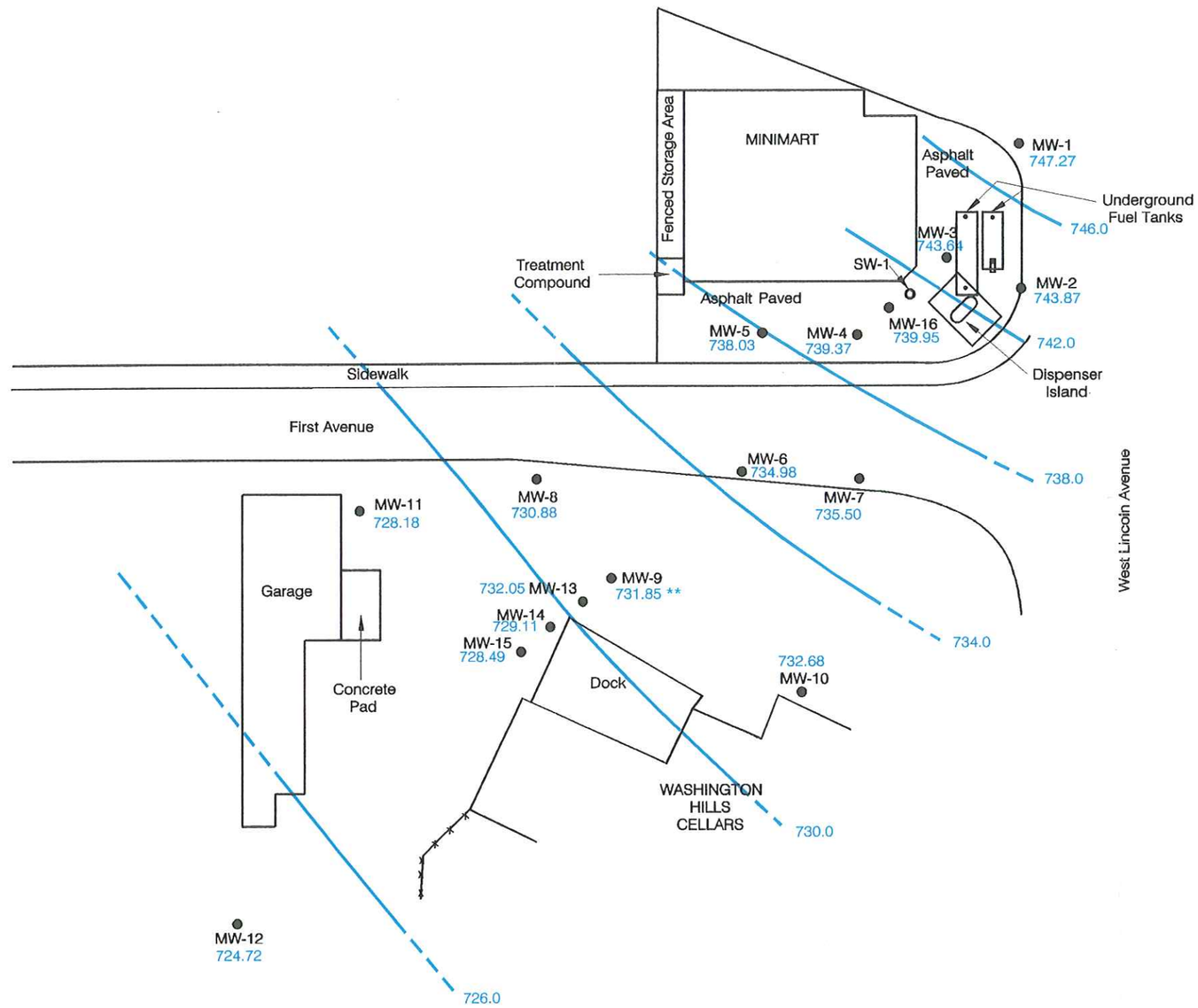


N

0 Feet 50

MAXIM 9904808

** Not Used for Contouring Due to Presence of LNAPL

● Monitoring Well

ND Not Detected at Laboratory Reporting Limit

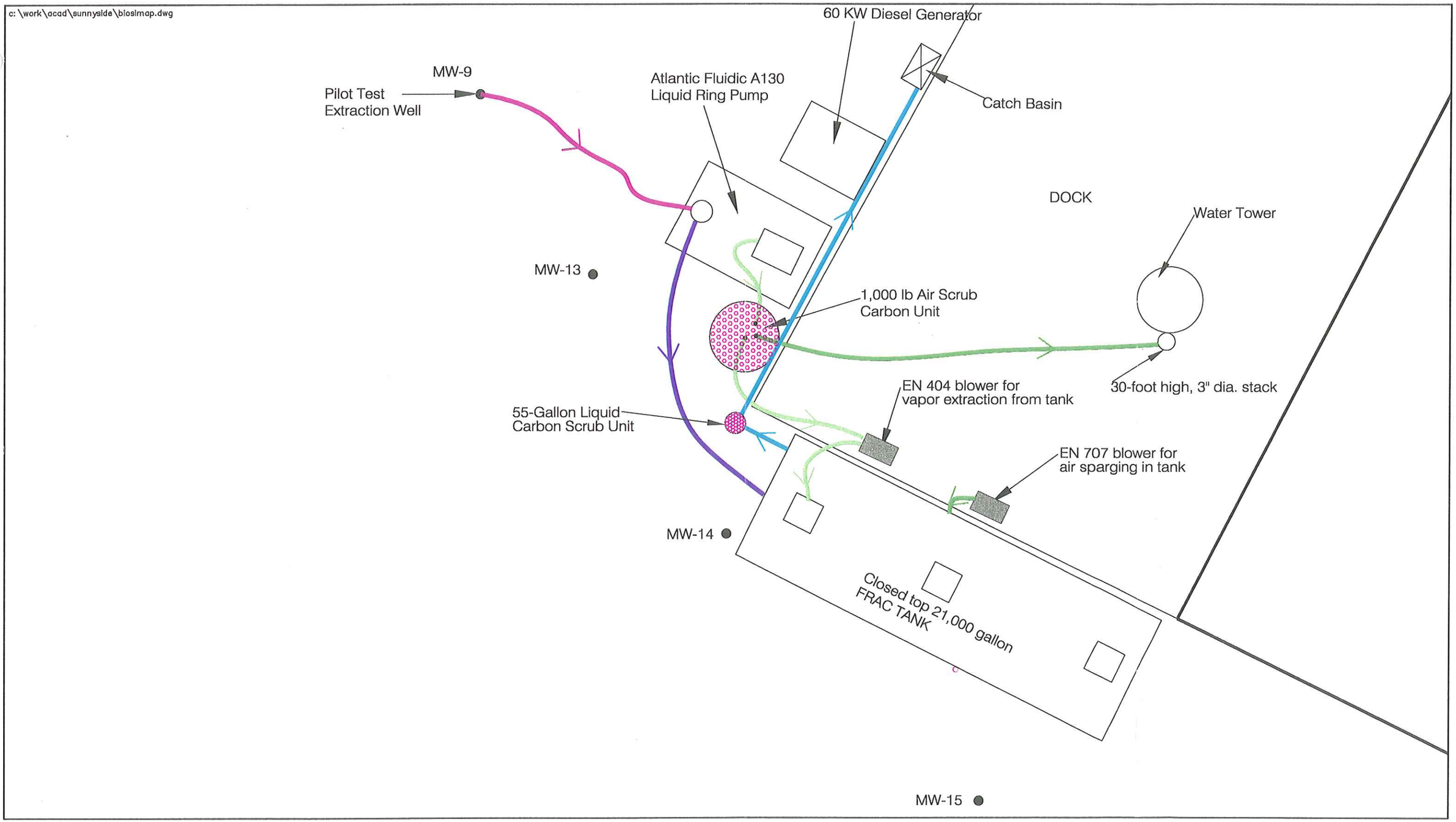
53.03 Groundwater Elevation above Mean Sea Level (feet)

—— Equipotential Line (dashed where inferred)

May 1999

Groundwater Elevation Map
Time Oil Facility No. 01-068
Sunnyside, Washington
FIGURE 3

c:\work\acad\sunnyside\bioslmap.dwg



NOT TO SCALE

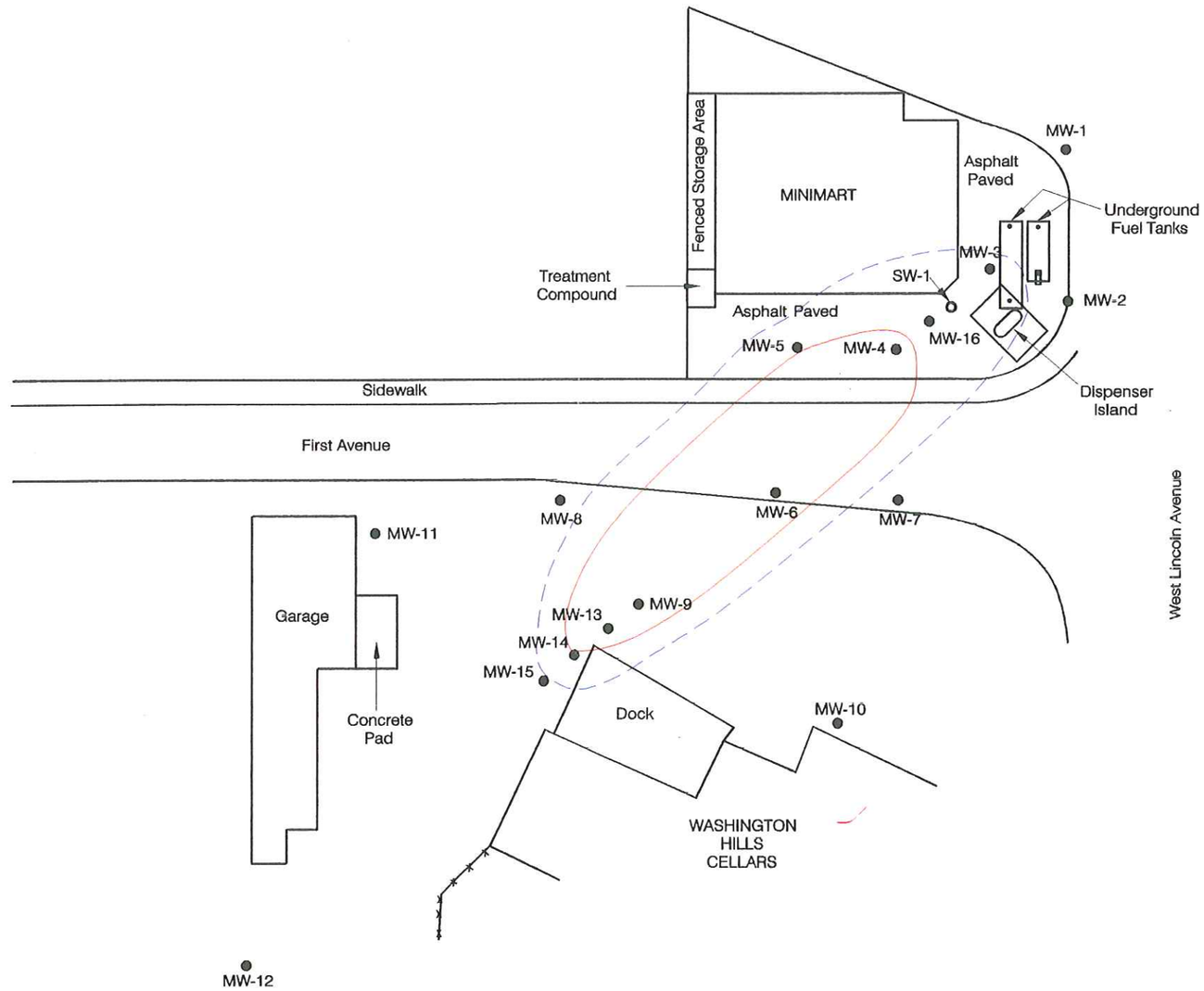
N

MAXIM 9904808.100

Hydrocarbon Impacted Liquid and Vapor
Hydrocarbon Impacted Liquid
Discharged Treated Liquid (Groundwater)
Hydrocarbon Impacted Vapor
Discharged Treated Air

Bioslurping Pilot Test Equipment Configuration
Time Oil Facility 01-068
Sunnyside, Washington
FIGURE No. 4

d: \aawork\sunnyside\extent.dwg



July 1999

N

0 Feet 50

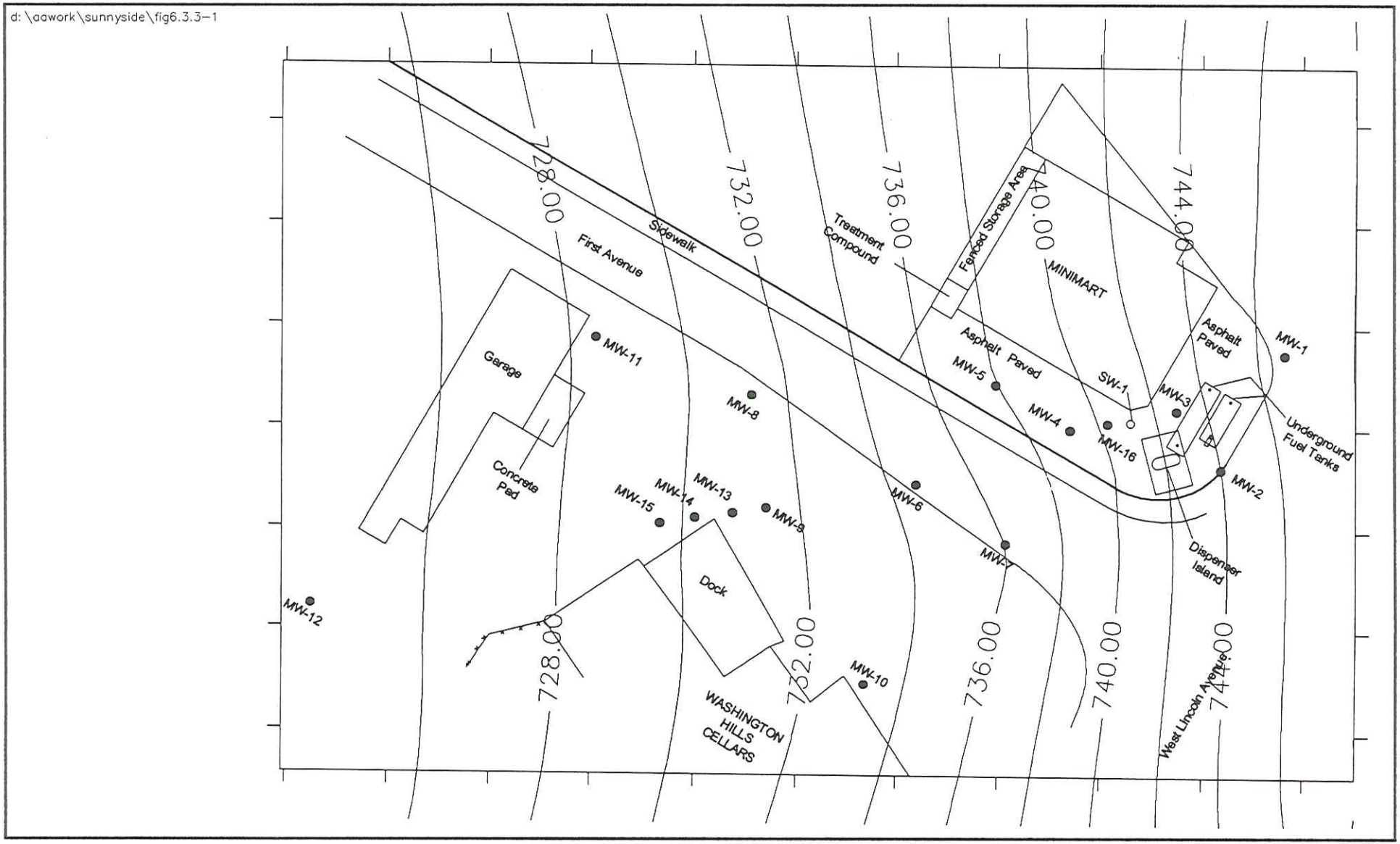
MAXIM 9904808

Monitoring Well

Estimated Residual Boundry

Estlamted Free Product (defined by wells)

Estimated Extent of Petroleum Hydrocarbon Impacts
Time Oil Facility No. 01-068
Sunnyside, Washington
FIGURE 5



July 1999

Time Oil Company
Sunnyside Washington Site
Site Map, Predicted Groundwater Elevations, and Predicted Vacuum Distribution (feet)
FIGURE 6

MAXIM 9904808

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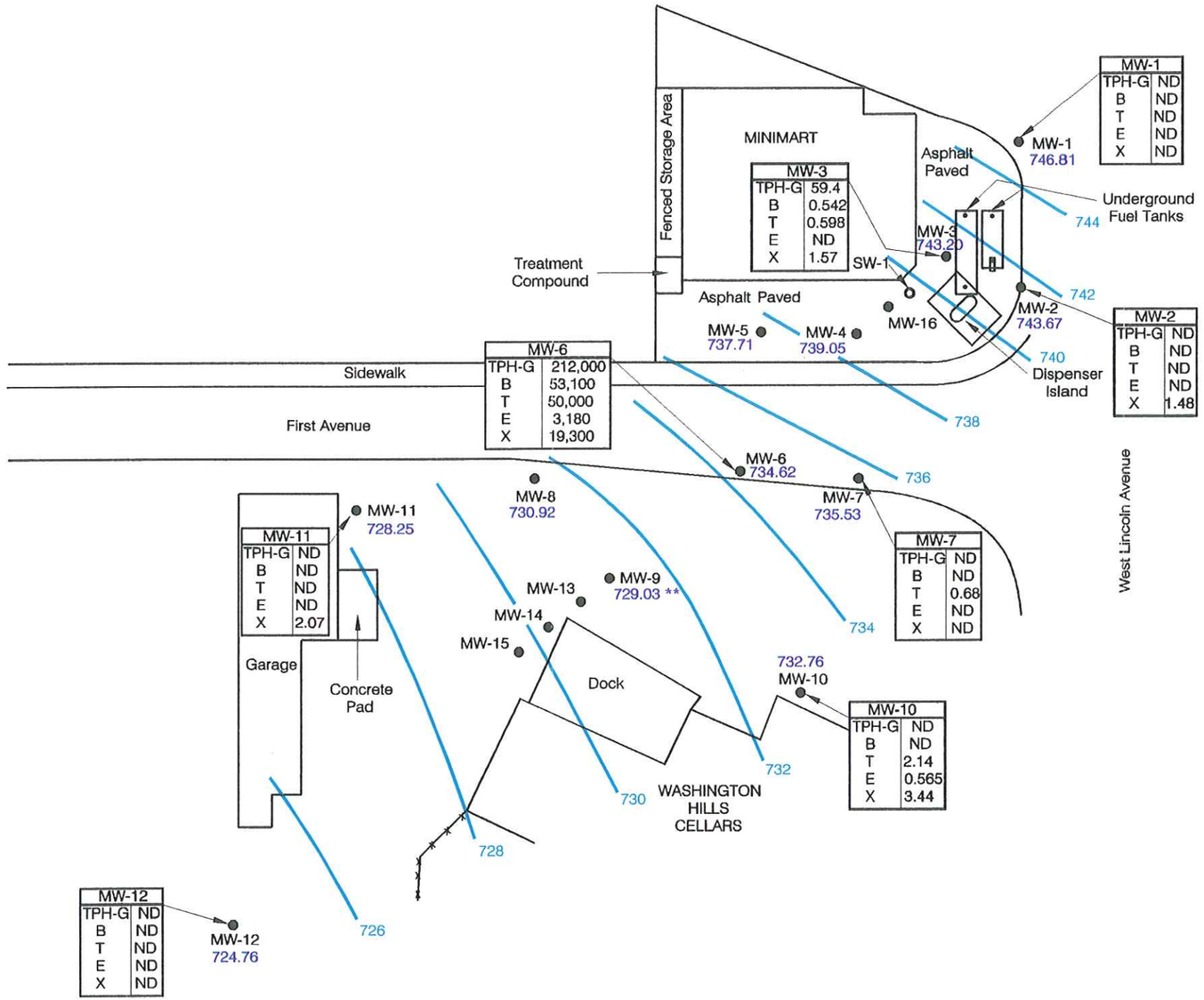


N

0 Feet 50

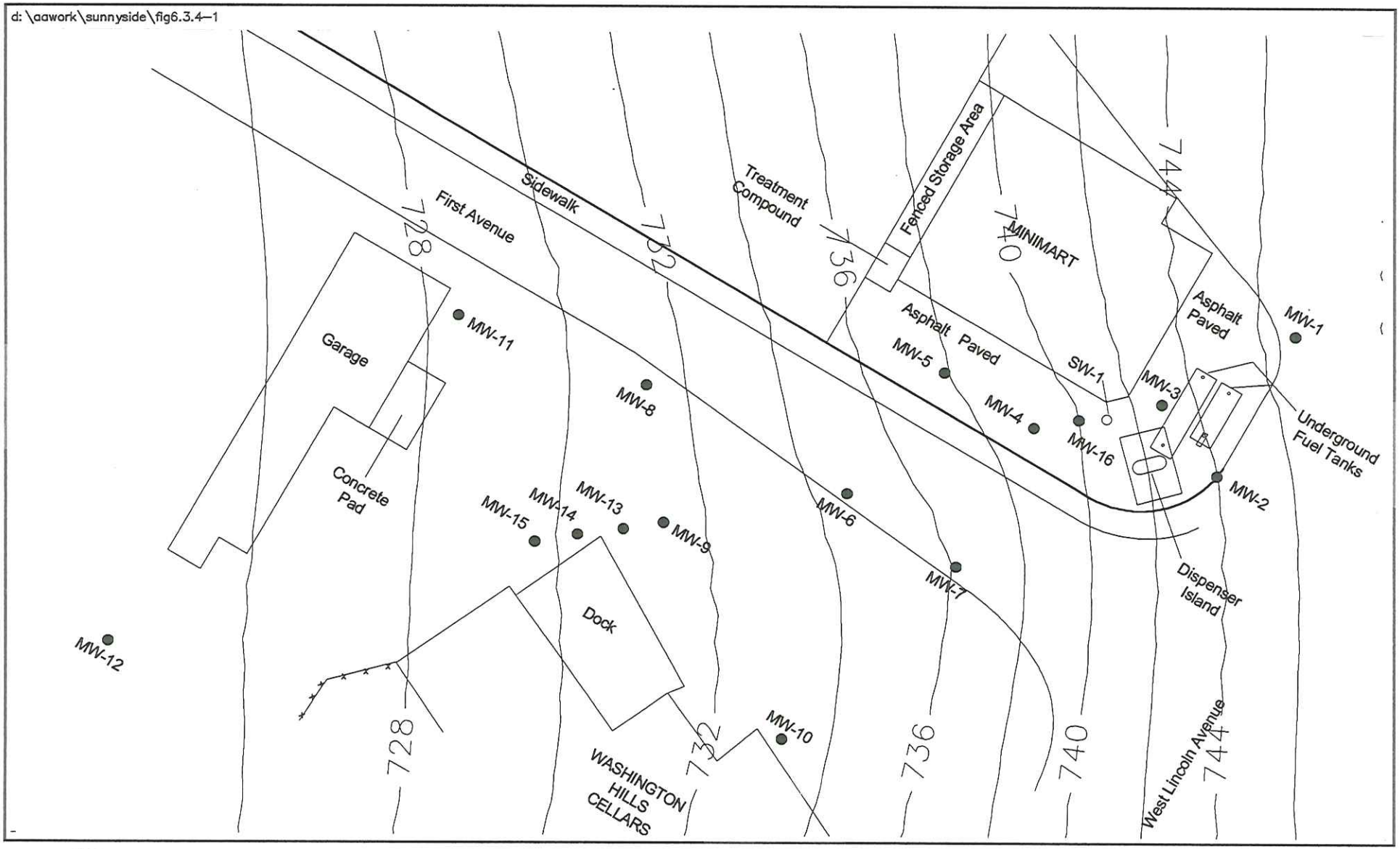
MAXIM 9904808

** Not Used for Contouring Due to Presence of LNAPL
● Monitoring Well
ND Not Detected at Laboratory Reporting Limit
53.03 Groundwater Elevation above Mean Sea Level (feet)
Equipotential Line

TPH-G Total Petroleum Hydrocarbons as Gasoline (ppb)
B Benzene (ppb)
T Toluene (ppb)
E Ethylbenzene (ppb)
X Total Xylenes (ppb)

April 1999

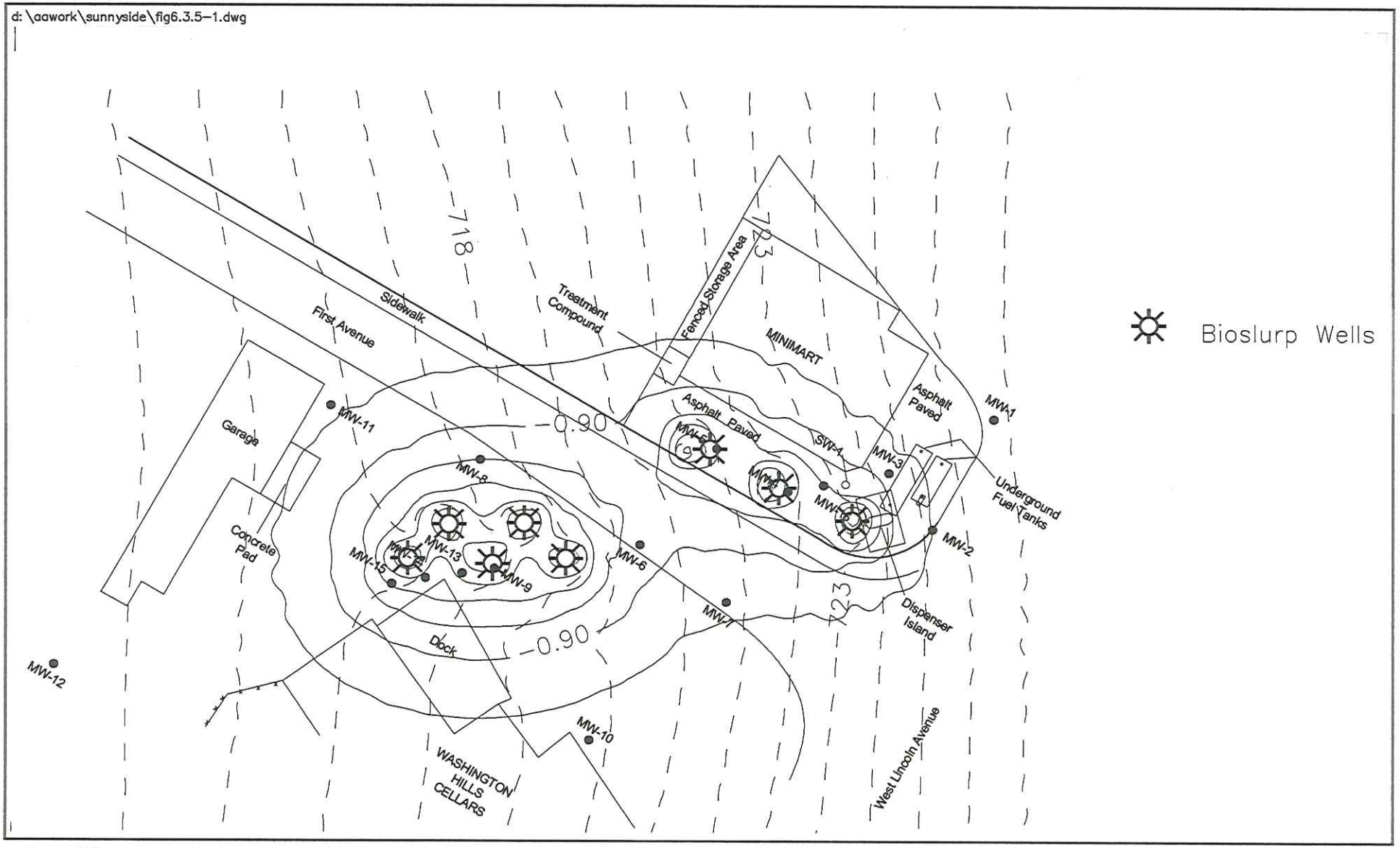
Groundwater Elevation Map
Time Oil Facility No. 01-068
Sunnyside, Washington
FIGURE 7



July 1999

Time Oil Company
Sunnyside Washington Site
Calibrated Flow Model Groundwater Elevations (feet)
FIGURE 8

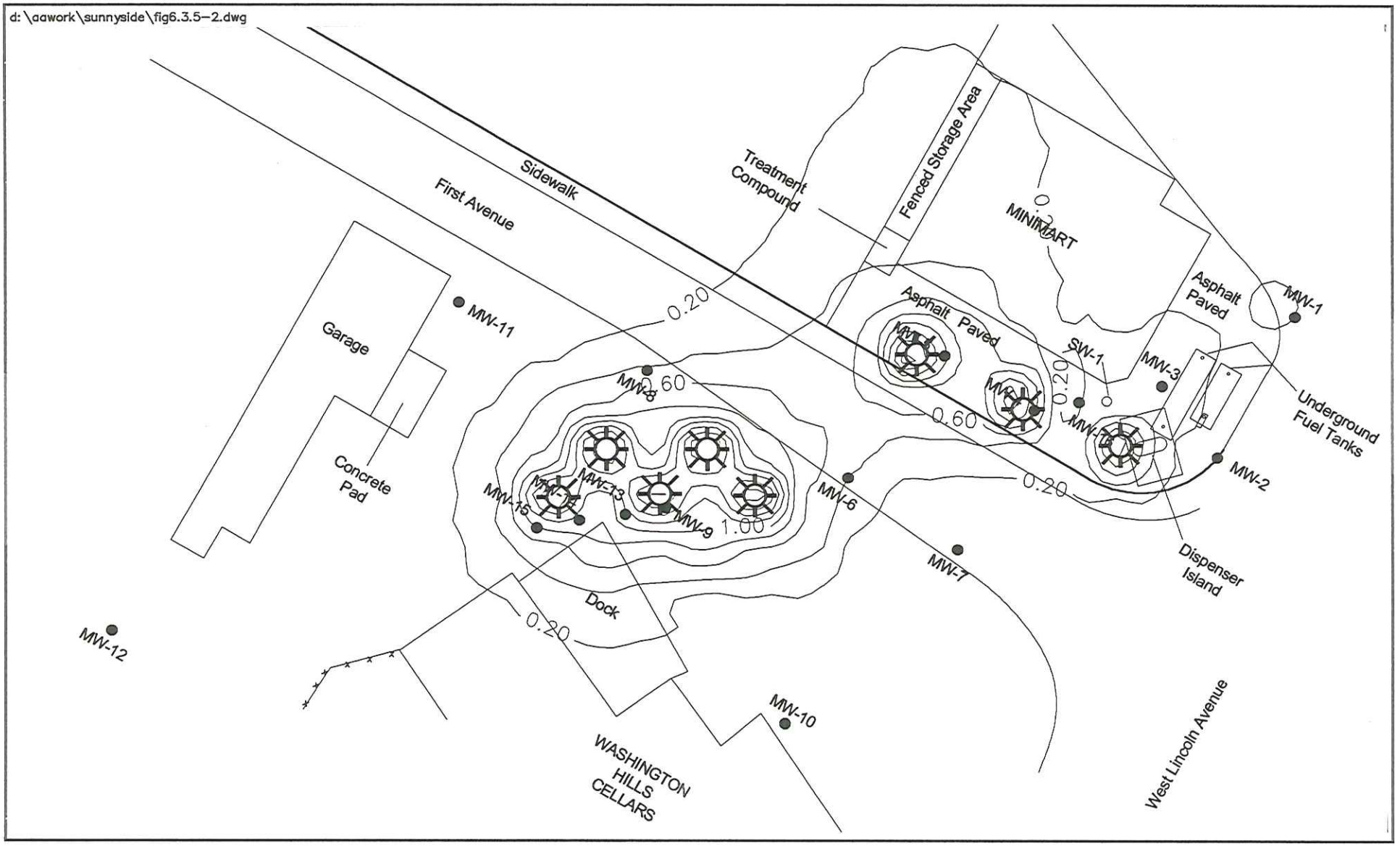
MAXIM 9904808



July 1999

Time Oil Company
Sunnyside Washington Site
Proposed Bioslurp Well Locations
FIGURE 9

MAXIM 9904808



July 1999

N

0 Feet 50

Drawdown of Groundwater (feet)

MAXIM 9904808

Time Oil Company
Sunnyside Washington Site
Predicted Groundwater Drawdown (feet)
FIGURE 10

TABLE 1
Time Oil Property # 01-068
Sunnyside, Wa

Well ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION *(feet)	DEPTH OF WATER *(feet)	PRODUCT THICKNESS *(feet)	GROUNDWATER ELEVATION (b) *(feet)	CHANGE IN ELEVATION *(feet)	B ug/l	T ug/l	E ug/l	X ug/l	TPH-G (c) ug/l	LAB
MW-1	03/13/97	760.28	10.79	-	749.49	-	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-1	06/12/97	760.28	10.86	-	749.42	-0.07	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-1	09/16/97	760.28	10.90	-	749.38	-0.04	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-1	12/16/97	760.28	10.63	-	749.65	0.27	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-1	04/07/98	760.28	12.50	-	747.78	-1.87	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-1	07/02/98	760.28	11.69	-	748.59	0.81	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-1	08/28/98	760.28	10.98	-	749.30	0.71	-	-	-	-	-	-
MW-1	10/21/98	760.28	10.63	-	749.65	0.04	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	-
MW-1	01/27/99	760.28	12.36	-	747.92	-1.73	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<100	-
MW-1	04/14/99	760.28	13.47	-	746.81	-1.11	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<0.5	NCA
MW-2	03/13/97	759.43	12.54	-	746.89	-	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-2	06/12/97	759.43	12.78	-	746.65	-0.24	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-2	09/16/97	759.43	12.00	-	747.43	0.78	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-2	12/16/97	759.43	12.62	-	746.81	-0.62	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-2	04/07/98	759.43	14.48	-	744.95	-1.86	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-2	07/02/98	759.43	14.04	-	745.39	0.44	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<50.0	NCA
MW-2	08/28/98	759.43	13.32	-	746.11	0.72	-	-	-	-	ND<250	SA
MW-2	10/21/98	759.43	13.09	-	746.34	0.23	ND<0.5	ND<0.5	ND<0.5	ND<1.5	-	-
MW-2	01/27/99	759.43	14.60	-	744.83	-1.51	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-2	04/14/99	759.43	15.76	-	743.67	-1.16	ND<0.5	ND<0.5	ND<0.5	1.48	ND<100	SA
MW-3	03/13/97	758.11	11.81	-	746.30	-	985	2,410	384	1,540	ND<50.0	NCA
MW-3	06/12/97	758.11	13.04	-	745.07	-1.23	553	1,240	159	1,190	12,900	NCA
MW-3	09/16/97	758.11	11.30	-	746.81	1.74	1,670	5,230	706	1,040	4,430	NCA
MW-3	12/16/97	758.11	11.78	-	746.33	-0.48	1,210	5,500	1,010	5,190	36,800	NCA
MW-3	04/07/98	758.11	13.68	-	744.43	-1.90	55	50.9	94	120	28,300	NCA
MW-3	07/02/98	758.11	13.27	-	744.84	0.41	38	90	23	180	1,300	NCA
MW-3	08/28/98	758.11	12.44	-	745.67	0.83	-	-	-	-	2,000	SA
MW-3	10/21/98	758.11	12.38	-	745.73	0.06	24	510	250	820	-	-
MW-3	01/27/99	758.11	13.81	-	744.30	-1.43	3.80	1.80	17	8.50	5,600	SA
MW-3	04/14/99	758.11	14.91	-	743.20	-1.10	0.542	0.598	ND<0.5	1.57	370	SA
MW-4	03/13/97	756.89	14.75	-	742.14	-	19,000	29,900	2,330	1,210	59.4	NCA
MW-4	06/12/97	756.89	15.89	0.30	741.26	-0.91	-	-	-	-	122,000	NCA
MW-4	09/16/97	756.89	14.73	-	742.16	0.93	26,700	35,100	2,530	15,900	185,000	NCA
MW-4	12/16/97	756.89	15.22	-	741.67	-0.49	20,900	25,300	1,610	12,200	149,000	NCA
MW-4	04/07/98	756.89	15.59	0.30	741.56	-0.14	-	-	-	-	-	-
MW-4	07/02/98	756.89	16.47	Trace	740.42	-1.11	-	-	-	-	-	-
MW-4	08/28/98	756.89	16.09	0.02	740.82	0.38	-	-	-	-	-	-
MW-4	10/21/98	756.89	16.18	Trace	740.71	-0.09	-	-	-	-	-	-
MW-4	01/27/99	756.89	17.04	0.01	739.86	-0.86	-	-	-	-	-	-
MW-4	04/14/99	756.89	17.87	0.03	739.05	-0.81	-	-	-	-	-	NCA
MTCA Method A Cleanup Levels for Groundwater							5.00	40.00	30.00	20.00	1,000	

TABLE 1
Time Oil Property # 01-068
Sunnyside, Wa

Well ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION *(feet)	DEPTH OF WATER *(feet)	PRODUCT THICKNESS *(feet)	GROUNDWATER ELEVATION (b) *(feet)	CHANGE IN ELEVATION *(feet)	B ug/l	T ug/l	E ug/l	X ug/l	TPH-G (c) ug/l	LAB
MW-5	03/13/97	755.81	14.84	-	740.97	-	940	23,500	1,960	9,950	100,000	NCA
MW-5	06/12/97	755.81	15.76	-	740.05	-0.92	16,300	32,100	1,190	8,200	114,000	NCA
MW-5	09/16/97	755.81	15.18	-	740.63	0.58	17,300	38,500	2,440	14,800	174,000	NCA
MW-5	12/16/97	755.81	15.57	-	740.24	-0.39	18,900	46,900	2,660	16,900	89,000	NCA
MW-5	04/07/98	755.81	16.75	-	739.06	-1.18	9,900	32,900	2,128	12,000	151,000	NCA
MW-5	07/02/98	755.81	16.60	-	739.21	0.15	13,000	43,222	27,000	20,000	93,000	SA
MW-5	08/28/98	755.81	16.23	-	739.58	0.37	-	-	-	-	-	-
MW-5	10/21/98	755.81	16.56	0.01	739.26	-0.34	-	-	-	-	-	-
MW-5	01/27/99	755.81	17.37	Trace	738.44	-0.80	-	-	-	-	-	-
MW-5	04/14/99	755.81	18.38	0.33	737.71	-0.73	-	-	-	-	-	-
MW-6	03/13/97	753.81	15.97	-	737.84	-	33,900	27,100	1,860	10,200	108,000	NCA
MW-6	06/12/97	753.81	17.10	0.18	736.86	-1.00	-	-	-	-	-	NCA
MW-6	09/16/97	753.81	16.67	-	737.14	0.30	66,500	91,300	9,880	64,500	893,000	NCA
MW-6	12/16/97	753.81	17.06	-	736.75	-0.39	6,630	65,600	3,500	22,800	265,000	NCA
MW-6	04/07/98	753.81	17.92	0.18	736.04	-0.73	-	-	-	-	-	NCA
MW-6	07/02/98	753.81	18.46	0.25	735.56	-0.68	-	-	-	-	-	SA
MW-6	08/28/98	753.81	18.09	0.18	735.87	0.37	-	-	-	-	-	-
MW-6	10/21/98	753.81	18.17	0.02	735.66	-0.08	-	-	-	-	-	-
MW-6	01/27/99	753.81	18.84	0.09	735.05	-0.67	-	-	-	-	-	-
MW-6	04/14/99	753.81	19.19	-	734.62	-0.43	53,100	50,000	3,180	19,300	212,000	NCA
MW-7	03/13/97	755.44	16.64	-	738.80	-	0.793	0.685	ND<0.5	ND<1.0	ND<80.0	NCA
MW-7	06/12/97	755.44	17.65	-	737.79	1.01	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-7	09/16/97	755.44	17.40	-	738.04	0.25	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-7	12/16/97	755.44	17.66	-	737.78	-0.26	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-7	04/07/98	755.44	18.58	-	736.86	-0.92	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<50.0	NCA
MW-7	07/02/98	755.44	18.87	-	736.57	-0.29	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<250	SA
MW-7	08/28/98	755.44	18.47	-	736.97	0.40	-	-	-	-	-	-
MW-7	10/21/98	755.44	18.62	-	736.82	-0.15	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-7	01/27/99	755.44	19.30	-	736.14	-0.68	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<100	SA
MW-7	04/14/99	755.44	19.91	-	735.53	-0.61	ND<0.5	0.68	ND<0.5	ND<1.0	ND<50.0	NCA
MW-8	03/13/97	751.46	17.37	-	734.09	-	1.29	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-8	06/12/97	751.46	18.31	-	733.15	-0.94	1.41	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-8	09/16/97	751.46	18.52	-	732.94	-0.21	1.42	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-8	12/16/97	751.46	18.87	-	732.59	-0.35	1.09	ND<0.5	ND<0.5	ND<1.0	ND<80.0	NCA
MW-8	04/07/98	751.46	19.16	-	732.30	-0.29	0.675	ND<0.5	ND<0.5	ND<1.0	ND<50.0	NCA
MW-8	07/02/98	751.46	19.59	-	731.87	-0.43	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-8	08/28/98	751.46	19.72	-	731.74	-0.13	-	-	-	-	-	-
MW-8	10/21/98	751.46	19.99	-	731.47	-0.27	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<100	SA
MW-8	01/27/99	751.46	20.33	-	731.13	-0.34	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<100	SA
MW-8	04/14/99	751.46	20.54	-	730.92	-0.21	-	-	-	-	-	-
MW-9	08/28/98	751.25	19.50	-	731.75	-	4,300	5,300	310	2,100	22,000	SA
MW-9	10/21/98	751.25	20.65	-	730.60	-1.15	22,000	21,000	100	9,600	50,000	SA
MW-9	01/27/99	751.25	21.70	0.98	730.38	-1.07	-	-	-	-	-	-
MW-9	04/14/99	751.25	22.22	1.29	730.13	-0.26	-	-	-	-	-	-
MTCA Method A Cleanup Levels for Groundwater							5.00	40.00	30.00	20.00	1,000	

TABLE 1
Time Oil Property # 01-068
Sunnyside, Wa

Well ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION *(feet)	DEPTH OF WATER *(feet)	PRODUCT THICKNESS *(feet)	GROUNDWATER ELEVATION (b) *(feet)	CHANGE IN ELEVATION *(feet)	B ug/l	T ug/l	E ug/l	X ug/l	TPH-G (c) ug/l	LAB
MW-10	10/21/98	752.83	19.09	-	733.74	-	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-10	01/27/99	752.83	19.66	-	733.17	-0.57	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-10	04/14/99	752.83	20.07	-	732.76	-0.41	ND<0.5	2.14	0.565	3.44	ND<50.0	NCA
MW-11	08/28/98	748.57	19.73	-	728.84	-3.92	ND<0.5	0.6	ND<0.5	ND<1.5	ND<250	SA
MW-11	10/21/98	748.57	20.00	-	728.57	-0.27	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-11	01/27/99	748.57	20.12	-	728.45	-0.12	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<100	SA
MW-11	04/14/99	748.57	20.32	-	728.25	-0.20	ND<0.5	ND<0.5	ND<0.5	2.07	ND<50.0	NCA
MW-12	08/28/98	744.29	19.30	-	724.99	-3.26	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-12	10/21/98	744.29	19.51	-	724.78	-0.21	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<250	SA
MW-12	01/27/99	744.29	19.50	-	724.79	0.01	ND<0.5	ND<0.5	ND<0.5	ND<1.5	ND<100	SA
MW-12	04/14/99	744.29	19.53	-	724.76	-0.03	ND<0.5	ND<0.5	ND<0.5	ND<1.0	ND<50.0	NCA
MTCA Method A Cleanup Levels for Groundwater							5.00	40.00	30.00	20.00	1,000	

ABBREVATIONS:

B	Benzene	THP-G	Total Petroleum Hydrocarbons as gasoline	-	Not analyzed/measured/applicable
T	Toluene	ug/l	Micrograms per liter	NCA	North Creek Analytical
E	Ethylbenzene	ND	Not detected above the reported detection limit	SA	Speciality Analytical
X	Total Xylenes				

Note: Groundwater Elevation = Casing Elevation - (Depth of Water-(Product thickness *0.85)). Groundwater from past events were corrected using this formula to reflect depression by product.

Table 2
Summary of Soil Sampling Analytical Data
Time Oil Co. Property # 01-068
Sunnyside, WA

Boring	Sample Number	Sample Interval (in feet)	PID (ppm)	Gasoline Range Hydrocarbons (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylenes (total) (mg/kg)
MW-13	MW-13/S-2	10-11.5	21.3	<5.0	<0.05	0.0518	<0.05	<0.1
	MW-13/S-3	15-17	460	32.0	2.08	1.78	0.211	4.60
	MW-13/S-4	17-19	2617	287	7.08	20.4	4.73	29.9
	MW-13/S-5	19-21	2677	153	10.3	19.6	2.94	17.9
	MW-13/S-6	21-23	48	23.5	5.29	5.87	0.419	2.86
MW-14	MW-14/S-3	15-16.5	25.1	<5.0	<0.05	<0.05	<0.05	<0.1
	MW-14/S-4	20-21.5	398	<5.0	2.78	<0.05	<0.05	<0.1
	MW-14/S-5	25-26.5	32.4	<5.0	0.0726	<0.05	<0.05	<0.1
MW-15	MW-15/S-4	17-19	28.8	<5.0	<0.05	<0.05	<0.05	<0.1
	MW-15/S-5	19-21	31.6	<5.0	<0.05	<0.05	<0.05	<0.1
	MW-15/S-6	21-23	35.9	<5.0	0.0986	<0.05	<0.05	<0.1
SW-1	SW-1/S-2	10-11.5	169	5.28	0.358	0.344	0.114	0.587
	SW-1/S-3	15-17	3047	314	4.29	17.5	5.15	31.0
	SW-1/S-4	17-19	2100	48.1	3.01	5.44	0.762	6.75
	SW-1/S-5	19-21	283	5.94	0.268	0.130	0.0531	0.178
	SW-1/S-6	21-23	117	36.0	0.829	1.44	0.474	3.58
	SW-1/S-7	23-25	39.7	<5.0	0.0919	0.158	<0.05	0.278
MTCA Method A Cleanup Levels for Soil				100.0	0.5	40.0	20.0	20.0

Table 3
Summary of Groundwater Analytical Data
Air Sparge Test
Time Oil Co. Property # 01-068
Sunnyside, WA

Well #		Gasoline Range Hydrocarbons (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (total) (ug/l)	Calcium (mg/l)	Iron (mg/l)	Magnesium (mg/l)	Arsenic (mg/l)	Chromium (mg/l)	Lead (mg/l)	Manganese (mg/l)	Zinc (mg/l)
MW-2	A	<50.0	<0.5	<0.5	<0.5	<1.0	44.0	<0.150	16.0	0.0230	0.00339	<0.001	<0.01	<0..01
MW-3	A	1120	32.3	27.6	25.5	206	80.8	<0.150	28.1	0.00418	0.00410	<0.001	1.16	<0.01
MW-16	A	110000	21700	22000	1300	11900	99.3	<0.150	41.5	0.00965	0.00622	<0.001	3.28	<0.01
SW-1	A	739	31.6	83.8	17.8	93.0	61.4	<0.150	20.0	0.0116	0.00271	<0.001	0.195	<0.01
MW-2	B	<50.0	<0.5	<0.5	<0.5	<1.0	35.5	<0.150	13.0	0.0272	0.00198	<0.001	<0.01	<0.01
MW-3	B	693	21.2	10.7	10.4	137	68.9	<0.150	22.9	0.00310	0.00194	<0.001	0.724	<0.01
MW-16	B	140000	30400	31000	2040	17300	101	<0.150	41.2	0.00825	0.00393	<0.001	2.98	0.0625
SW-1	B	89.8	0.553	2.10	0.727	11.6	48.0	<0.150	15.3	0.0118	0.00144	<0.001	0.0208	<0.01

A - pre air sparge groundwater sampling
B - post air sparge groundwater sampling

Table 4
Summary of Groundwater Analytical Data
Bioslurp Test
Time Oil Co. Property # 01-068
Sunnyside, WA

Well #		Gasoline Range Hydrocarbons (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethylbenzene (ug/l)	Xylenes (total) (ug/l)
MW-8	A	69.5	0.882	2.93	1.11	8.65
MW-9	A	NSP	NSP	NSP	NSP	NSP
MW-10	A	<50.0	<0.5	1.07	0.653	4.74
MW-14	A	834	1340	26.1	4.90	26.7
MW-15	A	<50.0	307	<0.5	<0.5	<1.0
WHC prod well	A	<50.0	<0.5	<0.5	<0.5	<1.0
MW-8	B	<50.0	2.45	3.43	<0.5	2.31
MW-9	B	106000	11700	7470	1060	9240
MW-10	B	<50.0	<0.5	<0.5	<0.5	<1.0
MW-14	B	1270	2330	52.9	3.59	45.6
MW-15	B	<50.0	137	<0.5	<0.5	<1.0
WHC prod well	B	<50.0	<0.5	<0.5	<0.5	<1.0

NSP - not sampled due to free product
A - pre bioslurp groundwater monitoring
B - post bioslurp groundwater monitoring

Table 5
Summary of Air Sampling Analytical Data
Time Oil Co. Property # 01-068
Sunnyside, WA

Sample #	BES-1A	BES-1B	BES-2A	BES-2B	BES-3A	BES-3B	SVES-1A	SVES-1B	VET-1A	VET-1B
Compound	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)
Ethylene	<1300	<1300	<2500	<500	<500	<500	77	<250	370	<250
Acetylene	<2500	<2500	<5000	<1000	<1000	<1000	120	<500	<500	<500
Ethane	<1300	<1300	<2500	1,200	950	<500	<25	<250	<250	<250
Propylene	<1300	<1300	<2500	<500	<500	<500	<25	<250	<250	<250
Propane	<1300	4,100	5,300	2,400	2,300	1,500	34	530	<250	510
Methylacetylene	<1300	<1300	<2500	<500	<500	<500	<25	<250	<250	<250
Isobutane	1,900	130,000	160,000	80,000	82,000	53,000	1,400	37,000	12,000	24,000
Isobutylene	<1300	7,700	8,500	5,700	6,200	4,000	51	1,100	380	910
1-Butene	<1300	6,900	8,700	4,600	5,100	3,300	69	1,300	490	980
1,3-Butadiene	<1300	<1300	<2500	<500	<500	<500	<25	<250	<250	<250
n-Butane	9,300	740,000	870,000	500,000	520,000	340,000	7,400	200,000	76,000	140,000
trans-2-Butene	<1300	16,000	17,000	12,000	13,000	8,900	140	3,000	990	2,400
2,2-Dimethylpropane	<1300	4,800	6,800	3,000	2,800	2,300	46	1,200	600	1,000
Ethylacetylene	<1300	<1300	<2500	<500	<500	<500	<25	<250	<250	<250
cis-2-Butene	<1300	16,000	18,000	12,000	13,000	9,200	150	2,900	1,100	2,400
Isopentane	70,000	1,300,000	1,500,000	860,000	920,000	720,000	12,000	320,000	190,000	340,000
Dimethylacetylene	<1300	<1300	<2500	<500	<500	<500	<25	<250	<250	<250
1-Pentene	2,100	35,000	36,000	25,000	27,000	22,000	330	7,900	4,400	8,000
2-Methyl-1-butene	5,600	74,000	79,000	52,000	57,000	47,000	720	16,000	9,200	16,000
n-Pentane	63,000	660,000	720,000	440,000	480,000	400,000	6,100	170,000	110,000	180,000
Isoprene	<1300	<1300	<2500	1,000	1,100	1,100	<25	<250	<250	<250
trans-2-Pentene	6,900	75,000	77,000	54,000	59,000	50,000	750	18,000	11,000	19,000
cis-2-Pentene	3,900	38,000	40,000	28,000	31,000	26,000	380	8,600	5,300	9,300
2-Methyl-2-butene	14,000	110,000	120,000	77,000	85,000	73,000	1,100	25,000	15,000	27,000
2,2-Dimethylbutane	7,500	39,000	47,000	25,000	26,000	22,000	370	9,700	7,700	13,000
Cyclopentene	2,800	14,000	15,000	10,000	11,000	9,600	140	2,700	1,800	3,200
4-Methyl-1-pentene	3,800	13,000	14,000	8,200	9,000	3,900	130	3,000	2,500	1,900
Cyclopentane	20,000	79,000	85,000	52,000	57,000	49,000	750	17,000	12,000	21,000
2,3-Dimethylbutane	34,000	95,000	110,000	60,000	62,000	53,000	960	23,000	21,000	33,000
Methyl tert-Butyl Ether	3,100	17,000	17,000	11,000	11,000	8,400	85	2,000	1,900	3,200
2-Methylpentane	180,000	420,000	470,000	250,000	270,000	230,000	4,100	98,000	86,000	140,000
3-Methylpentane	140,000	270,000	310,000	160,000	170,000	140,000	2,600	60,000	56,000	87,000
1-Hexene	8,900	15,000	14,000	8,100	9,000	7,200	140	2,900	2,600	4,100
n-Hexane	220,000	280,000	320,000	150,000	160,000	140,000	2,500	56,000	52,000	82,000
trans-2-Hexene	19,000	23,000	25,000	12,000	13,000	11,000	200	4,200	3,900	6,300
2-Methyl-2-pentene	27,000	31,000	36,000	16,000	18,000	15,000	310	6,200	6,200	9,600
cis-2-Hexene	11,000	12,000	14,000	6,400	7,000	5,800	110	2,200	2,100	3,400
Methylcyclopentane	170,000	200,000	230,000	90,000	98,000	81,000	1,500	32,000	35,000	53,000
2,4-Dimethylpentane	61,000	60,000	76,000	22,000	23,000	20,000	450	8,900	12,000	17,000
Benzene	220,000	250,000	280,000	98,000	110,000	85,000	1,100	19,000	13,000	27,000
Cyclohexane	67,000	67,000	82,000	23,000	24,000	20,000	420	7,900	10,000	15,000
2-Methylhexane	200,000	190,000	230,000	39,000	43,000	37,000	820	16,000	20,000	32,000

Table 5
Summary of Air Sampling Analytical Data
Time Oil Co. Property # 01-068
Sunnyside, WA

Sample #	BES-1A	BES-1B	BES-2A	BES-2B	BES-3A	BES-3B	SVES-1A	SVES-1B	VET-1A	VET-1B
Compound	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)	(ppbv)
2,3-Dimethylpentane	140,000	140,000	180,000	31,000	32,000	29,000	730	13,000	21,000	29,000
3-Methylhexane	210,000	210,000	250,000	40,000	43,000	36,000	840	16,000	22,000	33,000
1-Heptene + Isooctane	180,000	190,000	250,000	31,000	30,000	28,000	730	13,000	24,000	34,000
n-Heptane	200,000	210,000	240,000	27,000	30,000	23,000	540	9,900	12,000	20,000
Methylcyclohexane	67,000	78,000	90,000	10,000	9,700	8,500	190	3,800	6,100	9,800
2,4-Dimethylhexane	54,000	67,000	74,000	6,000	6,500	5,200	160	2,700	4,800	7,200
2,3,4-Trimethylpentane	84,000	110,000	130,000	8,800	9,400	7,500	200	4,100	7,800	12,000
Toluene	960,000	1,300,000	1,400,000	120,000	120,000	84,000	1,800	28,000	24,000	60,000
2-Methylheptane	81,000	110,000	120,000	7,800	8,100	6,300	170	3,100	4,300	7,700
1-Octene	12,000	18,000	6,200	<750	1,100	2,100	<38	460	670	1,200
n-Octane	54,000	86,000	90,000	4,500	4,700	3,300	86	1,700	1,900	4,400
Ethylbenzene	99,000	200,000	190,000	11,000	10,000	5,400	120	2,000	1,100	5,000
m-Xylene	320,000	600,000	550,000	40,000	38,000	21,000	480	9,300	6,900	25,000
p-Xylene	89,000	190,000	200,000	12,000	12,000	8,800	200	4,300	2,900	8,700
Styrene	<1900	<1900	<3800	<750	<750	<750	<38	<380	<380	<380
o-Xylene	120,000	250,000	230,000	17,000	16,000	8,200	200	4,000	2,800	9,100
1-Nonene	6,200	<2500	<5000	<1000	<1000	<1000	<50	<500	<500	<500
n-Nonene	6,900	16,000	15,000	<1000	<1000	<1000	<50	<500	<500	<500
Cumene	<2500	8,000	<5000	<1000	<1000	<1000	<50	<500	<500	<500
a-Pinene	<2500	<2500	<5000	<1000	<1000	<1000	<50	<500	<500	<500
n-Propylbenzene	11,000	32,000	25,000	2,000	1,600	<1000	<50	<500	<500	<500
m-Ethyltoluene	33,000	94,000	74,000	7,200	5,900	2,500	81	1,300	<500	3,000
p-Ethyltoluene	17,000	48,000	39,000	4,100	3,300	1,500	<50	870	<500	1,700
1,3,5-Trimethylbenzene	20,000	55,000	45,000	4,900	4,000	1,800	69	1,100	770	2,400
o-Ethyltoluene	12,000	35,000	27,000	3,200	2,300	<1000	<50	<500	<500	1,400
b-Pinene	<2500	<2500	<5000	<1000	<1000	<1000	<50	<500	<500	<500
1,2,4-Trimethylbenzene	27,000	92,000	66,000	9,300	7,100	3,200	120	1,600	<1000	3,300
n-Decane	<5000	5,200	<10000	<2000	<2000	<2000	<100	<1000	<1000	<1000
p-Cymene	<5000	<5000	11,000	<2000	<2000	<2000	<100	<1000	<1000	<1000
d-Limonene	<5000	11,000	<10000	<2000	<2000	<2000	<100	<1000	<1000	<1000
1,4-Diethylbenzene	<5000	<5000	<10000	<2000	<2000	<2000	<100	<1000	<1000	<1000
n-Butylbenzene	<5000	13,000	<10000	<2000	<2000	<2000	<100	<1000	<1000	<1000
Total Non-Methane Hydrocarbons (ppmC, v/v)	71,000	10,000	17,000	22,000	7,400	320	6,000	21,000	78,000	40,000

APPENDIX A
SUBSURFACE EXPLORATION PROCEDURES AND EXPLORATORY LOGS

Subsurface Exploration

The field exploration program conducted for this study consisted of advancing five hollow stem auger borings to a minimum depth of 20 to 30-feet below the existing site grade. The borings were accomplished to install four groundwater monitoring wells (MW-13 through MW-16) and one air sparging well (SW-1). The approximate locations of the explorations are illustrated on Figure 2.

The borings were drilled during April 13 and 14, 1999 by Boretec Drilling, Inc. of Spokane, Washington and were continuously observed and logged by an experienced Maxim geologist. The borings were advanced by a trailer mounted Mobile B-24 drill rig utilizing both 4.25 or 3.25-inch inner diameter (ID) hollow stem augers. The 4.25-inch augers were used only at the location of MW-13. As the bore hole appeared to be able to stay open to the total depth explored during well installation, the 3.25-inch augers were used on the next four borings and completely withdrawn prior to well installation.

Characterization of Soils

Soil samples were obtained using the Standard Penetration Test Procedure as described in ASTM: D-1586. The testing and sampling consisted of driving a standard 2-inch outside diameter split barrel sampler a distance of 18 inches into the soil below the auger bit with a 140 pound hammer free falling a distance of 30 inches. The number of blows for each 6-inch interval is recorded and the number of blows required to drive the sampler the final 12 inches is considered the Standard Penetration Resistance ("N") or the blow count which is represented on the boring logs in this appendix. If a total of 50 blows are recorded within a 6-inch interval, the blow count is recorded as 50 blows for the actual number of inches of penetration and is considered refusal. The blow count, or "N" value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. The high gravel, cobble and boulder content of some fluvial and glacial soils often yields unrepresentatively high blow counts due to oversized material. The soil samples retrieved from the split-spoon sampler were classified in the field and a representative portion placed in laboratory prepared glass containers.

Soil Sampling Procedures

Soil samples were typically retrieved starting at 5 feet below the ground surface, at 5-foot intervals thereafter. The soil samples were recovered at each interval using procedures designed to minimize the risk of cross contamination. Prior to the drilling of the boring, the drilling equipment and sample tools were cleaned by a steam cleaner. Between each sampling attempt, the sampling tools were scrubbed with a stiff brush and a detergent solution consisting of Liquinox and warm water, rinsed with potable water then liberal quantities of distilled water. The samples were classified in the field and immediately transferred to laboratory treated glass jars, and tightly sealed with a Teflon-lined threaded cap. Samples were screened in the field with a Photovac Microtip photo ionization detector (PID) and several samples from each boring were selected for laboratory analysis. Samples were stored and transported in a chilled ice chest throughout the field program. Selected soil samples were subsequently transferred to North Creek Analytical in Bothell, Washington in accordance with Maxim Technologies, Inc.® chain of custody procedures.

The boring logs presented in this appendix are based on the drilling action, visual inspection of the samples secured and field logs. The various types of soils are indicated as well as the depths where soils or characteristics of the soils changed. It should be noted that these changes may have been

gradual, and if the changes occurred between sample intervals, the soil contacts are interpreted. Subsurface water conditions are evaluated by observing the moisture condition of the samples, the free water on the sample rods, and in well measurements. Groundwater was interpreted to have been encountered at depths of approximately 15 to 17 feet beneath the ground surface at time of drilling.

Field Headspace Measurements

Each soil sample was screened for the presence of volatile organic compounds to facilitate selecting an appropriate soil sample to submit for chemical analysis. This involved placing approximately 6 ounces of soil directly into a zip-lock baggie. The sample was then shaken vigorously for approximately 15 seconds and a headspace reading was taken after plunging the probe of a Photoionization Detector (PID) detector through the side of the baggie. Field headspace analysis was performed on each sample utilizing a Photovac Microtip Model 100 PID. The highest digital readout value displayed by the instrument was recorded for each sample. This value indicates the total vapor concentration of volatilized organic compounds. These compounds include numerous constituents of petroleum hydrocarbons. However, the PID is not capable of determining the species of these compounds or their concentrations in the soil samples. Consequently, it should be considered merely a rough screening tool that aides in detecting the presence of volatile soil contaminants.

When insufficient soil sample recovery occurred at the subject site, the interval was generally logged from the observation of the drilling action. Soil cuttings generated from the boring were continuously monitored and when elevated organic vapors were noted, a sample of the cuttings was secured for field screening.

Well development

Monitoring wells were developed on April 14, 1999 by surging a 1.5-inch disposable bailer in the well and removing approximately ten well volumes. By the end of the development, the withdrawn water had become essentially sand free and reduced in silt content. Purged groundwater was disposed of on site by placement into the station oil/water separation system.

Monitoring Well Installation

Four of the borings were completed for the purpose of installing 2-inch site monitoring wells. The hollow stem auger casing was advanced into the substrate to depths of approximately 25 (MW-13), 25 (MW-14) 25 (MW-15) and 20-feet (MW-16) below the ground surface and approximately 3 to 9-feet below the groundwater interface. The monitoring wells were screened with 2-inch 0.020 slot well screen from 15 to 25-feet (MW-13 through MW-15) and 7 ½ to 20-feet (MW-16). All monitoring wells were constructed with schedule 40 2-inch PVC casing from the top of the well screen to the surface. The pipe sections were installed inside the annulus of the hollow stem auger casing for MW-13 and in an open borehole for MW-14 through MW-16. During the installation of MW-13, the auger casing was filled periodically with a select sand filter pack and slowly withdrawn to allow the sand to surround the well screen and fill the annulus of the boring to approximately one foot above the top of the well screen. Wells MW-14 through MW-16 sand pack placement consisted of pouring sand down the open bore hole until a depth of approximately two feet above the top of the well screen was reached. The depth to the top of sand was monitored to ensure that caving of the sidewalls did not occur. A 5 -foot (MW-16) and 11-foot (MW-13 through

MW-15) seal consisting of bentonite chip was then placed above the sand filter pack. Above the bentonite seal, a concrete seal was then placed into which a flush-mounted steel well monument was installed. The well was completed by installing a locking cap in the top of the blank PVC pipe.

Sparge Well Installation

One of the borings was completed for the purpose of installing 2-inch in-situ air sparging well. The hollow stem auger casing was advanced into the substrate to depths of approximately 30-feet below the ground surface and approximately 14-feet below the groundwater interface. The monitoring wells were screened with 2-inch 0.020 slot well screen from 23.5 to 26-feet below the ground surface. The top of the well screen was placed approximately 7 ½-feet below the groundwater interface. The well was constructed with schedule 40 2-inch PVC casing from the top of the well screen to the surface. These pipe sections were installed in an open borehole. The sand pack placement consisted of pouring sand down the open bore hole until a depth of approximately one foot above the top of the well screen was reached. The depth to the top of sand was monitored to ensure that caving of the sidewalls did not occur. A 7-foot seal consisting of bentonite chip was then placed above the sand filter pack followed by 13-feet of an aquaguard grout. Above the grout seal, a concrete seal was then placed into which a flush-mounted steel well monument was installed. The well was completed by installing a locking cap in the top of the blank PVC pipe.

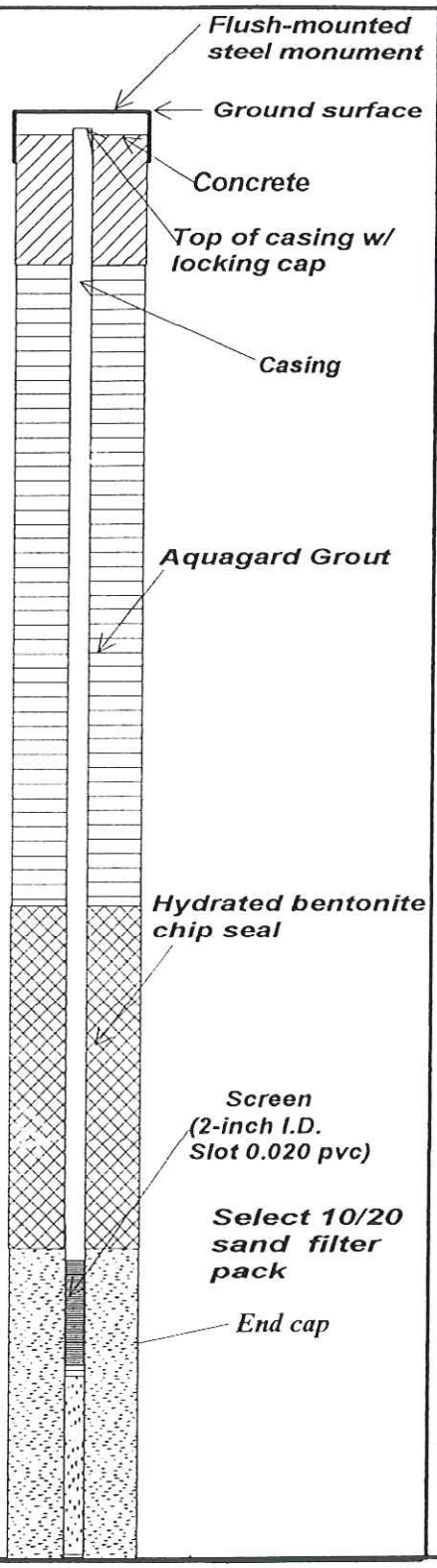
PROJECT *SUNNYSIDE TIME OIL* W.O. *99-04808* WELL NO. *SW-1*

Elevation reference:
Ground surface elevation: 758.13 Casing elevation: 757.85

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*0-4" Asphalt*					
5	*Medium dense, damp to moist, brown, silty fine SAND with two (0.5" - 1" thick) layers of white/gray ash at 5.2' and 5.5' feet depth*		S-1	12	55.9	
10	*Very stiff, moist to wet, brown, fine, sandy SILT with a gray medium to fine SAND interbed at 10.2' depth (1" thick)*		S-2	20	169.0	
15	*Very stiff, wet to saturated, brown SILT with some sand to fine, sandy SILT. Medium to fine SAND bed (3" thick) at 16.7' depth.*		S-3	26	3047	ATD
	Very stiff to hard, saturated, brown, fine sandy SILT with medium to fine SAND interbed (2" thick) at 18.5' depth		S-4	54	2100	
20	*Very stiff to hard, saturated, brown SILT with some sand grading downward to medium fine SAND at 20.5'*		S-5	39	283.0	
	Very stiff to hard, saturated, brown, fine sandy SILT		S-6	38	117.0	
25	*Very stiff to hard, moist to wet, brown, fine, sandy SILT grading downward to gray/brown, medium to fine SAND with trace silt (sand from24.2 to 25')*		S-7	31	39.7	
	Hard, saturated, brown, fine sandy SILT		S-8	46	48.8	
	Hard, saturated, brown, fine sandy SILT to SILT with some fine SAND		S-9	28	29.4	
30	*Very stiff, saturated, brown SILT with some clay and trace fine sand grading downward to fine sandy SILT*		S-10	27	25.7	

Boring terminated at approximately 30.0 feet

AS-BUILT DESIGN



TESTING

LEGEND

MAXIM TECHNOLOGIES, INC.
N. 10220 Nevada, Suite 290
Spokane, Washington 99218

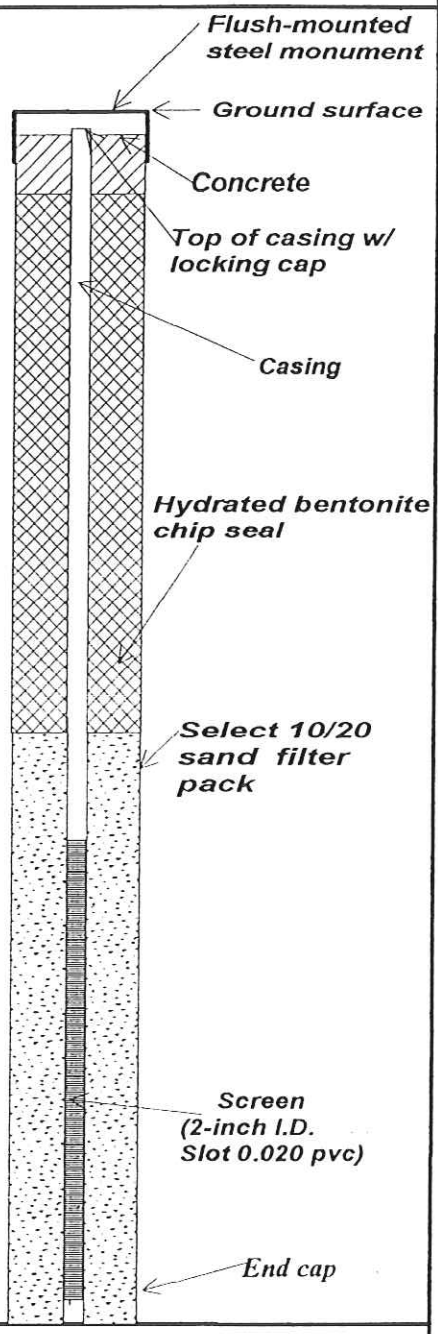
Drilling started: *14 April 1999* **Drilling completed:** *14 April 1999* **Logged by:** *EJP*

PROJECT *SUNNYSIDE TIME OIL* W.O. *99-04808* WELL NO. *MW-13*

Elevation reference:
Ground surface elevation: 750.69 **Casing elevation: 750.25**

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*0-4" Asphalt*					
5	*Very stiff, moist, brown, fine, sandy SILT*		S-1	18	21.8	
10	*Hard, moist, brown, fine sandy SILT with fine to medium sand interbed (1/2" to 1" thick) @ 10.5 and 11.0' depth*		S-2	35	21.3	
15	*Very stiff, wet grading to saturated, brown, fine sandy SILT becomes saturated at 15.6' depth*		S-3	22	460.0	▽ AID
	Very stiff, wet, brown, fine sandy SILT to SILT with some fine sand, saturated, medium to find sand layer at 18.0 -18.5' depth		S-4	26	2617	
20	*Very stiff, saturated, brown, fine sandy SILT and medium to fine SAND, trace silt from 19.5-20.0' depth*		S-5	34	2677	
	Dense, saturated, brown, silty, medium to fine SAND		S-6	31	48	
	Dense, saturated, brown, silty, medium to fine SAND		S-7	31	65	
25	*Boring terminated at approximately 25.0 feet*					
30						

AS-BUILT DESIGN



TESTING

LEGEND

MAXIM TECHNOLOGIES, INC.
N. 10220 Nevada, Suite 290
Spokane, Washington 99218

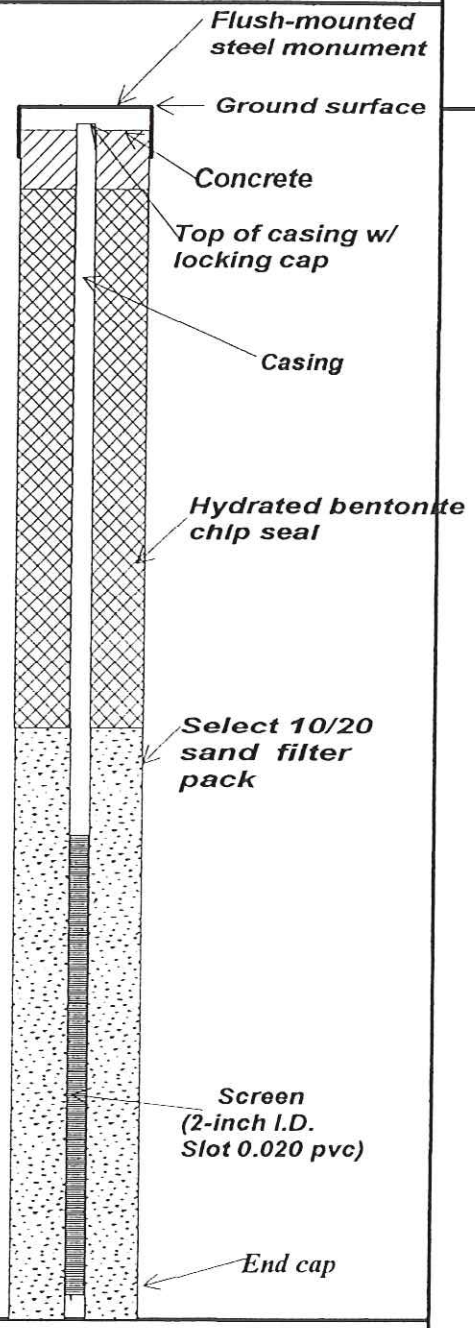
Drilling started: *13 April 1999* **Drilling completed:** *13 April 1999* **Logged by:** *EJP*

PROJECT *SUNNYSIDE TIME OIL* W.O. *99-04808* WELL NO. *MW-14*

Elevation reference:
Ground surface elevation: 750.25 **Casing elevation: 749.88**

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*0-4" Asphalt*					
5	*Stiff, moist, brown, fine, sandy SILT with medium to fine SAND interbeds (0.5" to 1" thick at 5.5 and 6' depth)*		S-1	13	23.2	
10	*Very stiff, moist, brown, fine sandy SILT with one medium to fine SAND interbed (1" thick) at 11' depth*		S-2	26	24.9	
15	*Very stiff, wet grading to saturated, brown, fine sandy SILT*		S-3	26	25.1	ATD
20	*Medium dense, saturated, brown, medium to fine SAND grading to a silty, fine SAND to 21' depth. Very stiff, saturated, brown, SILT with some fine SAND from 21' to 21.5' depth.*		S-4	27	398	
25	*Boring terminated at approximately 25.0 feet*					
	Medium dense, saturated, brown, silty, fine SAND		S-5	26	32.4	
30						

AS-BUILT DESIGN



TESTING

LEGEND

MAXIM TECHNOLOGIES, INC.
N. 10220 Nevada, Suite 290
Spokane, Washington 99218

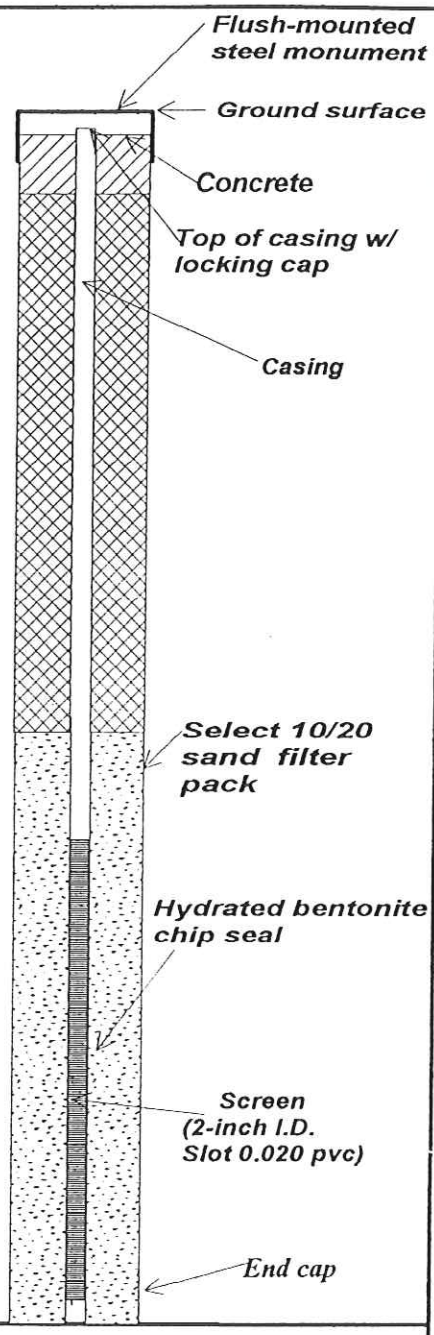
Drilling started: *13 April 1999* **Drilling completed:** *13 April 1999* **Logged by:** *EJP*

PROJECT *SUNNYSIDE TIME OIL* W.O. *99-04808* WELL NO. *MW-15*

Elevation reference:
Ground surface elevation: **Casing elevation:**

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*0-4" Asphalt*					
5	*Medium stiff, moist, brown, fine, sandy SILT*		S-1	7	27.6	
10	*Very stiff, moist, brown, fine sandy SILT with medium to fine SAND interbed at 10.5 to 11' depth*		S-2	22	30.5	
15	*Very stiff, moist grading to saturated, brown, fine sandy SILT and one medium to fine SAND with some silt interbed 1.5" to 2" thick at 16.6' depth*		S-3	31	29.7	ATD
	Medium dense, saturated, brown, silty, fine SAND grading to a medium to fine SAND with some silt to 18.2' depth over a very stiff, saturated, brown SILT with some fine sand		S-4	37	28.8	
20	*Medium dense, saturated, brown,medium to fine SAND with some silt to 20' depth over silty fine SAND to 21' depth*		S-5	29	31.6	
	Medium dense, saturated, brown,medium to fine SAND with some silt		S-6	39	35.9	
	Medium dense, saturated, brown,medium to fine SAND with some silt		S-7	30		
25	*Boring terminated at approximately 25.0 feet*					
30						

AS-BUILT DESIGN



TESTING

LEGEND

MAXIM TECHNOLOGIES, INC.
N. 10220 Nevada, Suite 290
Spokane, Washington 99218

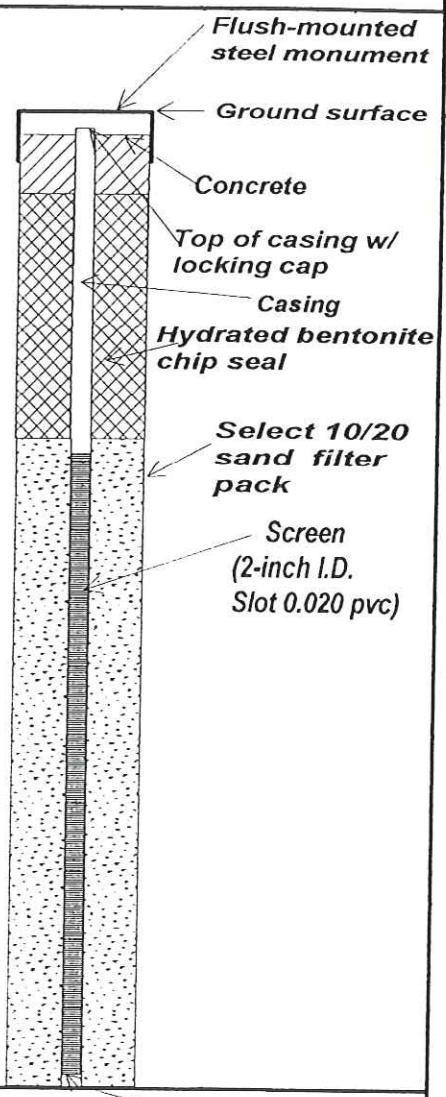
Drilling started: *13 April 1999* **Drilling completed:** *13 April 1999* **Logged by:** *EJP*

PROJECT *SUNNYSIDE TIME OIL* W.O. *99-04808* WELL NO. *MW-16*

Elevation reference:
Ground surface elevation: 757.79 **Casing elevation:** 757.48

DEPTH (feet)	SOIL DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	OVM READING (ppm)	GROUND WATER
0	*0-4" Asphalt*					
5	*Loose, moist to damp, brown, silty, fine SAND one thick white/gray ash layer at 6' depth*		S-1	9	22.6	
10	*Very stiff, moist grafding to wet, brown, fine sandy SILT with one fine SAND interbed @ 10.5' depth*		S-2	26	22.5	
15						AID
20	*Boring terminated at approximately 20 feet*					
25						
30						

AS-BUILT DESIGN



TESTING

LEGEND

MAXIM TECHNOLOGIES, INC.
N. 10220 Nevada, Suite 290
Spokane, Washington 99218

Drilling started: *14 April 1999* **Drilling completed:** *14 April 1999* **Logged by:** *EJP*

APPENDIX B

ANALYTICAL TEST CERTIFICATES - SOIL

www.ncalabs.com

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled:	4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received:	4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	4/22/99 15:06

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-13 / S-2	B904379-02	Soil	4/13/99
MW-13 / S-3	B904379-03	Soil	4/13/99
MW-13 / S-4	B904379-04	Soil	4/13/99
MW-13 / S-5	B904379-05	Soil	4/13/99
MW-13 / S-6	B904379-06	Soil	4/13/99
MW-14 / S-3	B904379-10	Soil	4/13/99
MW-14 / S-4	B904379-11	Soil	4/13/99
MW-14 / S-5	B904379-12	Soil	4/13/99
MW-15 / S-4	B904379-16	Soil	4/13/99
MW-15 / S-5	B904379-17	Soil	4/13/99
MW-15 / S-6	B904379-18	Soil	4/13/99
SW-1 / S-2	B904379-23	Soil	4/14/99
SW-1 / S-3	B904379-24	Soil	4/14/99
SW-1 / S-4	B904379-25	Soil	4/14/99
SW-1 / S-5	B904379-26	Soil	4/14/99
SW-1 / S-6	B904379-27	Soil	4/14/99
SW-1 / S-7	B904379-28	Soil	4/14/99

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled: 4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received: 4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 4/22/99 15:06

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-13 / S-2			**B904379-02**				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/20/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	**0.0518**	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*79.0*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*86.0*	"	
MW-13 / S-3			**B904379-03**				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	**32.0**	mg/kg dry	
Benzene	"	"	"		0.0500	**2.08**	"	
Toluene	"	"	"		0.0500	**1.78**	"	
Ethylbenzene	"	"	"		0.0500	**0.211**	"	
Xylenes (total)	"	"	"		0.100	**4.60**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*80.4*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*73.8*	"	
MW-13 / S-4			**B904379-04**				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		50.0	**287**	mg/kg dry	
Benzene	"	"	"		0.500	**7.08**	"	
Toluene	"	"	"		0.500	**20.4**	"	
Ethylbenzene	"	"	"		0.500	**4.73**	"	
Xylenes (total)	"	"	"		1.00	**29.9**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*125*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*97.1*	"	
MW-13 / S-5			**B904379-05**				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		50.0	**153**	mg/kg dry	
Benzene	"	"	"		0.500	**10.3**	"	
Toluene	"	"	"		0.500	**19.6**	"	
Ethylbenzene	"	"	"		0.500	**2.94**	"	
Xylenes (total)	"	"	"		1.00	**17.9**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*113*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*105*	"	
MW-13 / S-6			**B904379-06**				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		10.0	**23.5**	mg/kg dry	
Benzene	"	"	"		0.100	**5.29**	"	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled: 4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received: 4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 4/22/99 15:06

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-13 / S-6 (continued)			**B904379-06**				**Soil**	
Toluene	0490553	4/20/99	4/21/99		0.100	**5.87**	mg/kg dry	
Ethylbenzene	"	"	"		0.100	**0.419**	"	
Xylenes (total)	"	"	"		0.200	**2.86**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*74.3*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*80.4*	"	
MW-14 / S-3			**B904379-10**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*73.5*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*84.8*	"	
MW-14 / S-4			**B904379-11**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/20/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	**2.78**	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*69.3*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*76.4*	"	
MW-14 / S-5			**B904379-12**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	**0.0726**	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*70.5*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*78.9*	"	
MW-15 / S-4			**B904379-16**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled: 4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received: 4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 4/22/99 15:06

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-15 / S-4 (continued)			B904379-16				Soil	
Xylenes (total)	0490553	4/20/99	4/21/99		0.100	ND	mg/kg dry	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*69.4*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*82.2*	"	
MW-15 / S-5			B904379-17				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	ND	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*72.9*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*81.7*	"	
MW-15 / S-6			B904379-18				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	**0.0986**	"	
Toluene	"	"	"		0.0500	ND	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*71.2*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*78.7*	"	
SW-1 / S-2			B904379-23				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	**5.28**	mg/kg dry	
Benzene	"	"	"		0.0500	**0.358**	"	
Toluene	"	"	"		0.0500	**0.344**	"	
Ethylbenzene	"	"	"		0.0500	**0.114**	"	
Xylenes (total)	"	"	"		0.100	**0.587**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*74.4*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*83.5*	"	
SW-1 / S-3			B904379-24				Soil	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		50.0	**314**	mg/kg dry	
Benzene	"	"	"		0.500	**4.29**	"	
Toluene	"	"	"		0.500	**17.5**	"	
Ethylbenzene	"	"	"		0.500	**5.15**	"	
Xylenes (total)	"	"	"		1.00	**31.0**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*111*	*%*	

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**Refer to end of report for text of notes and definitions.*

Joy B Chang, Project Manager

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled: 4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received: 4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 4/22/99 15:06

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
SW-1 / S-3 (continued)			**B904379-24**				**Soil**	
Surrogate: 4-BFB (PID)	*0490553*	*4/20/99*	*4/21/99*	*50.0-150*		*87.9*	*%*	
SW-1 / S-4			**B904379-25**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	**48.1**	mg/kg dry	
Benzene	"	"	"		0.0500	**3.01**	"	
Toluene	"	"	"		0.0500	**5.44**	"	
Ethylbenzene	"	"	"		0.0500	**0.762**	"	
Xylenes (total)	"	"	"		0.100	**6.75**	"	
Surrogate: 4-BFB (FID)	*"*	*"*	*"*	*50.0-150*		*79.5*	*%*	
Surrogate: 4-BFB (PID)	*"*	*"*	*"*	*50.0-150*		*75.9*	*"*	
SW-1 / S-5			**B904379-26**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	**5.94**	mg/kg dry	
Benzene	"	"	"		0.0500	**0.268**	"	
Toluene	"	"	"		0.0500	**0.130**	"	
Ethylbenzene	"	"	"		0.0500	**0.0531**	"	
Xylenes (total)	"	"	"		0.100	**0.178**	"	
Surrogate: 4-BFB (FID)	*"*	*"*	*"*	*50.0-150*		*81.0*	*%*	
Surrogate: 4-BFB (PID)	*"*	*"*	*"*	*50.0-150*		*81.2*	*"*	
SW-1 / S-6			**B904379-27**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	**36.0**	mg/kg dry	
Benzene	"	"	"		0.0500	**0.829**	"	
Toluene	"	"	"		0.0500	**1.44**	"	
Ethylbenzene	"	"	"		0.0500	**0.474**	"	
Xylenes (total)	"	"	"		0.100	**3.58**	"	
Surrogate: 4-BFB (FID)	*"*	*"*	*"*	*50.0-150*		*85.5*	*%*	
Surrogate: 4-BFB (PID)	*"*	*"*	*"*	*50.0-150*		*75.3*	*"*	
SW-1 / S-7			**B904379-28**				**Soil**	
Gasoline Range Hydrocarbons	0490553	4/20/99	4/21/99		5.00	ND	mg/kg dry	
Benzene	"	"	"		0.0500	**0.0919**	"	
Toluene	"	"	"		0.0500	**0.158**	"	
Ethylbenzene	"	"	"		0.0500	ND	"	
Xylenes (total)	"	"	"		0.100	**0.278**	"	
Surrogate: 4-BFB (FID)	*"*	*"*	*"*	*50.0-150*		*76.3*	*%*	
Surrogate: 4-BFB (PID)	*"*	*"*	*"*	*50.0-150*		*80.7*	*"*	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled:	4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received:	4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	4/22/99 15:06

Dry Weight Determination
North Creek Analytical - Bothell

Sample Name	Lab ID	Matrix	Result	Units
MW-13 / S-2	B904379-02	Soil	86.4	%
MW-13 / S-3	B904379-03	Soil	74.8	%
MW-13 / S-4	B904379-04	Soil	73.3	%
MW-13 / S-5	B904379-05	Soil	74.6	%
MW-13 / S-6	B904379-06	Soil	76.2	%
MW-14 / S-3	B904379-10	Soil	76.2	%
MW-14 / S-4	B904379-11	Soil	76.7	%
MW-14 / S-5	B904379-12	Soil	76.0	%
MW-15 / S-4	B904379-16	Soil	77.6	%
MW-15 / S-5	B904379-17	Soil	76.9	%
MW-15 / S-6	B904379-18	Soil	78.3	%
SW-1 / S-2	B904379-23	Soil	77.5	%
SW-1 / S-3	B904379-24	Soil	76.6	%
SW-1 / S-4	B904379-25	Soil	76.1	%
SW-1 / S-5	B904379-26	Soil	77.5	%
SW-1 / S-6	B904379-27	Soil	74.3	%
SW-1 / S-7	B904379-28	Soil	79.6	%

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled: 4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received: 4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 4/22/99 15:06

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0490553	**Date Prepared: 4/20/99**					**Extraction Method: EPA 5030B (P/T)**				
Blank	**0490553-BLK1**									
Gasoline Range Hydrocarbons	4/21/99			**ND**	mg/kg dry	**5.00**				
Benzene	"			**ND**	"	**0.0500**				
Toluene	"			**ND**	"	**0.0500**				
Ethylbenzene	"			**ND**	"	**0.0500**				
Xylenes (total)	"			**ND**	"	**0.100**				
Surrogate: 4-BFB (FID)	"	*4.00*		*3.27*	"	*50.0-150*	*81.7*			
Surrogate: 4-BFB (PID)	"	*4.00*		*3.68*	"	*50.0-150*	*92.0*			
LCS	**0490553-BS1**									
Gasoline Range Hydrocarbons	4/21/99	25.0		22.4	mg/kg dry	70.0-130	89.6			
Surrogate: 4-BFB (FID)	"	*4.00*		*3.60*	"	*50.0-150*	*90.0*			
Duplicate	**0490553-DUP1**		**B904379-04**							
Gasoline Range Hydrocarbons	4/22/99		287	173	mg/kg dry			50.0	**49.6**	
Surrogate: 4-BFB (FID)	"	*5.46*		*7.01*	"	*50.0-150*	*128*			
Duplicate	**0490553-DUP2**		**B904379-24**							
Gasoline Range Hydrocarbons	4/21/99		314	360	mg/kg dry			50.0	**13.6**	
Surrogate: 4-BFB (FID)	"	*5.22*		*5.92*	"	*50.0-150*	*113*			
Matrix Spike	**0490553-MS1**		**B904379-02**							
Benzene	4/21/99	0.579	ND	0.534	mg/kg dry	60.0-140	**92.2**			
Toluene	"	0.579	0.0518	0.553	"	60.0-140	**86.6**			
Ethylbenzene	"	0.579	ND	0.541	"	60.0-140	**93.4**			
Xylenes (total)	"	1.74	ND	1.60	"	60.0-140	**92.0**			
Surrogate: 4-BFB (PID)	"	*4.63*		*3.80*	"	*50.0-150*	*82.1*			
Matrix Spike Dup	**0490553-MSD1**		**B904379-02**							
Benzene	4/21/99	0.579	ND	0.542	mg/kg dry	60.0-140	**93.6**	20.0	**1.51**	
Toluene	"	0.579	0.0518	0.557	"	60.0-140	**87.3**	20.0	**0.805**	
Ethylbenzene	"	0.579	ND	0.543	"	60.0-140	**93.8**	20.0	**0.427**	
Xylenes (total)	"	1.74	ND	1.60	"	60.0-140	**92.0**	20.0	**0**	
Surrogate: 4-BFB (PID)	"	*4.63*		*3.73*	"	*50.0-150*	*80.6*			

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil #01-068	Sampled:	4/13/99 to 4/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808	Received:	4/19/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	4/22/99 15:06

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

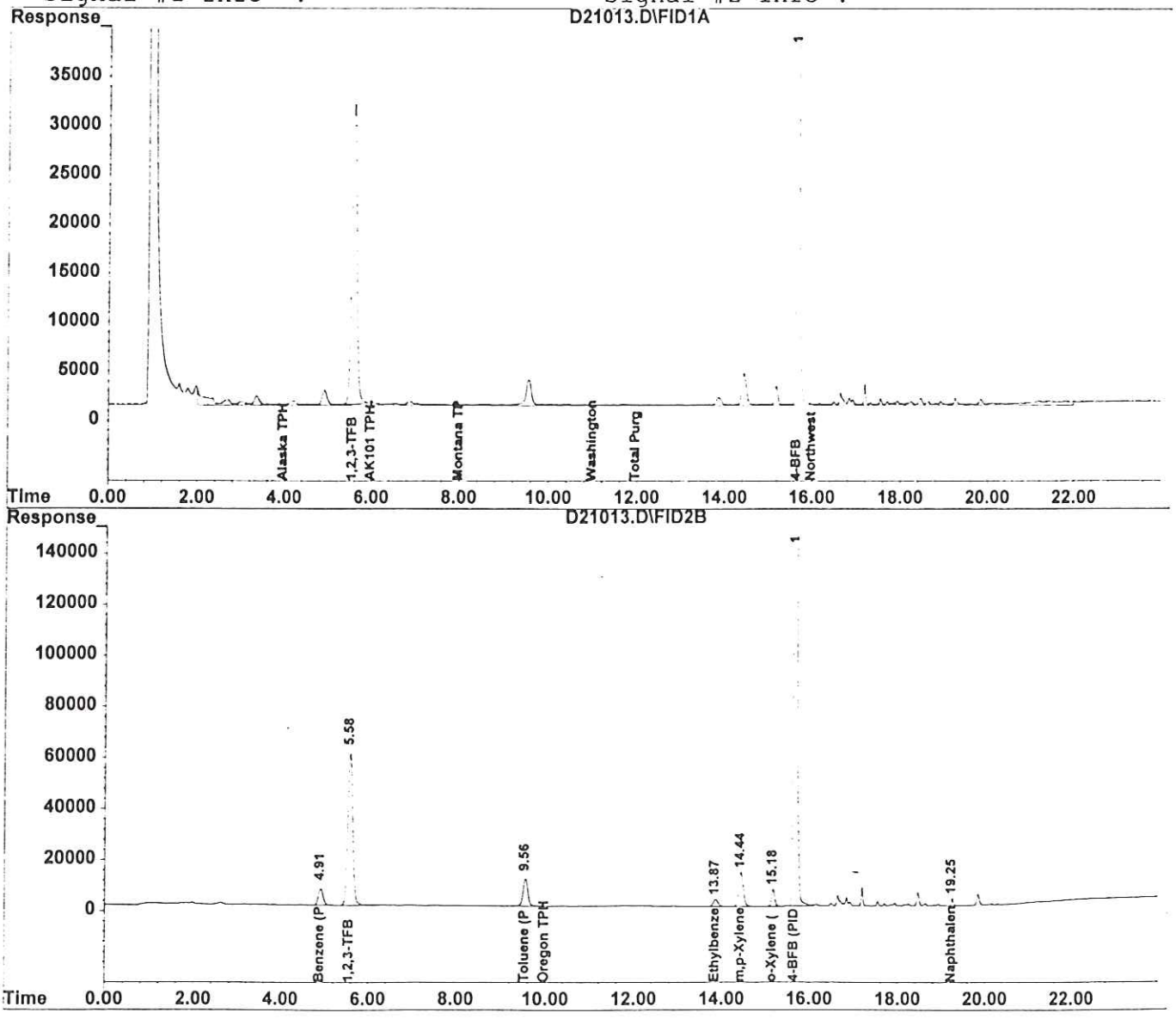
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21013.D\FID1A.CH Vial: 13
Acq On : 21 Apr 1999 1:28 pm Operator: ng
Sample : b904379-28 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21013.D\FID2B.CH Vial: 13
Acq On : 21 Apr 99 1:28 pm Operator: ng
Sample : b904379-28 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 13:53 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



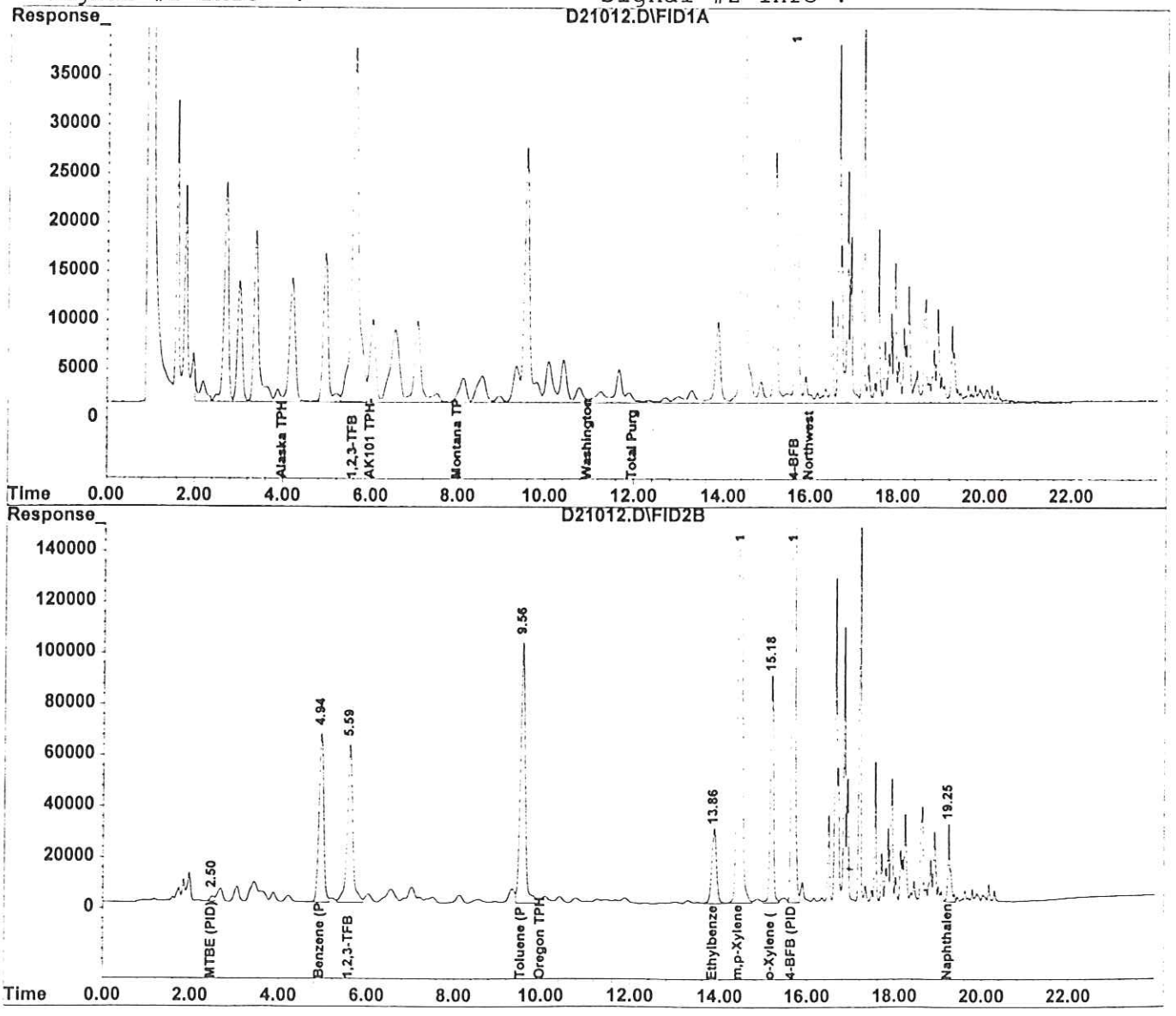
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21012.D\FID1A.CH Vial: 12
Acq On : 21 Apr 1999 12:58 pm Operator: ng
Sample : b904379-27 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21012.D\FID2B.CH Vial: 12
Acq On : 21 Apr 99 12:58 pm Operator: ng
Sample : b904379-27 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 13:22 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



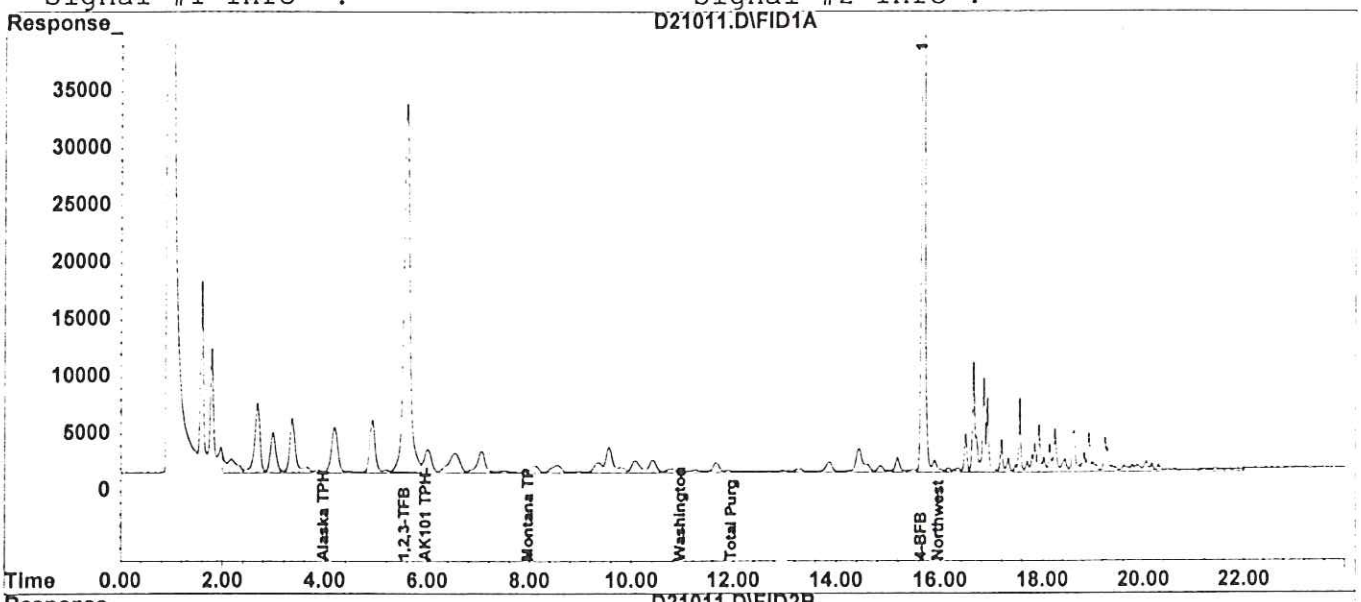
Quantitation Report

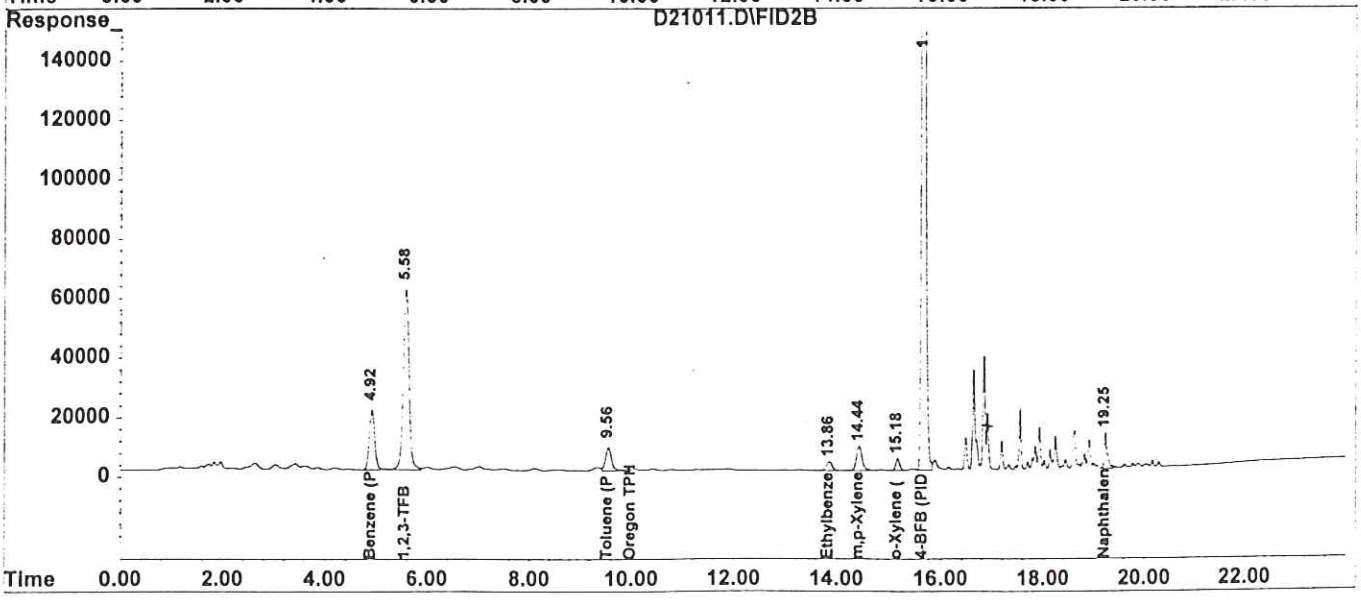
Data File : D:\HPCHEM\2\DATA\042199\D21011.D\FID1A.CH Vial: 11
Acq On : 21 Apr 1999 12:28 pm Operator: ng
Sample : b904379-26 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21011.D\FID2B.CH Vial: 11
Acq On : 21 Apr 99 12:28 pm Operator: ng
Sample : b904379-26 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 12:52 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





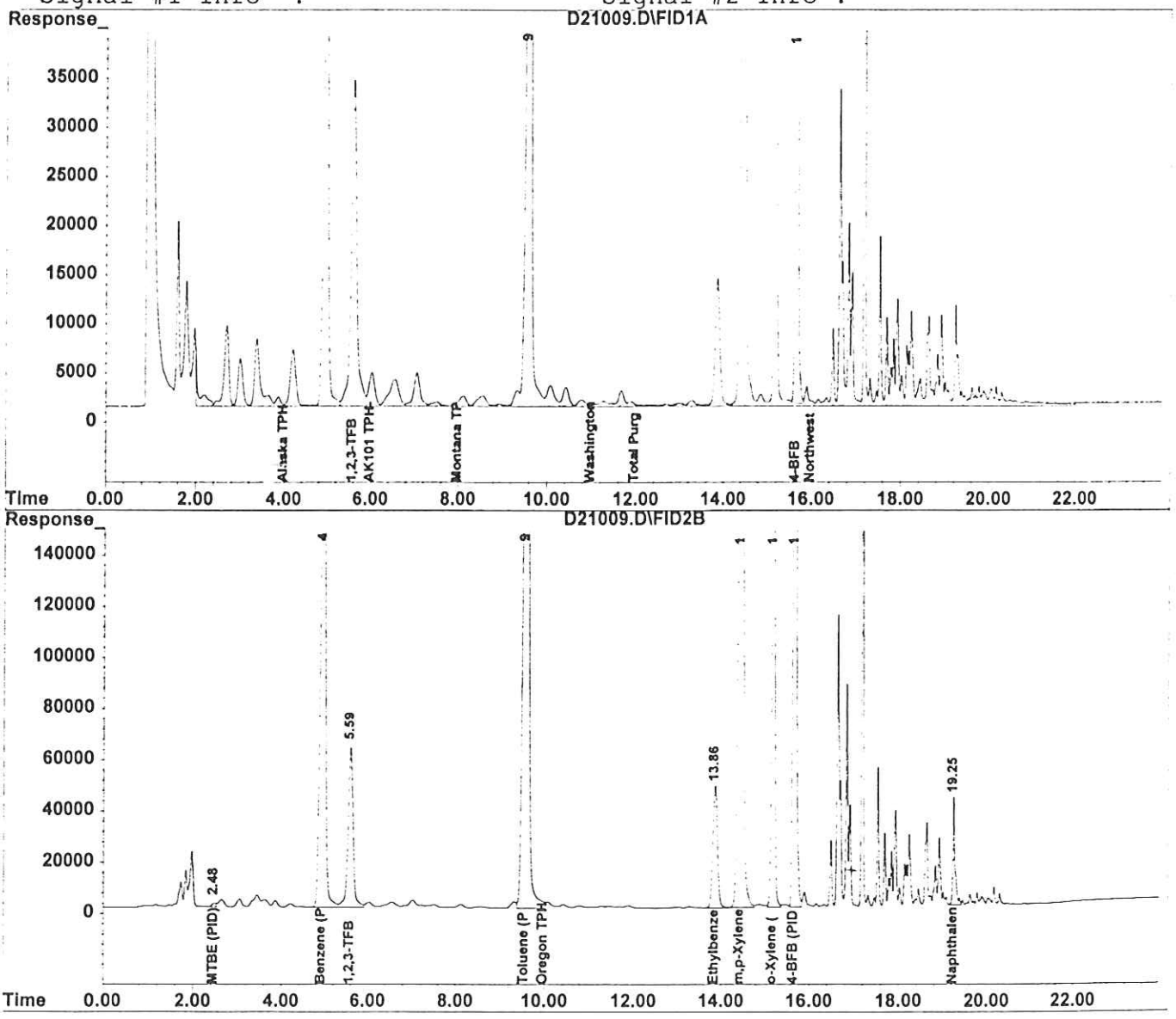
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21009.D\FID1A.CH Vial: 9
Acq On : 21 Apr 1999 11:28 am Operator: ng
Sample : b904379-25 Inst : GC #3
Misc : 100 uL Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21009.D\FID2B.CH Vial: 9
Acq On : 21 Apr 99 11:28 am Operator: ng
Sample : b904379-25 Inst : GC #3
Misc : 100 uL Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 11:52 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



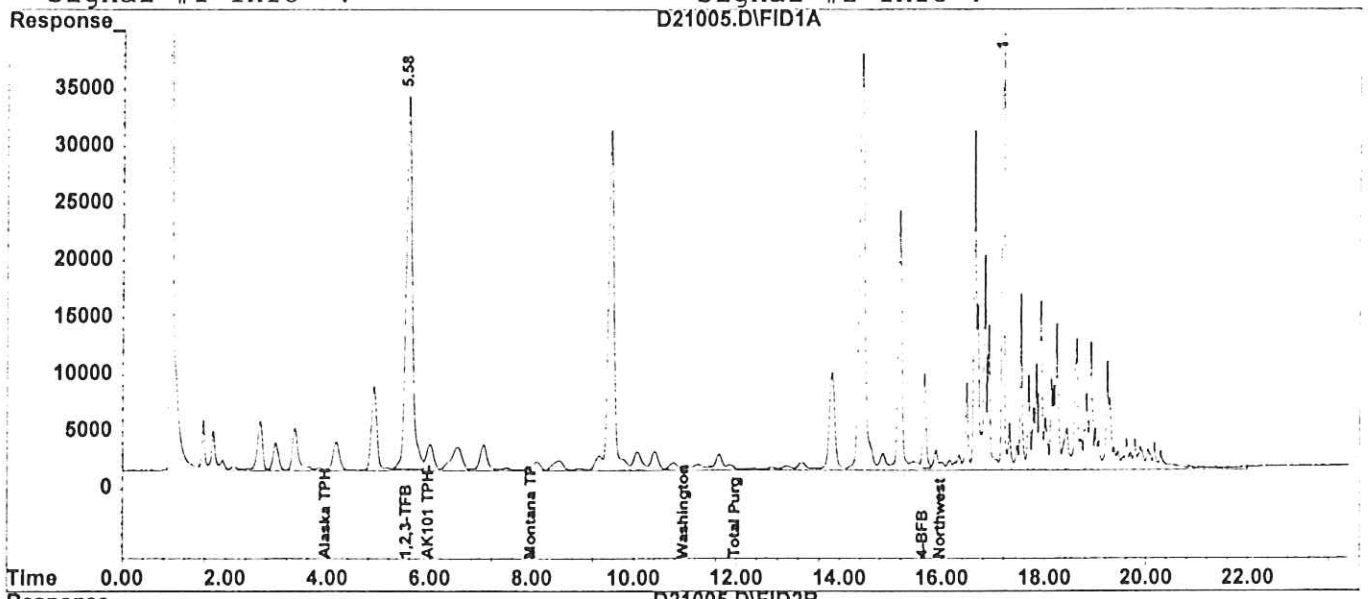
Quantitation Report

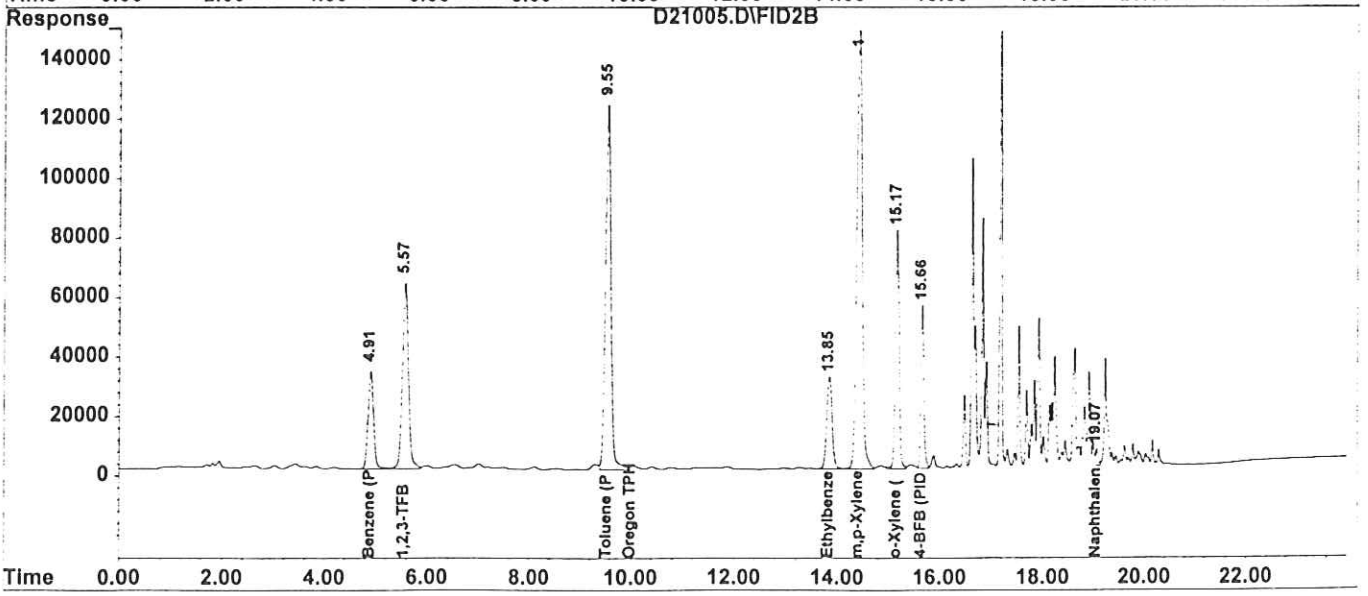
Data File : D:\HPCHEM\2\DATA\042199\D21005.D\FID1A.CH Vial: 5
Acq On : 21 Apr 1999 9:28 am Operator: ng
Sample : b904379-24 r1 Inst : GC #3
Misc : 10 uL Multiplr: 10.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21005.D\FID2B.CH Vial: 5
Acq On : 21 Apr 99 9:28 am Operator: ng
Sample : b904379-24 r1 Inst : GC #3
Misc : 10 uL Multiplr: 10.00
IntFile : SURR2.E
Quant Time: Apr 21 9:52 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





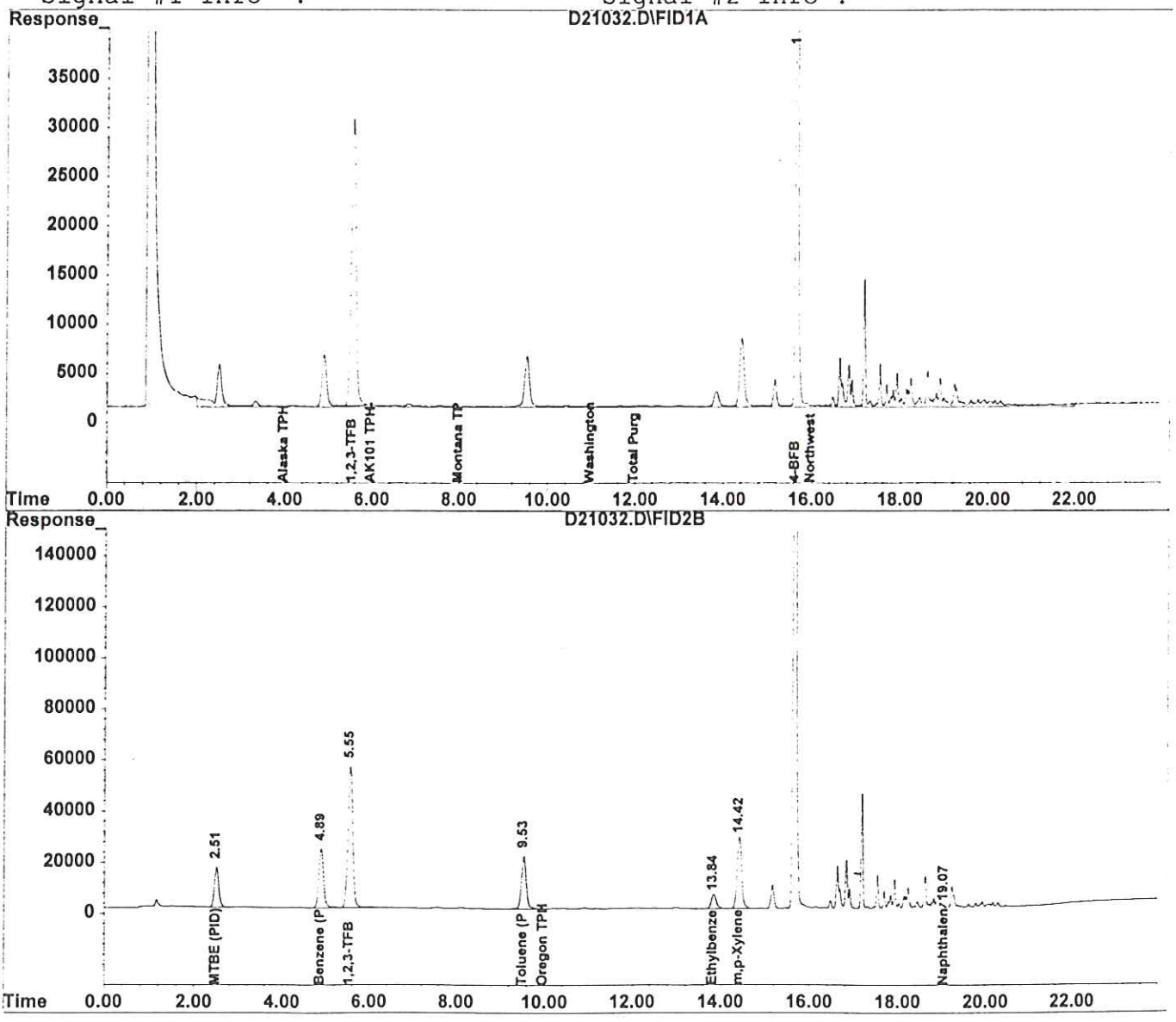
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21032.D\FID1A.CH Vial: 32
Acq On : 21 Apr 1999 11:01 pm Operator: ng
Sample : b904379-23 r2 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21032.D\FID2B.CH Vial: 32
Acq On : 21 Apr 99 11:01 pm Operator: ng
Sample : b904379-23 r2 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 22 6:50 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



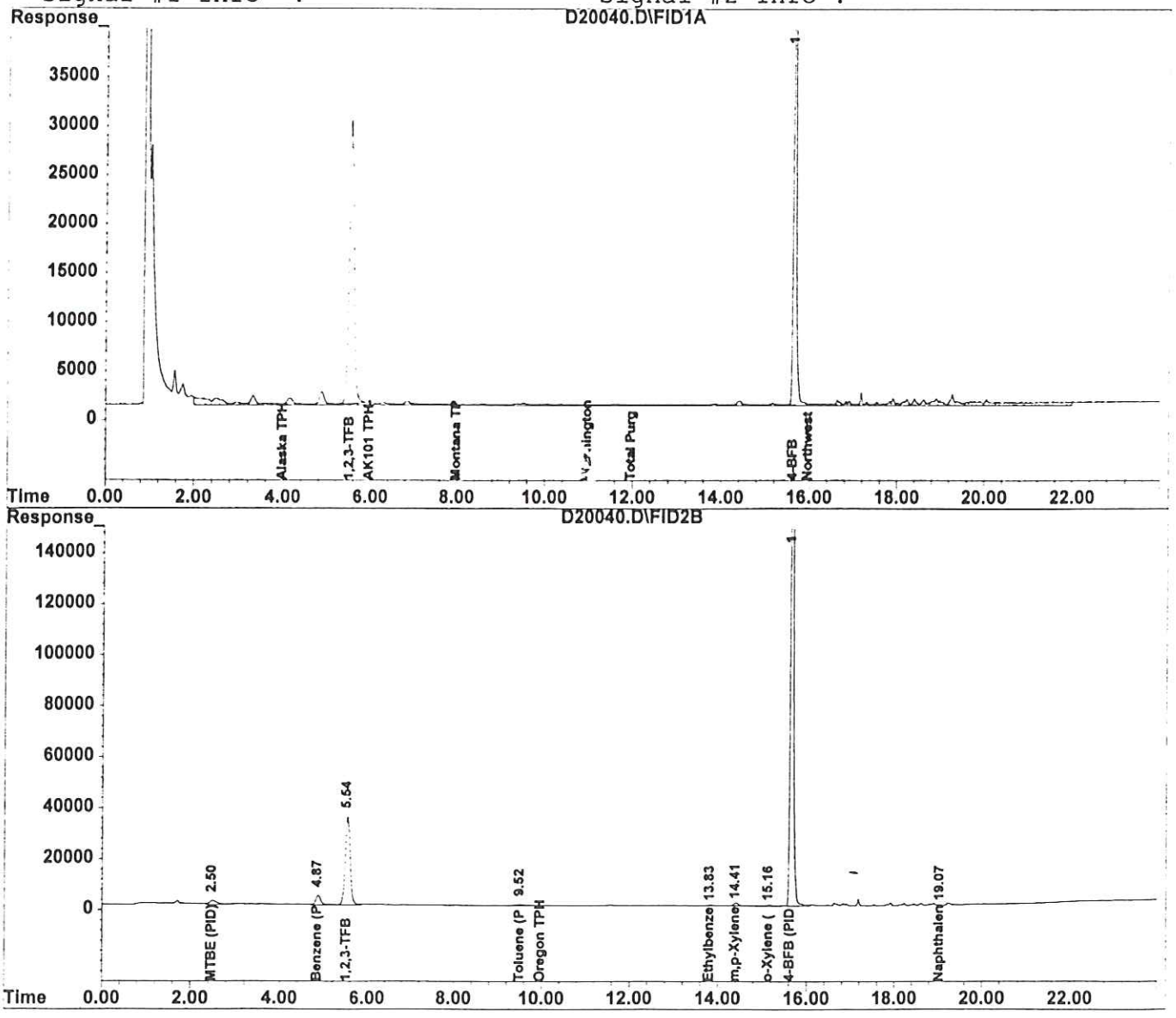
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042099\D20040.D\FID1A.CH Vial: 40
Acq On : 21 Apr 1999 2:04 am Operator: ng
Sample : B904379-18 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042099\D20040.D\FID2B.CH Vial: 40
Acq On : 21 Apr 99 2:04 am Operator: ng
Sample : B904379-18 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 2:28 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Tue Apr 20 07:45:07 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



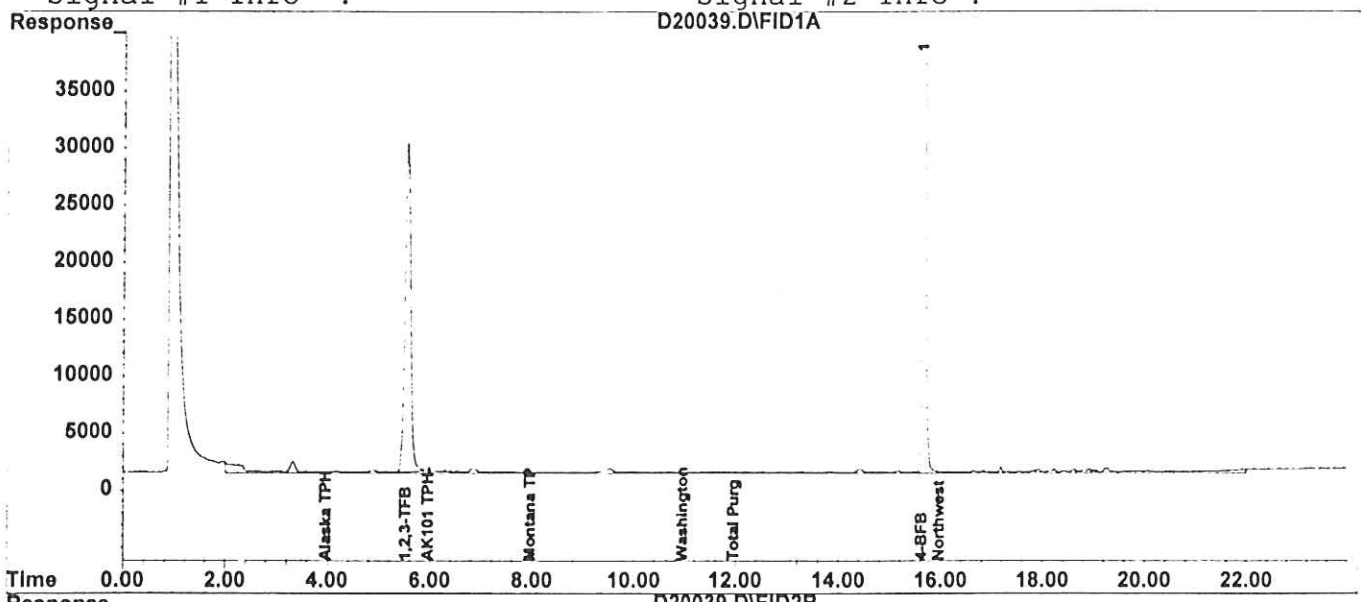
Quantitation Report

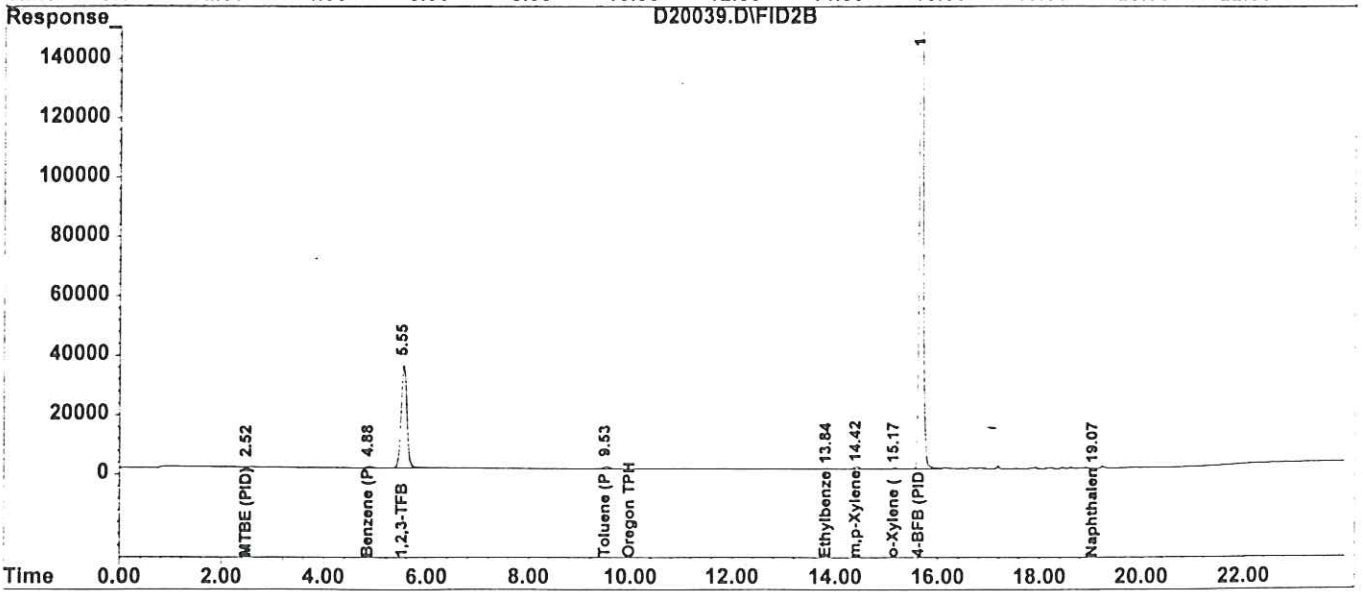
Data File : D:\HPCHEM\2\DATA\042099\D20039.D\FID1A.CH Vial: 39
Acq On : 21 Apr 1999 1:35 am Operator: ng
Sample : B904379-17 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042099\D20039.D\FID2B.CH Vial: 39
Acq On : 21 Apr 99 1:35 am Operator: ng
Sample : B904379-17 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 1:59 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Tue Apr 20 07:45:07 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





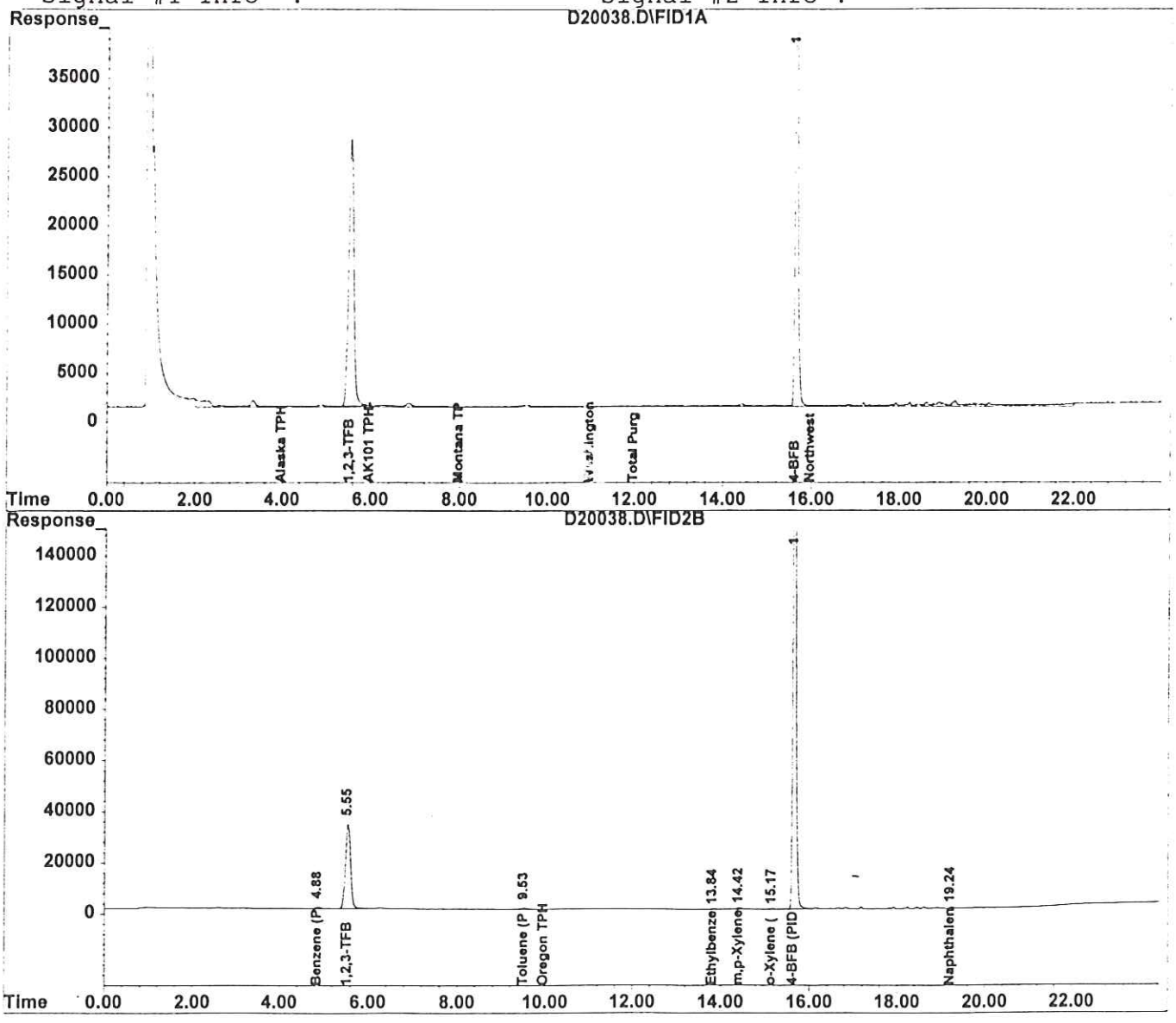
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042099\D20038.D\FID1A.CH Vial: 38
Acq On : 21 Apr 1999 1:05 am Operator: ng
Sample : B904379-16 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042099\D20038.D\FID2B.CH Vial: 38
Acq On : 21 Apr 99 1:05 am Operator: ng
Sample : B904379-16 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 1:30 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Tue Apr 20 07:45:07 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



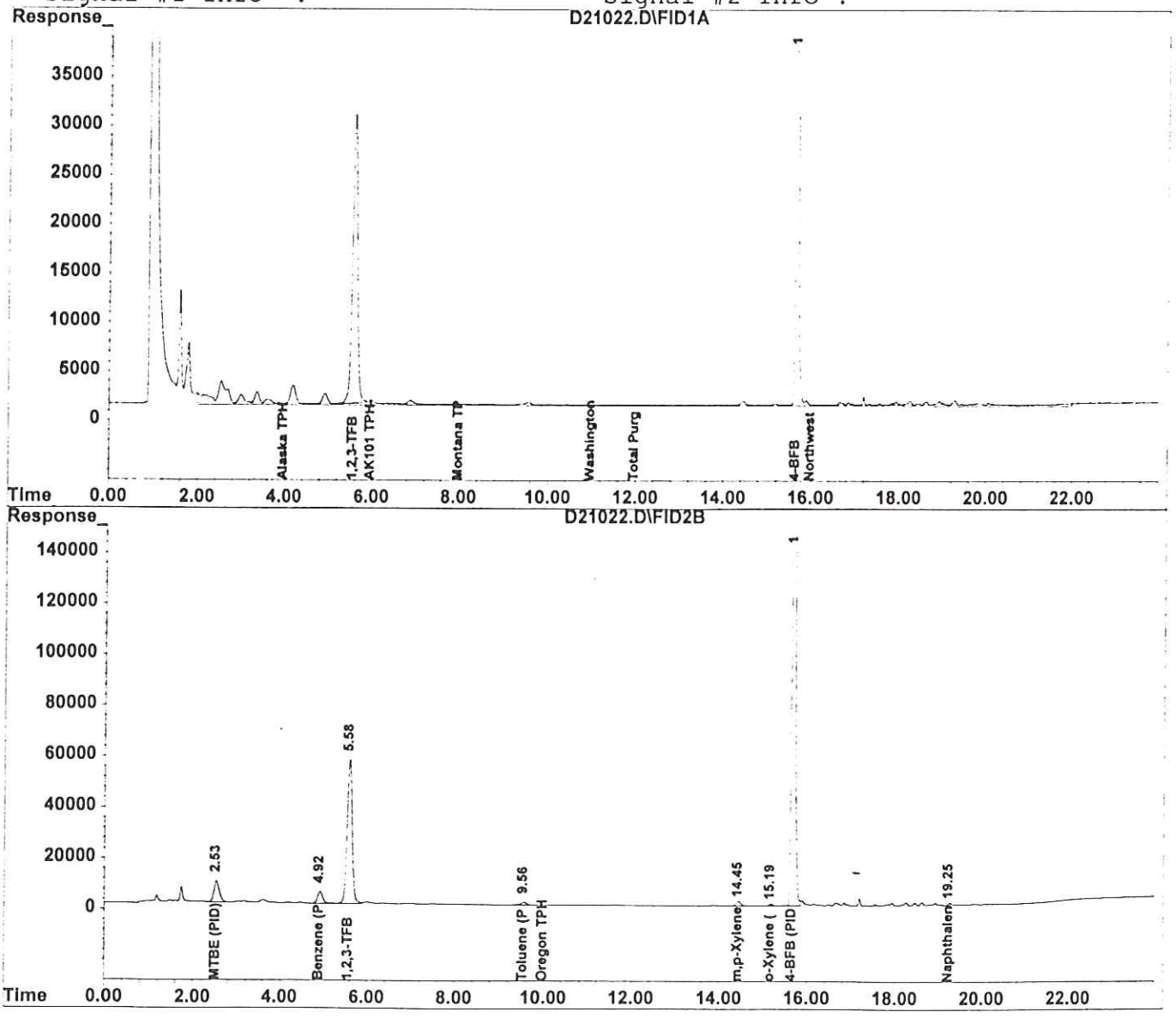
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21022.D\FID1A.CH Vial: 22
Acq On : 21 Apr 1999 6:02 pm Operator: ng
Sample : b904379-12 r1 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21022.D\FID2B.CH Vial: 22
Acq On : 21 Apr 99 6:02 pm Operator: ng
Sample : b904379-12 r1 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 18:26 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



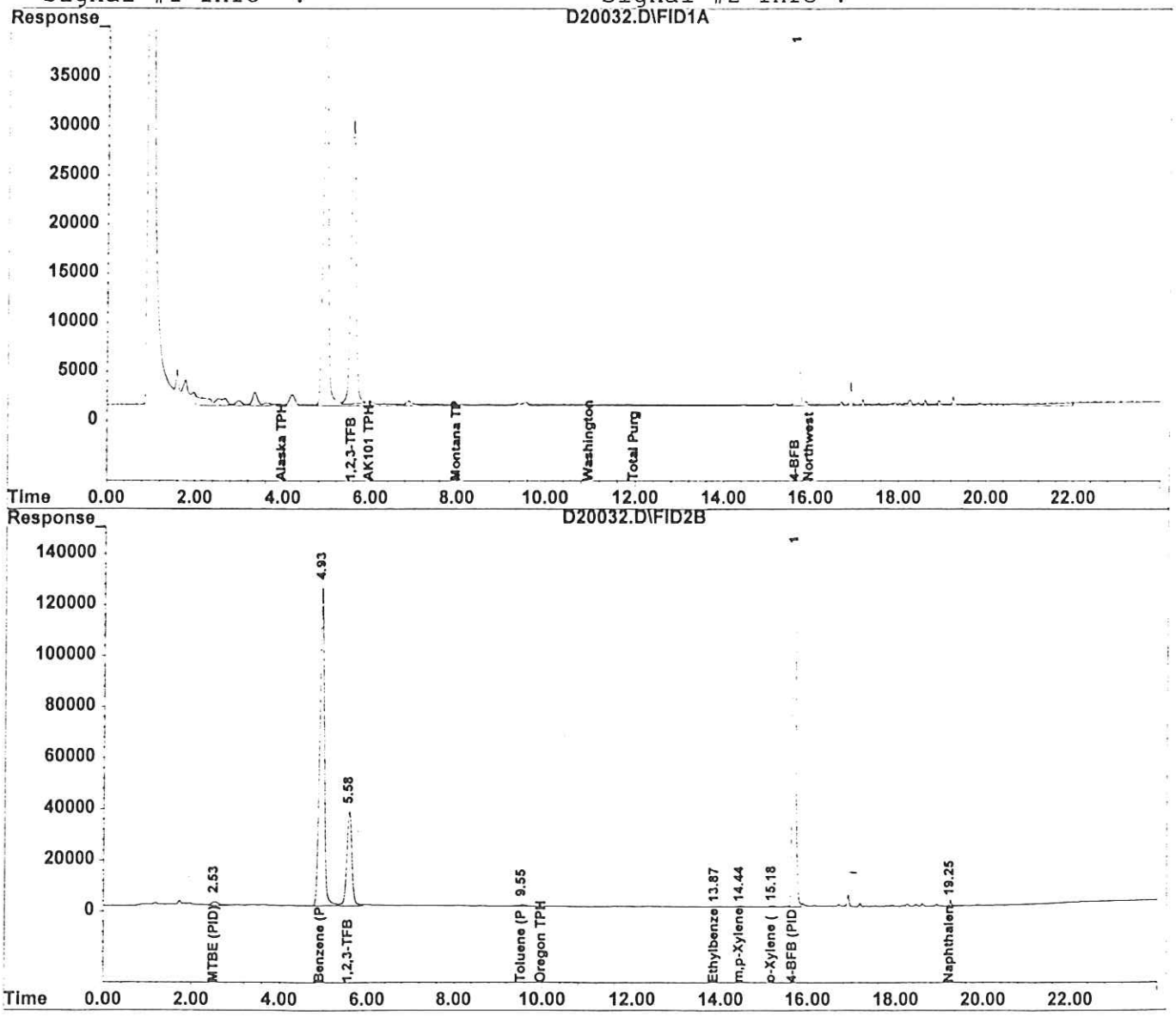
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042099\D20032.D\FID1A.CH Vial: 32
Acq On : 20 Apr 1999 10:07 pm Operator: ng
Sample : B904379-11 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042099\D20032.D\FID2B.CH Vial: 32
Acq On : 20 Apr 99 10:07 pm Operator: ng
Sample : B904379-11 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 20 22:32 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Tue Apr 20 07:45:07 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



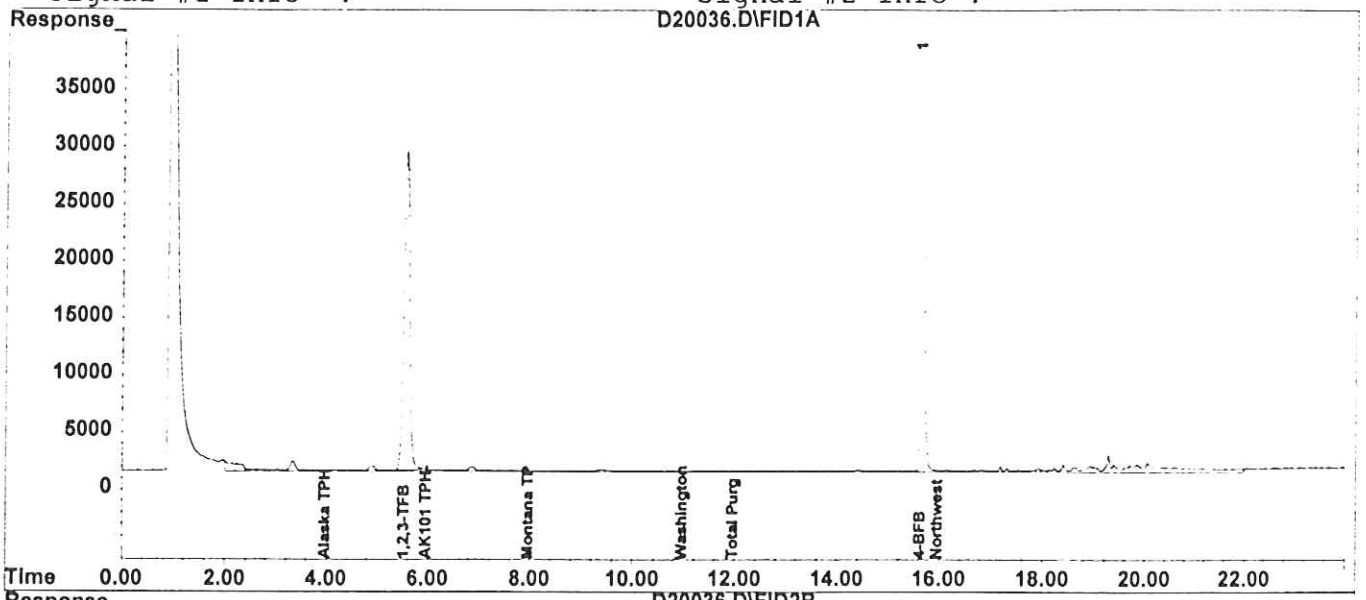
Quantitation Report

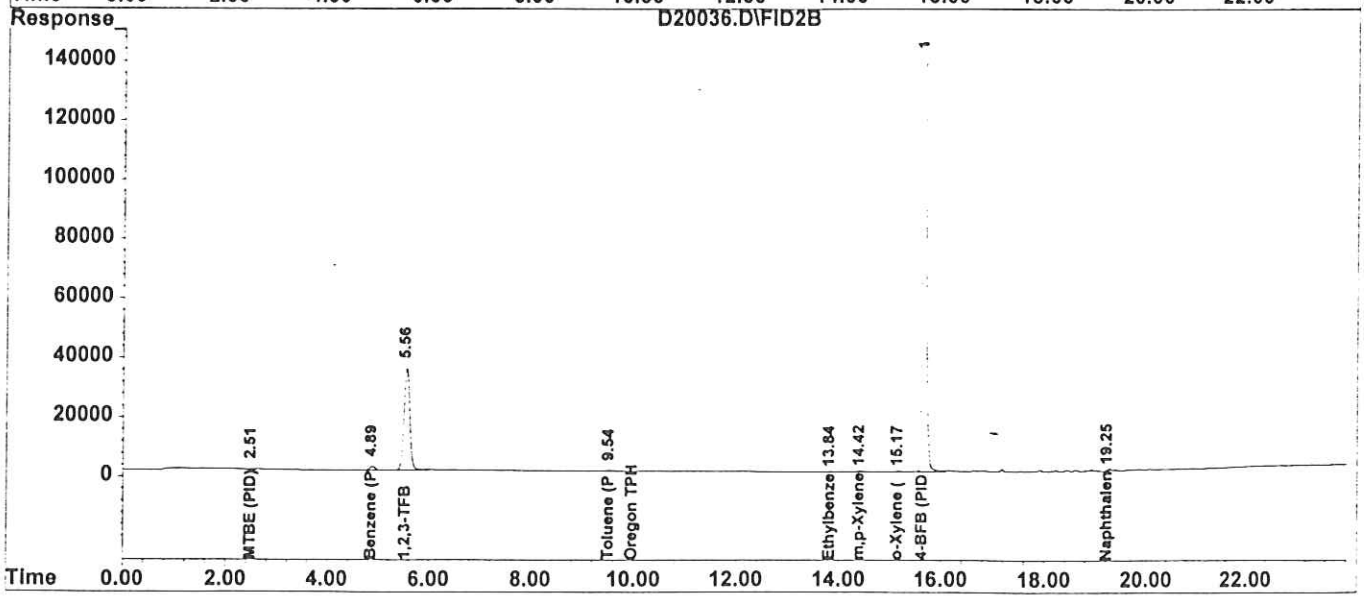
Data File : D:\HPCHEM\2\DATA\042099\D20036.D\FID1A.CH Vial: 36
Acq On : 21 Apr 1999 12:06 am Operator: ng
Sample : B904379-10 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042099\D20036.D\FID2B.CH Vial: 36
Acq On : 21 Apr 99 12:06 am Operator: ng
Sample : B904379-10 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 0:31 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Tue Apr 20 07:45:07 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





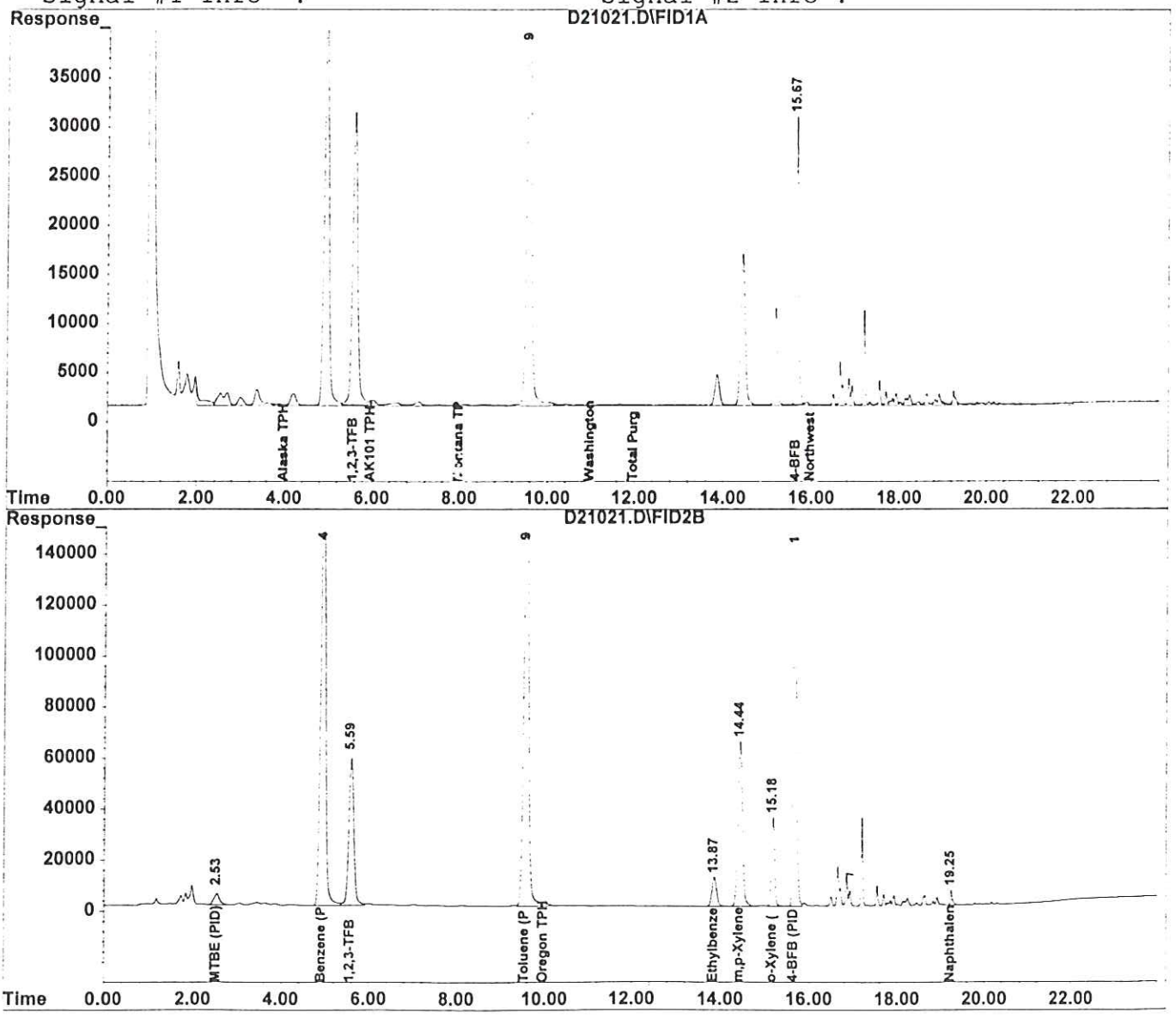
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21021.D\FID1A.CH Vial: 21
Acq On : 21 Apr 1999 5:31 pm Operator: ng
Sample : b904379-06 r1 Inst : GC #3
Misc : 50 ul Multiplr: 2.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21021.D\FID2B.CH Vial: 21
Acq On : 21 Apr 99 5:31 pm Operator: ng
Sample : b904379-06 r1 Inst : GC #3
Misc : 50 ul Multiplr: 2.00
IntFile : SURR2.E
Quant Time: Apr 21 17:55 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



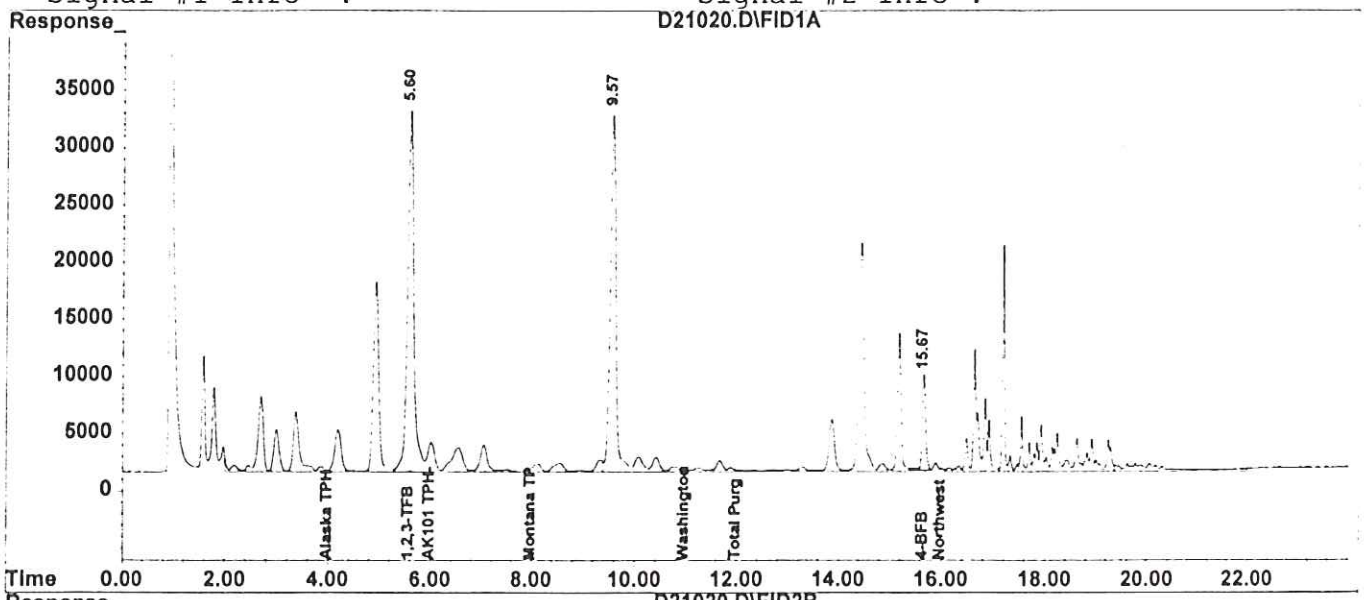
Quantitation Report

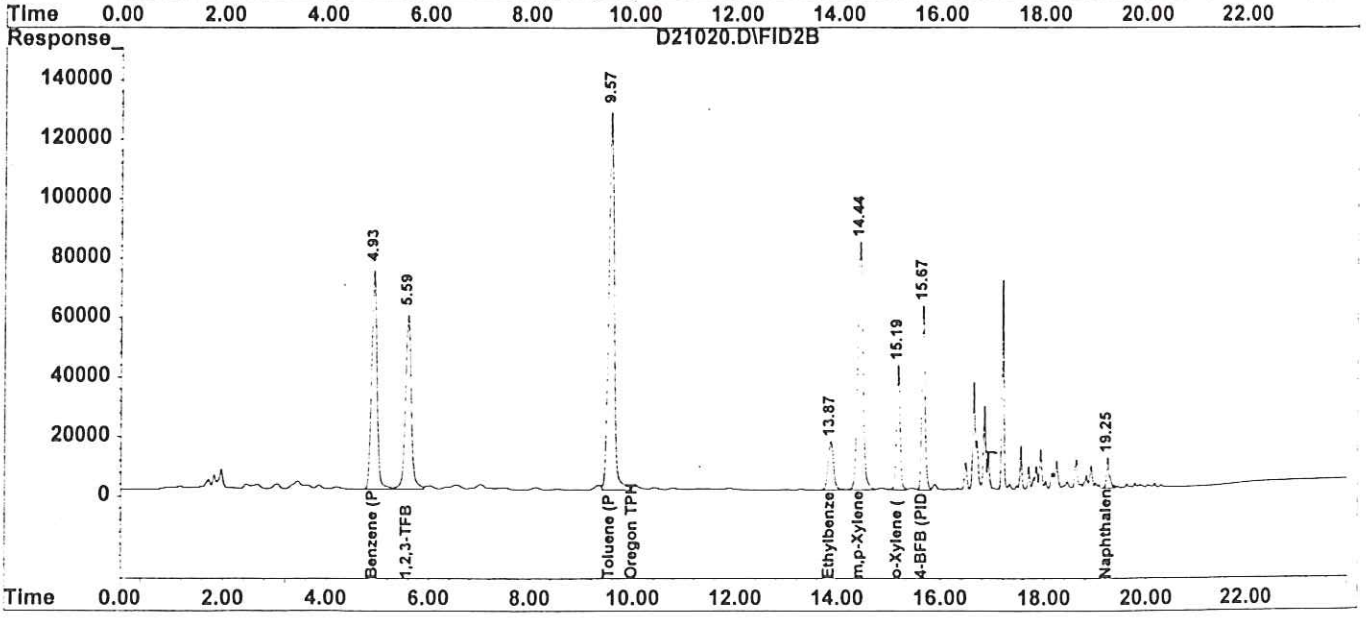
Data File : D:\HPCHEM\2\DATA\042199\D21020.D\FID1A.CH Vial: 20
Acq On : 21 Apr 1999 5:01 pm Operator: ng
Sample : b904379-05 r1 Inst : GC #3
Misc : 10 ul Multiplr: 10.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21020.D\FID2B.CH Vial: 20
Acq On : 21 Apr 99 5:01 pm Operator: ng
Sample : b904379-05 r1 Inst : GC #3
Misc : 10 ul Multiplr: 10.00
IntFile : SURR2.E
Quant Time: Apr 21 17:25 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :





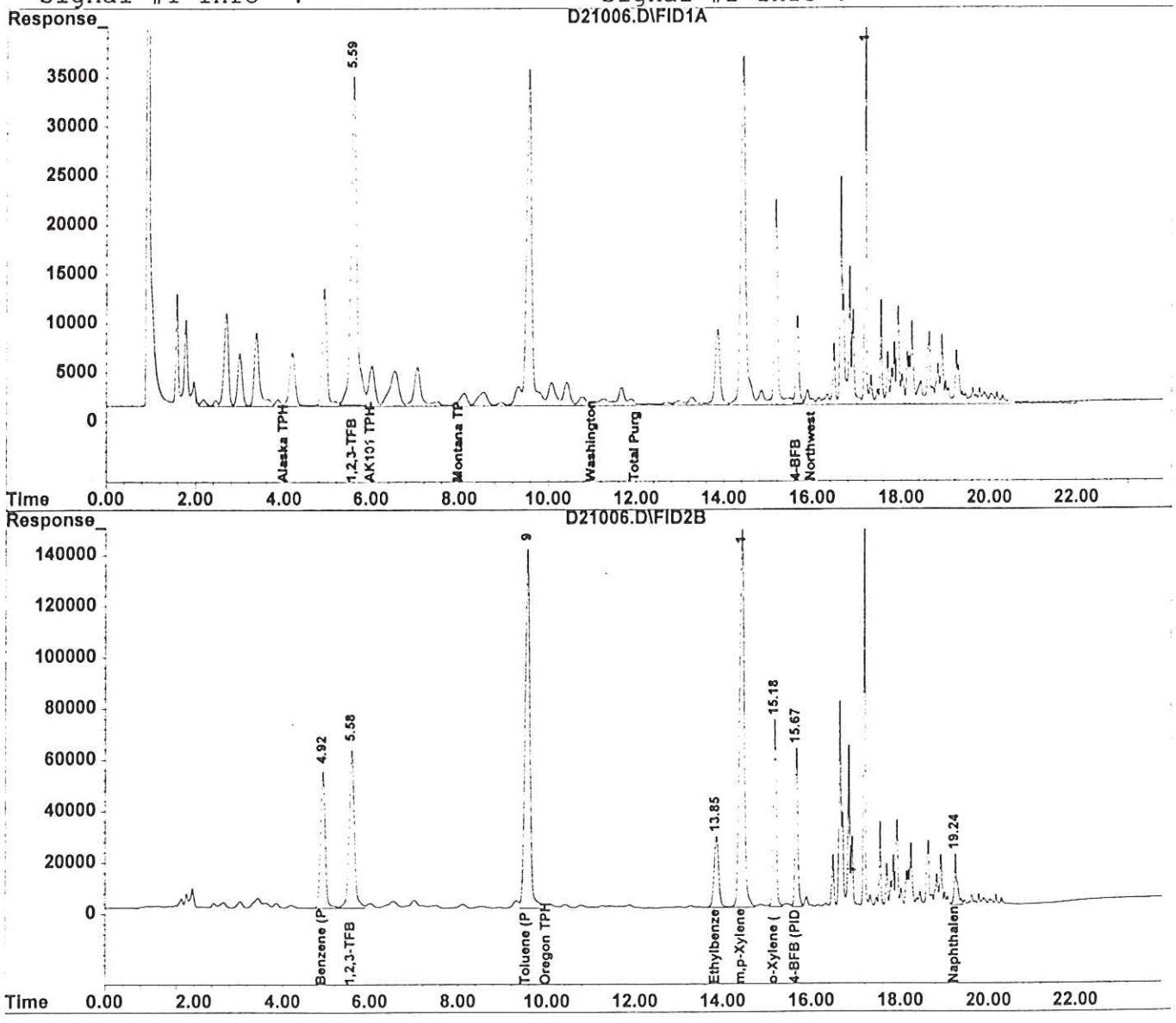
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21006.D\FID1A.CH Vial: 6
Acq On : 21 Apr 1999 9:58 am Operator: ng
Sample : b904379-04 r1 Inst : GC #3
Misc : 10 uL Multiplr: 10.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21006.D\FID2B.CH Vial: 6
Acq On : 21 Apr 99 9:58 am Operator: ng
Sample : b904379-04 r1 Inst : GC #3
Misc : 10 uL Multiplr: 10.00
IntFile : SURR2.E
Quant Time: Apr 21 10:22 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



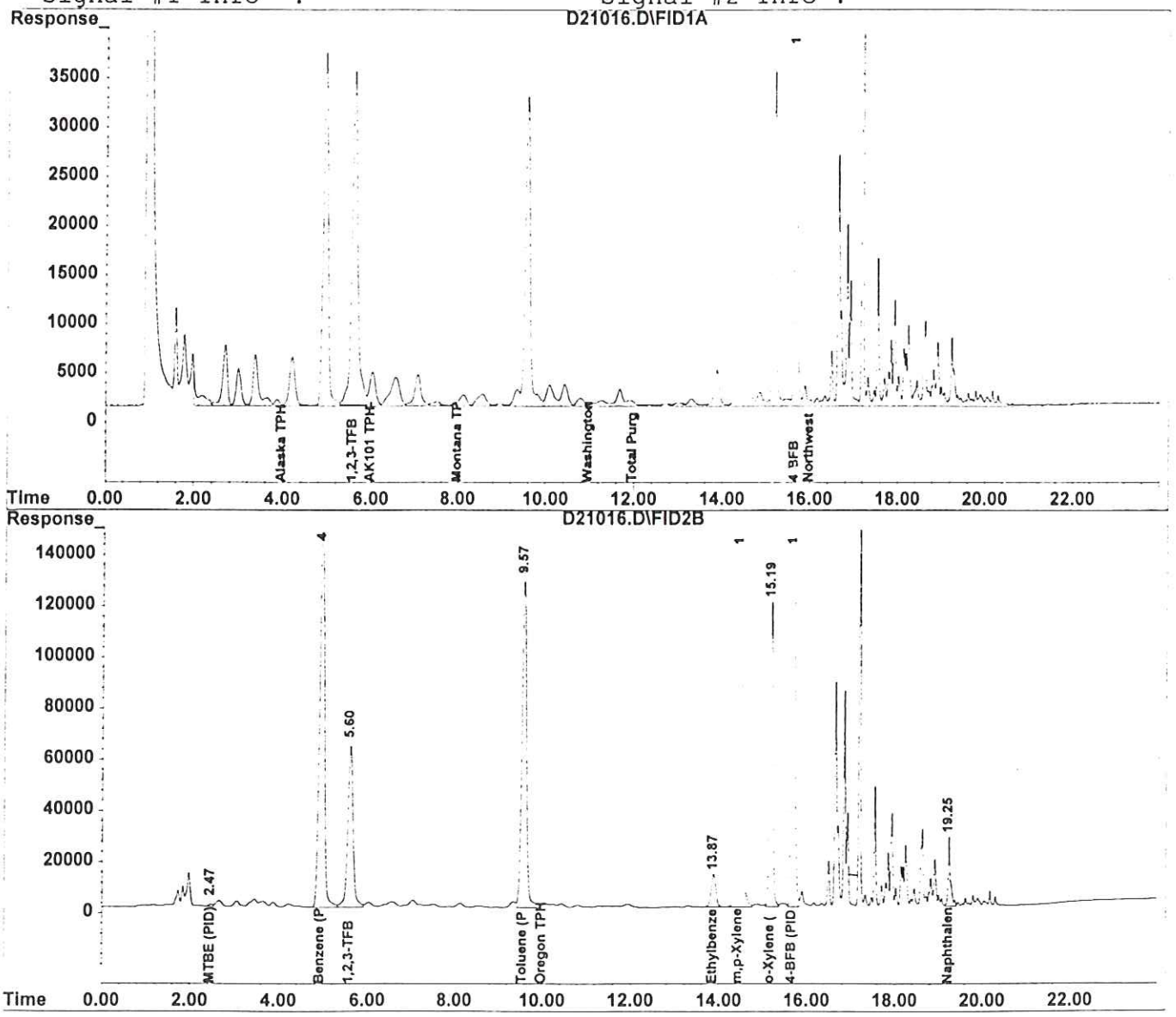
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042199\D21016.D\FID1A.CH Vial: 16
Acq On : 21 Apr 1999 2:59 pm Operator: ng
Sample : b904379-03 r1 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042199\D21016.D\FID2B.CH Vial: 16
Acq On : 21 Apr 99 2:59 pm Operator: ng
Sample : b904379-03 r1 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 21 15:24 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Wed Apr 21 08:00:36 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



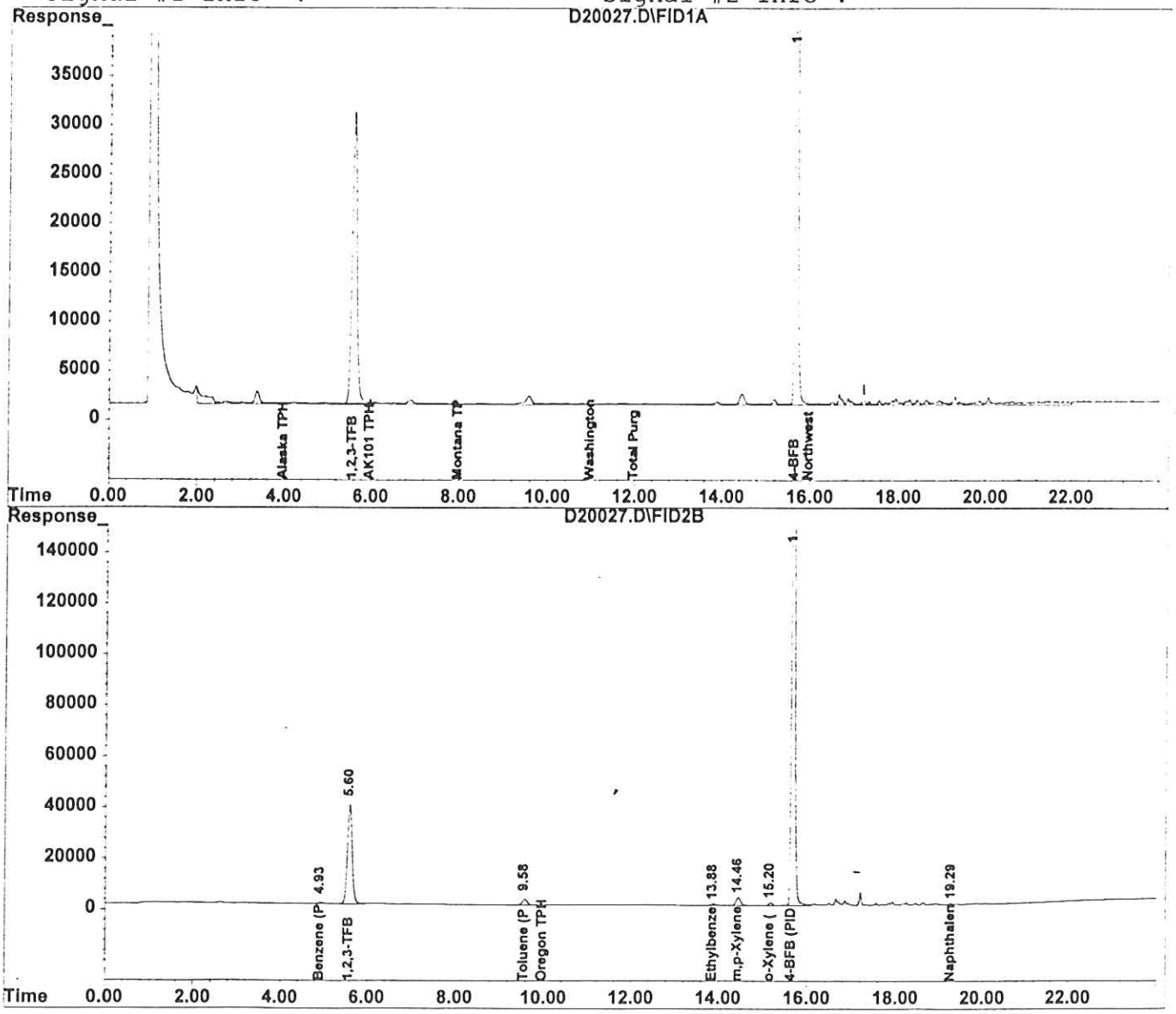
Quantitation Report

Data File : D:\HPCHEM\2\DATA\042099\D20027.D\FID1A.CH Vial: 27
Acq On : 20 Apr 1999 7:38 pm Operator: ng
Sample : B904379-02 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR.E

Data File : D:\HPCHEM\2\DATA\042099\D20027.D\FID2B.CH Vial: 27
Acq On : 20 Apr 99 7:38 pm Operator: ng
Sample : B904379-02 Inst : GC #3
Misc : 100 ul Multiplr: 1.00
IntFile : SURR2.E
Quant Time: Apr 20 20:02 1999 Quant Results File: TPHG0499.RES

Quant Method : D:\HPCHEM\2\METHODS\TPHG0499.M (Chemstation Integrator)
Title : DB-MTBE Method
Last Update : Tue Apr 20 07:45:07 1999
Response via : Multiple Level Calibration
DataAcq Meth : TPHG0499.M

Volume Inj. :
Signal #1 Phase : Signal #2 Phase:
Signal #1 Info : Signal #2 Info :



NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (206) 481-9200 FAX 485-2992
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 643-9200 FAX 644-2202

CHAIN OF CUSTODY REPORT

Work Order #

REPORT TO:	INVOICE TO:
ATTENTION: Eric Poltzin/Maxim	ATTENTION: Scott Sloan/Time Oil
ADDRESS: 10220 N Nevada, Suite 290 Spokane Wa 99218	ADDRESS: 2737 West Commodore Wy Seattle Wa 98199
PHONE: 509-465-2188 FAX: 509-465-2199	P.O. NUMBER: NCA QUOTE #:
PROJECT NAME: Sunnyside Time Oil #01-068	
PROJECT NUMBER: 99-04808	
SAMPLED BY: ERIC POLTZIN	

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: HOLD	WTPH-G	BTEX	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1. MW-13/S-1	4-13-99/0935	01	X			S	1	
2. MW-13/S-2	4-13-99/0950	02	X	X	X			
3. MW-13/S-3	4-13-99/1000	03	X	X	X			
4. MW-13/S-4	4-13-99/1010	04	X	X	X			
5. MW-13/S-5	4-13-99/1020	05	X	X	X			
6. MW-13/S-6	4-13-99/1030	06	X	X	X			
7. MW-13/S-7	4-13-99/1040	07	X					
8. MW-14/S-1	4-13-99/1300	08	X					
9. MW-14/S-2	4-13-99/1310	09	X					
10. MW-14/S-3	4-13-99/1325	10	X	X	X			

RELINQUISHED BY: Eric Poltzin	DATE: 4-15-99	RECEIVED BY:	DATE:
PRINT NAME: ERIC J POLTZIN	FIRM: Maxim TIME: 1550	PRINT NAME: Fed Ex	FIRM: TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
PRINT NAME:	FIRM: TIME:	PRINT NAME:	FIRM: TIME:

ADDITIONAL REMARKS: Bill Time Oil

PAGE 1 OF 1

04/20/1999 10:05 509-465-2199 MAXIM TECH PAGE 02

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 420-9200 FAX 420-9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210

CHAIN OF CUSTODY REPORT

Work Order #

04/20/1999 10:05 509-465-2199 MAXIM TECH PAGE 03

REPORT TO:	INVOICE TO:
ATTENTION: ERIC POLZIN / Maxim	ATTENTION: Scott Shaw / Time Oil
ADDRESS: 10220 N Nevada Suite 290 Spokane Wa 99218	ADDRESS: 2737 W. Commodore Way Seattle Wa 98199
PHONE: 509-465-2188 FAX: 509-465-2199	P.O. NUMBER: NCA QUOTE #:
PROJECT NAME: Sunny Side Time #01-0168	
PROJECT NUMBER: 99-04808	
SAMPLED BY: ERIC POLZIN	

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 (Standard) | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 (Standard) | 3-4 | 2 | 1 | Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: HOLD	WTPH-G	BTEX	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW-14/S-4	4-13-99 1340	11	X	X	X	S	1	
2.	MW-14/S-5	4-13-99 1350	12	X	X	X			
3.	MW-15/S-1	4-13-99 1510	13	X					
4.	MW-15/S-2	4-13-99 1520	14	X					
5.	MW-15/S-3	4-13-99 1530	15	X					
6.	MW-15/S-4	4-13-99 1540	16	X	X	X			
7.	MW-15/S-5	4-13-99 1550	17	X	X	X			
8.	MW-15/S-6	4-13-99 1601	18	X	X	X			
9.	MW-15/S-7	4-13-99 1610	19	X					
10.	MW-16/S-1	4-14-99 1520	20	X					

RELINQUISHED BY:		DATE: 4-15-99	RECEIVED BY:		DATE:
PRINT NAME: ERIC J POLZIN	FIRM: Maxim	TIME: 1550	PRINT NAME: FED EX	FIRM:	TIME:
RELINQUISHED BY:		DATE:	RECEIVED BY:		DATE:
PRINT NAME:	FIRM:	TIME:	PRINT NAME:	FIRM:	TIME:

ADDITIONAL REMARKS:

CHAIN OF CUSTODY RECORD

MAXIM TECHNOLOGIES INC

600 South 25th Street
Billings, Montana 59101
Phone (406) 248-9161 • Fax (406) 248-9282

Sunnyside Time Oil - #01-068
Project or Site Name

99-04808
Project Number

Eric Polzin
Sampler Name (Printed)

Eric Polzin
Contact Name

Maxim
Report to (Firm or Agency)

10220 N. Nevada Suite 290
Address Spokane, WA 99218

Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED: Hold							NOTES	LAB NUMBER
						Hold		VPHG	BTEX					
4-14-99	1530	mw-16/S-2		S	1	X								21
4-14-99	1055	SW-1/S1				X								22
4-14-99	1100	SW-1/S-2				X		X	X					23
4-14-99	1110	SW-1/S-3				X		X	X					24
4-14-99	1120	SW-1/S-4				X		X	X					25
4-14-99	1130	SW-1/S-5				X		X	X					26
4-14-99	1140	SW-1/S-6				X		X	X					27
4-14-99	1150	SW-1/S-7				X		X	X					28
4-14-99	1205	SW-1/S-8				X								29
4-14-99	1230	SW-1/S-9				X								30

	Date	Time	Received by:
Relinquished by: Eric Polzin	4-15-99	1550	Fed Ex
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Remarks: Invoice to: Scott Sloan/Time Oil
2737 West Commadore Wy
Seattle, WA 98199

short 3 of 4

04/20/1999 10:05 509-465-2199 MAXIM TECH PAGE 04

CHAIN OF CUSTODY RECORD

MAXIM TECHNOLOGIES INC

600 South 25th Street
Billings, Montana 59101
Phone (406) 248-9161 • Fax (406) 248-9282

Sunnyside Tri-Cities #01-068
Project or Site Name

99-041808
Project Number

Eric J Polzin
Sampler Name (Printed)

Eric J Polzin
Contact Name

Maxim
Report to (Firm or Agency)

10220 N Nevada, Suite 290
Address Spokane Wa 99218

Eric J Polzin
Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED: HOLD							NOTES	LAB NUMBER
4-14-99	1250	SW-1/S-10		S	1	X								31

	Date	Time	Received by:
Relinquished by: Eric J Polzin	4/15/99	1550	FedEx
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:
Relinquished by:	Date	Time	Received by:

Remarks:
Invoice to Time Oil Co.
Scott Sloan

Sheet 1 of 1

04/20/1999 10:05 509-465-2199 MAXIM TECH PAGE 05

APPENDIX C

VAPOR EXTRACTION TEST FIELD DATA

TABLE C-1

Summary of Vapor Extraction Test Data
Time Oil Property # 01-068
Sunnyside, WA

MW-3 SYSTEM TEST START 1045

TIME	VAC (IOW)	CO (ppm)	CO2 (ppm)	O2 (%)	PID (ppm)	FLOW (fpm)	(cfm)
1050	60	0	3.1	16.3	456	1140	24.9
1055	60	0	2.12	17.8	406	1000	21.8
1105	60	0	2.46	17.5	436	1100	24.0
1115	60	0	2.3	17.8	465	1110	24.2
1130	60	0	1.96	18.2	472	1097	23.9
1137	60	0	1.68	18.5	491	1100	24.0
1145	60	0	1.9	18.3	489	1070	23.3

Monitoring Point Data

TIME	MW-1		MW-2		MW-16		VP-1	
	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
1000	0	13.01	0	15.67	0	17.88	0	NA
1053	0	NM	0.02	NM	0	NM	0	NA
1101	0	NM	0	NM	0	NM	0	NA
1111	0	13.01	0	15.65	0	17.88	0	NA
1122	0	NM	0	NM	0	NM	0	NA

NOTE:
NM - Not Measured
NA - Data set Not Applicable

TABLE C-2

Summary of Vapor Extraction Test Data
Time Oil Property # 01-068
Sunnyside, WA

MW-5 SYSTEM TEST START 1230

TIME	VAC (IOW)	CO (ppm)	CO2 (ppm)	O2 (%)	PID (ppm)	FLOW (fpm)	(cfm)
1233	60	0	0.58	18.7	236	1510	32.9
1245	60	0	0.6	18.6	289	1460	31.8
1250	60	0	0.58	18.8	223	1480	32.3
1300	60	0	0.68	18.5	268	1510	32.9
1310	60	0	0.68	18.5	284	1620	35.3
1320	60	0	0.64	18.6	276	1510	32.9
1330	60	0	0.54	18.9	286	1500	32.7

Monitoring Point Data

TIME	MW-3		MW-4		VP-1		VP-2	
	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
1250	0.04	NM	0.2	NM	0.11	NA	0.02	NA
1300	0.04	13.88	0.16	17.97	0.12	NA	0.08	NA
1315	0.02	NM	0.14	NM	0.12	NA	0.06	NA
1325	0.02	NM	0.04	NM	0.12	NA	0.06	NA

NOTE:
NM - Not Measured
NA - Data set Not Applicable

TABLE C-3
Summary of Vapor Extraction Test Data
Time Oil Property # 01-068
Sunnyside, WA

MW-4 SYSTEM TEST START 1350

TIME	VAC (IOW)	CO (ppm)	CO2 (ppm)	O2 (%)	PID (ppm)	FLOW (fpm)	(cfm)
1355	60	0	1.02	17.7	438	2020	44.0
1400	60	0	1.04	17.7	417	2080	45.3
1410	60	0	1.06	17.6	357	2300	50.1
1420	60	0	1.06	17.8	442	2130	46.4
1430	60	0	1.06	17.8	360	2450	53.4
1440	60	0	1.08	17.8	351	2520	54.9
1450	60	0	0.98	18.1	348	2250	49.1

Monitoring Point Data

TIME	MW-3		MW-5		VP-1		VP-2	
	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
1356	0.01	NM	0.16	NM	4.0	NA	1.0	NA
1407	0	14.55	0.24	17.42	3.5	NA	1.0	NA
1420	0.02	NM	0.24	NM	3.0	NA	1.0	NA
1435	0	NM	0.26	NM	3.5	NA	1.0	NA
1445	0.02	NM	0.18	NM	2.5	NA	1.0	NA

NOTE:
NM - Not Measured
NA - Data set Not Applicable

TABLE C-4

Summary of Vapor Extraction Test Data
Time Oil Property # 01-068
Sunnyside, WA

MANIFOLD TEST START 1500

WELL	TIME	VAC (IOW)	CO (ppm)	CO2 (ppm)	O2 (%)	PID (ppm)	FLOW (fpm)	(cfm)
MW-3	1510	70	0	2.74	17.4	701	1150	25.1
	1530	70	0	2.5	17.8	1048	1450	31.6
	1545	70	0	2.98	17.4	1477	1377	30.0
	1600	70	0	3.64	16.8	1664	1420	31.0
MW-4	1510	70	0	0.86	18.6	301	3000	65.4
	1530	70	0	0.68	18.9	217	3240	70.6
	1545	70	0	0.8	18.7	278	2820	61.5
	1600	70	0	0.78	18.9	163	2500	54.5
MW-5	1510	70	0	0.42	19.4	235	1645	35.9
	1530	70	0	0.44	19.2	253	1910	41.6
	1545	70	0	0.44	19.3	159	1910	41.6
	1600	70	0	0.46	19.3	271	1750	38.2

Monitoring Point Data

TIME	MW-1		MW-2		VP-1		VP-2	
	VAC	DTW	VAC	DTW	VAC	DTW	VAC	DTW
1518	0	13.01	0.02	15.66	2.0	NA	1.0	NA
1325	0	NM	0.04	NM	3.5	NA	1.0	NA
1535	0	NM	0.06	NM	4.0	NA	1.5	NA
1547	0	NM	0.06	NM	4.0	NA	1.0	NA
1554	0	12.99	0.06	15.63	3.0	NA	1.0	NA

NOTE:
NM - Not Measured
NA - Data set Not Applicable

APPENDIX D

ANALYTICAL TEST CERTIFICATES - AIR

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

LABORATORY REPORT

Client:	TIME OIL COMPANY	Date of Report:	06/03/99
Address:	2737 West Commodore Way	Date Received:	05/18/99
	Seattle, WA 98199-1233	PAI Project No:	P9900998
Contact:	Mr. Scott Sloan	Purchase Order:	Verbal

Client Project ID: Time Oil Property 01-068 #9904808.100

Ten (10) Stainless Steel Summa Canisters labeled:

"BES-1B"	"VET-1B"	"BES-3B"	"BES-3A"	"SVES-1B"
"SVES-1A"	"VET-1A"	"BES-2B"	"BES-2A"	"BES-1A"

The samples were received at the laboratory under chain of custody on May 18, 1999. The samples were received intact. The dates of analysis are indicated on the attached data sheets.

Speciated Hydrocarbon Analysis

The samples were analyzed for speciated hydrocarbons and total non-Methane hydrocarbons using a gas chromatograph equipped with a flame ionization detector. The analyses were performed using the protocol outlined in the Technical Assistance Document for Sampling and Analysis of Ozone Precursors, EPA 600/8-91-215, U.S. Environmental Protection Agency, Research Triangle Park, NC, October, 1991.

The results of analyses are given on the attached data summary sheet.

Data Release Authorization:

Wade Henton
Analytical Chemist

Reviewed and Approved:

Michael Tuday
Laboratory Director

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-1B
PAI Sample ID : P9900998-001

Test Code :	Analysis For Ozone Precursors	Date Sampled :	5/11/99
Instrument :	HP GC 6890A/FID/Tekmar 5010	Date Received :	5/18/99
Analyst :	Wade Henton	Date Analyzed :	5/26/99
Matrix :	Summa Canister	Volume(s) Analyzed :	0.20 ml

Pi 1 = -0.1 Pf 1 = 3.6

D.F. = 1.25

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	39,000	1,300
00142-29-0	Cyclopentene	14,000	1,300
00691-37-2	4-Methyl-1-pentene	13,000	1,300
00287-92-3	Cyclopentane	79,000	1,300
00079-29-8	2,3-Dimethylbutane	95,000	1,300
01634-04-4	Methyl tert-Butyl Ether	17,000	1,300
00107-83-5	2-Methylpentane	420,000	1,300
00096-14-0	3-Methylpentane	270,000	1,300
00592-41-6	1-Hexene	15,000	1,300
00110-54-3	n-Hexane	280,000	1,300
04050-45-7	trans-2-Hexene	23,000	1,300
00625-27-4	2-Methyl-2-pentene	31,000	1,300
07688-21-3	cis-2-Hexene	12,000	1,300
00096-37-7	Methylcyclopentane	200,000	1,300
00108-08-7	2,4-Dimethylpentane	60,000	1,300
00071-43-2	Benzene	250,000	1,300
00110-82-7	Cyclohexane	67,000	1,300
00591-76-4	2-Methylhexane	190,000	1,300
00565-59-3	2,3-Dimethylpentane	140,000	1,300
00589-34-4	3-Methylhexane	210,000	1,300
00592-76-7 00540-84-1	1-Heptene + Isooctane	190,000	1,300
00142-82-5	n-Heptane	210,000	1,300
00108-87-2	Methylcyclohexane	78,000	1,300
00589-43-5	2,4-Dimethylhexane	67,000	1,300
00565-75-3	2,3,4-Trimethylpentane	110,000	1,900

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RCS By: 6/2/99

2665 Park Center Drive, Suite D, Simi Valley, California 93065 • Phone (805) 526-7161• Fax (805) 526-7270

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-1B
PAI Sample ID : P9900998-001

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/11/99
Date Received : 5/18/99
Date Analyzed : 5/26/99
Volume(s) Analyzed : 0.20 ml

Pi 1 = -0.1 Pf 1 = 3.6

D.F. = 1.25

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	1,300,000	1,900
00592-27-8	2-Methylheptane	110,000	1,900
00111-60-0	1-Octene	18,000	1,900
00111-65-9	n-Octane	86,000	1,900
00100-41-4	Ethylbenzene	200,000	1,900
00108-38-3	m-Xylene	600,000	1,900
00106-42-3	p-Xylene	190,000	1,900
00100-42-5	Styrene	ND	1,900
00095-47-6	o-Xylene	250,000	2,500
00124-11-8	1-Nonene	ND	2,500
00111-84-2	n-Nonane	16,000	2,500
00098-82-8	Cumene	8,000	2,500
07785-70-8	a-Pinene	ND	2,500
00103-65-1	n-Propylbenzene	32,000	2,500
00620-14-4	m-Ethyltoluene	94,000	2,500
00622-96-8	p-Ethyltoluene	48,000	2,500
00108-67-8	1,3,5-Trimethylbenzene	55,000	2,500
00611-14-3	o-Ethyltoluene	35,000	2,500
18172-67-3	b-Pinene	ND	2,500
00095-63-6	1,2,4-Trimethylbenzene	92,000	5,000
00124-18-5	n-Decane	5,200	5,000
00099-87-6	p-Cymene	ND	5,000
05989-27-5	d-Limonene	11,000	5,000
00105-05-5	1,4-Diethylbenzene	ND	5,000
00104-51-8	n-Butylbenzene	13,000	5,000

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RC By: 6/2/99

2665 Park Center Drive, Suite D, Simi Valley, California 93065 • Phone (805) 526-7161 • Fax (805) 526-7270

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-1B
PAI Sample ID : P9900998-001

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/11/99
Date Received : 5/18/99
Date Analyzed : 5/26/99
Volume(s) Analyzed : 0.20 ml

Pi 1 = -0.1 Pf 1 = 3.6

D.F. = 1.25

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	1,300
00074-86-2	Acetylene	ND	2,500
00074-84-0	Ethane	ND	1,300
00115-07-1	Propylene	ND	1,300
00074-98-6	Propane	4,100	1,300
00074-99-7	Methylacetylene	ND	1,300
00075-28-5	Isobutane	130,000	1,300
00115-11-7	Isobutylene	7,700	1,300
00106-98-9	1-Butene	6,900	1,300
00106-99-0	1,3-Butadiene	ND	1,300
00106-97-8	n-Butane	740,000	1,300
00624-64-6	trans-2-Butene	16,000	1,300
00463-82-1	2,2-Dimethylpropane	4,800	1,300
00107-00-6	Ethylacetylene	ND	1,300
00590-18-1	cis-2-Butene	16,000	1,300
00078-78-4	Isopentane	1,300,000	1,300
00503-17-3	Dimethylacetylene	ND	1,300
00109-67-1	1-Pentene	35,000	1,300
00563-46-2	2-Methyl-1-butene	74,000	1,300
00109-66-0	n-Pentane	660,000	1,300
00078-79-5	Isoprene	ND	1,300
00646-04-8	trans-2-Pentene	75,000	1,300
00627-20-3	cis-2-Pentene	38,000	1,300
00513-35-9	2-Methyl-2-butene	110,000	1,300

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2/99

2665 Park Center Drive, Suite D, Simi Valley, California 93065 • Phone (805) 526-7161 • Fax (805) 526-7270

Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : VET-1B
PAI Sample ID : P9900998-002

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/10/99
Date Received : 5/18/99
Date Analyzed : 5/26/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -1.6 Pf 1 = 3.5

D.F. = 1.39

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	250
00074-86-2	Acetylene	ND	500
00074-84-0	Ethane	ND	250
00115-07-1	Propylene	ND	250
00074-98-6	Propane	510	250
00074-99-7	Methylacetylene	ND	250
00075-28-5	Isobutane	24,000	250
00115-11-7	Isobutylene	910	250
00106-98-9	1-Butene	980	250
00106-99-0	1,3-Butadiene	ND	250
00106-97-8	n-Butane	140,000	250
00624-64-6	trans-2-Butene	2,400	250
00463-82-1	2,2-Dimethylpropane	1,000	250
00107-00-6	Ethylacetylene	ND	250
00590-18-1	cis-2-Butene	2,400	250
00078-78-4	Isopentane	340,000	250
00503-17-3	Dimethylacetylene	ND	250
00109-67-1	1-Pentene	8,000	250
00563-46-2	2-Methyl-1-butene	16,000	250
00109-66-0	n-Pentane	180,000	250
00078-79-5	Isoprene	ND	250
00646-04-8	trans-2-Pentene	19,000	250
00627-20-3	cis-2-Pentene	9,300	250
00513-35-9	2-Methyl-2-butene	27,000	250

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

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Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : VET-1B
PAI Sample ID : P9900998-002

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/10/99
Date Received : 5/18/99
Date Analyzed : 5/26/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -1.6 Pf 1 = 3.5

D.F. = 1.39

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	13,000	250
00142-29-0	Cyclopentene	3,200	250
00691-37-2	4-Methyl-1-pentene	1,900	250
00287-92-3	Cyclopentane	21,000	250
00079-29-8	2,3-Dimethylbutane	33,000	250
01634-04-4	Methyl tert-Butyl Ether	3,200	250
00107-83-5	2-Methylpentane	140,000	250
00096-14-0	3-Methylpentane	87,000	250
00592-41-6	1-Hexene	4,100	250
00110-54-3	n-Hexane	82,000	250
04050-45-7	trans-2-Hexene	6,300	250
00625-27-4	2-Methyl-2-pentene	9,600	250
07688-21-3	cis-2-Hexene	3,400	250
00096-37-7	Methylcyclopentane	53,000	250
00108-08-7	2,4-Dimethylpentane	17,000	250
00071-43-2	Benzene	27,000	250
00110-82-7	Cyclohexane	15,000	250
00591-76-4	2-Methylhexane	32,000	250
00565-59-3	2,3-Dimethylpentane	29,000	250
00589-34-4	3-Methylhexane	33,000	250
00592-76-7 00540-84-1	1-Heptene + Isooctane	34,000	250
00142-82-5	n-Heptane	20,000	250
00108-87-2	Methylcyclohexane	9,800	250
00589-43-5	2,4-Dimethylhexane	7,200	250
00565-75-3	2,3,4-Trimethylpentane	12,000	380

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : VET-1B
PAI Sample ID : P9900998-002

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/10/99
Date Received : 5/18/99
Date Analyzed : 5/26/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -1.6 Pf 1 = 3.5

D.F. = 1.39

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	60,000	380
00592-27-8	2-Methylheptane	7,700	380
00111-60-0	1-Octene	1,200	380
00111-65-9	n-Octane	4,400	380
00100-41-4	Ethylbenzene	5,000	380
00108-38-3	m-Xylene	25,000	380
00106-42-3	p-Xylene	8,700	380
00100-42-5	Styrene	ND	380
00095-47-6	o-Xylene	9,100	500
00124-11-8	1-Nonene	ND	500
00111-84-2	n-Nonane	ND	500
00098-82-8	Cumene	ND	500
07785-70-8	a-Pinene	ND	500
00103-65-1	n-Propylbenzene	ND	500
00620-14-4	m-Ethyltoluene	3,000	500
00622-96-8	p-Ethyltoluene	1,700	500
00108-67-8	1,3,5-Trimethylbenzene	2,400	500
00611-14-3	o-Ethyltoluene	1,400	500
18172-67-3	b-Pinene	ND	500
00095-63-6	1,2,4-Trimethylbenzene	3,300	1,000
00124-18-5	n-Decane	ND	1,000
00099-87-6	p-Cymene	ND	1,000
05989-27-5	d-Limonene	ND	1,000
00105-05-5	1,4-Diethylbenzene	ND	1,000
00104-51-8	n-Butylbenzene	ND	1,000

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Performance Analytical Inc.
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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-3B
PAI Sample ID : P9900998-003

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/13/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.8 Pf 1 = 3.5

D.F. = 1.31

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	500
00074-86-2	Acetylene	ND	1,000
00074-84-0	Ethane	ND	500
00115-07-1	Propylene	ND	500
00074-98-6	Propane	1,500	500
00074-99-7	Methylacetylene	ND	500
00075-28-5	Isobutane	53,000	500
00115-11-7	Isobutylene	4,000	500
00106-98-9	1-Butene	3,300	500
00106-99-0	1,3-Butadiene	ND	500
00106-97-8	n-Butane	340,000	500
00624-64-6	trans-2-Butene	8,900	500
00463-82-1	2,2-Dimethylpropane	2,300	500
00107-00-6	Ethylacetylene	ND	500
00590-18-1	cis-2-Butene	9,200	500
00078-78-4	Isopentane	720,000	500
00503-17-3	Dimethylacetylene	ND	500
00109-67-1	1-Pentene	22,000	500
00563-46-2	2-Methyl-1-butene	47,000	500
00109-66-0	n-Pentane	400,000	500
00078-79-5	Isoprene	1,100	500
00646-04-8	trans-2-Pentene	50,000	500
00627-20-3	cis-2-Pentene	26,000	500
00513-35-9	2-Methyl-2-butene	73,000	500

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-3B
PAI Sample ID : P9900998-003

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/13/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.8 Pf 1 = 3.5

D.F. = 1.31

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	22,000	500
00142-29-0	Cyclopentene	9,600	500
00691-37-2	4-Methyl-1-pentene	3,900	500
00287-92-3	Cyclopentane	49,000	500
00079-29-8	2,3-Dimethylbutane	53,000	500
01634-04-4	Methyl tert-Butyl Ether	8,400	500
00107-83-5	2-Methylpentane	230,000	500
00096-14-0	3-Methylpentane	140,000	500
00592-41-6	1-Hexene	7,200	500
00110-54-3	n-Hexane	140,000	500
04050-45-7	trans-2-Hexene	11,000	500
00625-27-4	2-Methyl-2-pentene	15,000	500
07688-21-3	cis-2-Hexene	5,800	500
00096-37-7	Methylcyclopentane	81,000	500
00108-08-7	2,4-Dimethylpentane	20,000	500
00071-43-2	Benzene	85,000	500
00110-82-7	Cyclohexane	20,000	500
00591-76-4	2-Methylhexane	37,000	500
00565-59-3	2,3-Dimethylpentane	29,000	500
00589-34-4	3-Methylhexane	36,000	500
00592-76-7 00540-84-1	1-Heptene + Isooctane	28,000	500
00142-82-5	n-Heptane	23,000	500
00108-87-2	Methylcyclohexane	8,500	500
00589-43-5	2,4-Dimethylhexane	5,200	500
00565-75-3	2,3,4-Trimethylpentane	7,500	750

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-3B
PAI Sample ID : P9900998-003

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/13/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.8 Pf 1 = 3.5

D.F. = 1.31

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	84,000	750
00592-27-8	2-Methylheptane	6,300	750
00111-60-0	1-Octene	2,100	750
00111-65-9	n-Octane	3,300	750
00100-41-4	Ethylbenzene	5,400	750
00108-38-3	m-Xylene	21,000	750
00106-42-3	p-Xylene	8,800	750
00100-42-5	Styrene	ND	750
00095-47-6	o-Xylene	8,200	1,000
00124-11-8	1-Nonene	ND	1,000
00111-84-2	n-Nonane	ND	1,000
00098-82-8	Cumene	ND	1,000
07785-70-8	a-Pinene	ND	1,000
00103-65-1	n-Propylbenzene	ND	1,000
00620-14-4	m-Ethyltoluene	2,500	1,000
00622-96-8	p-Ethyltoluene	1,500	1,000
00108-67-8	1,3,5-Trimethylbenzene	1,800	1,000
00611-14-3	o-Ethyltoluene	ND	1,000
18172-67-3	b-Pinene	ND	1,000
00095-63-6	1,2,4-Trimethylbenzene	3,200	2,000
00124-18-5	n-Decane	ND	2,000
00099-87-6	p-Cymene	ND	2,000
05989-27-5	d-Limonene	ND	2,000
00105-05-5	1,4-Diethylbenzene	ND	2,000
00104-51-8	n-Butylbenzene	ND	2,000

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-3A
PAI Sample ID : P9900998-004

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/12/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.6 Pf 1 = 3.5

D.F. = 1.29

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	500
00074-86-2	Acetylene	ND	1,000
00074-84-0	Ethane	950	500
00115-07-1	Propylene	ND	500
00074-98-6	Propane	2,300	500
00074-99-7	Methylacetylene	ND	500
00075-28-5	Isobutane	82,000	500
00115-11-7	Isobutylene	6,200	500
00106-98-9	1-Butene	5,100	500
00106-99-0	1,3-Butadiene	ND	500
00106-97-8	n-Butane	520,000	500
00624-64-6	trans-2-Butene	13,000	500
00463-82-1	2,2-Dimethylpropane	2,800	500
00107-00-6	Ethylacetylene	ND	500
00590-18-1	cis-2-Butene	13,000	500
00078-78-4	Isopentane	920,000	500
00503-17-3	Dimethylacetylene	ND	500
00109-67-1	1-Pentene	27,000	500
00563-46-2	2-Methyl-1-butene	57,000	500
00109-66-0	n-Pentane	480,000	500
00078-79-5	Isoprene	1,100	500
00646-04-8	trans-2-Pentene	59,000	500
00627-20-3	cis-2-Pentene	31,000	500
00513-35-9	2-Methyl-2-butene	85,000	500

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ND = Not Detected

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-3A
PAI Sample ID : P9900998-004

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/12/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.6 Pf 1 = 3.5

D.F. = 1.29

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	26,000	500
00142-29-0	Cyclopentene	11,000	500
00691-37-2	4-Methyl-1-pentene	9,000	500
00287-92-3	Cyclopentane	57,000	500
00079-29-8	2,3-Dimethylbutane	62,000	500
01634-04-4	Methyl tert-Butyl Ether	11,000	500
00107-83-5	2-Methylpentane	270,000	500
00096-14-0	3-Methylpentane	170,000	500
00592-41-6	1-Hexene	9,000	500
00110-54-3	n-Hexane	160,000	500
04050-45-7	trans-2-Hexene	13,000	500
00625-27-4	2-Methyl-2-pentene	18,000	500
07688-21-3	cis-2-Hexene	7,000	500
00096-37-7	Methylcyclopentane	98,000	500
00108-08-7	2,4-Dimethylpentane	23,000	500
00071-43-2	Benzene	110,000	500
00110-82-7	Cyclohexane	24,000	500
00591-76-4	2-Methylhexane	43,000	500
00565-59-3	2,3-Dimethylpentane	32,000	500
00589-34-4	3-Methylhexane	43,000	500
00592-76-7 00540-84-1	1-Heptene + Isooctane	30,000	500
00142-82-5	n-Heptane	30,000	500
00108-87-2	Methylcyclohexane	9,700	500
00589-43-5	2,4-Dimethylhexane	6,500	500
00565-75-3	2,3,4-Trimethylpentane	9,400	750

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-3A
PAI Sample ID : P9900998-004

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/12/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.6 Pf 1 = 3.5

D.F. = 1.29

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	120,000	750
00592-27-8	2-Methylheptane	8,100	750
00111-60-0	1-Octene	1,100	750
00111-65-9	n-Octane	4,700	750
00100-41-4	Ethylbenzene	10,000	750
00108-38-3	m-Xylene	38,000	750
00106-42-3	p-Xylene	12,000	750
00100-42-5	Styrene	ND	750
00095-47-6	o-Xylene	16,000	1,000
00124-11-8	1-Nonene	ND	1,000
00111-84-2	n-Nonane	ND	1,000
00098-82-8	Cumene	ND	1,000
07785-70-8	a-Pinene	ND	1,000
00103-65-1	n-Propylbenzene	1,600	1,000
00620-14-4	m-Ethyltoluene	5,900	1,000
00622-96-8	p-Ethyltoluene	3,300	1,000
00108-67-8	1,3,5-Trimethylbenzene	4,000	1,000
00611-14-3	o-Ethyltoluene	2,300	1,000
18172-67-3	b-Pinene	ND	1,000
00095-63-6	1,2,4-Trimethylbenzene	7,100	2,000
00124-18-5	n-Decane	ND	2,000
00099-87-6	p-Cymene	ND	2,000
05989-27-5	d-Limonene	ND	2,000
00105-05-5	1,4-Diethylbenzene	ND	2,000
00104-51-8	n-Butylbenzene	ND	2,000

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : SVES-1B
PAI Sample ID : P9900998-005

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/14/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -0.3 Pf 1 = 3.4

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	250
00074-86-2	Acetylene	ND	500
00074-84-0	Ethane	ND	250
00115-07-1	Propylene	ND	250
00074-98-6	Propane	530	250
00074-99-7	Methylacetylene	ND	250
00075-28-5	Isobutane	37,000	250
00115-11-7	Isobutylene	1,100	250
00106-98-9	1-Butene	1,300	250
00106-99-0	1,3-Butadiene	ND	250
00106-97-8	n-Butane	200,000	250
00624-64-6	trans-2-Butene	3,000	250
00463-82-1	2,2-Dimethylpropane	1,200	250
00107-00-6	Ethylacetylene	ND	250
00590-18-1	cis-2-Butene	2,900	250
00078-78-4	Isopentane	320,000	250
00503-17-3	Dimethylacetylene	ND	250
00109-67-1	1-Pentene	7,900	250
00563-46-2	2-Methyl-1-butene	16,000	250
00109-66-0	n-Pentane	170,000	250
00078-79-5	Isoprene	ND	250
00646-04-8	trans-2-Pentene	18,000	250
00627-20-3	cis-2-Pentene	8,600	250
00513-35-9	2-Methyl-2-butene	25,000	250

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : SVES-1B
PAI Sample ID : P9900998-005

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/14/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -0.3 Pf 1 = 3.4

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	9,700	250
00142-29-0	Cyclopentene	2,700	250
00691-37-2	4-Methyl-1-pentene	3,000	250
00287-92-3	Cyclopentane	17,000	250
00079-29-8	2,3-Dimethylbutane	23,000	250
01634-04-4	Methyl tert-Butyl Ether	2,000	250
00107-83-5	2-Methylpentane	98,000	250
00096-14-0	3-Methylpentane	60,000	250
00592-41-6	1-Hexene	2,900	250
00110-54-3	n-Hexane	56,000	250
04050-45-7	trans-2-Hexene	4,200	250
00625-27-4	2-Methyl-2-pentene	6,200	250
07688-21-3	cis-2-Hexene	2,200	250
00096-37-7	Methylcyclopentane	32,000	250
00108-08-7	2,4-Dimethylpentane	8,900	250
00071-43-2	Benzene	19,000	250
00110-82-7	Cyclohexane	7,900	250
00591-76-4	2-Methylhexane	16,000	250
00565-59-3	2,3-Dimethylpentane	13,000	250
00589-34-4	3-Methylhexane	16,000	250
00592-76-7 00540-84-1	1-Heptene + Isooctane	13,000	250
00142-82-5	n-Heptane	9,900	250
00108-87-2	Methylcyclohexane	3,800	250
00589-43-5	2,4-Dimethylhexane	2,700	250
00565-75-3	2,3,4-Trimethylpentane	4,100	380

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2/99

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : SVES-1B
PAI Sample ID : P9900998-005

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/14/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -0.3 Pf 1 = 3.4

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	28,000	380
00592-27-8	2-Methylheptane	3,100	380
00111-60-0	1-Octene	460	380
00111-65-9	n-Octane	1,700	380
00100-41-4	Ethylbenzene	2,000	380
00108-38-3	m-Xylene	9,300	380
00106-42-3	p-Xylene	4,300	380
00100-42-5	Styrene	ND	380
00095-47-6	o-Xylene	4,000	500
00124-11-8	1-Nonene	ND	500
00111-84-2	n-Nonane	ND	500
00098-82-8	Cumene	ND	500
07785-70-8	a-Pinene	ND	500
00103-65-1	n-Propylbenzene	ND	500
00620-14-4	m-Ethyltoluene	1,300	500
00622-96-8	p-Ethyltoluene	870	500
00108-67-8	1,3,5-Trimethylbenzene	1,100	500
00611-14-3	o-Ethyltoluene	ND	500
18172-67-3	b-Pinene	ND	500
00095-63-6	1,2,4-Trimethylbenzene	1,600	1,000
00124-18-5	n-Decane	ND	1,000
00099-87-6	p-Cymene	ND	1,000
05989-27-5	d-Limonene	ND	1,000
00105-05-5	1,4-Diethylbenzene	ND	1,000
00104-51-8	n-Butylbenzene	ND	1,000

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2/99

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : SVES-1A
PAI Sample ID : P9900998-006

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/14/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 10.0 ml

Pi 1 = -0.3 Pf 1 = 3.5

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	77	25
00074-86-2	Acetylene	120	50
00074-84-0	Ethane	ND	25
00115-07-1	Propylene	ND	25
00074-98-6	Propane	34	25
00074-99-7	Methylacetylene	ND	25
00075-28-5	Isobutane	1,400	25
00115-11-7	Isobutylene	51	25
00106-98-9	1-Butene	69	25
00106-99-0	1,3-Butadiene	ND	25
00106-97-8	n-Butane	7,400	25
00624-64-6	trans-2-Butene	140	25
00463-82-1	2,2-Dimethylpropane	46	25
00107-00-6	Ethylacetylene	ND	25
00590-18-1	cis-2-Butene	150	25
00078-78-4	Isopentane	12,000	25
00503-17-3	Dimethylacetylene	ND	25
00109-67-1	1-Pentene	330	25
00563-46-2	2-Methyl-1-butene	720	25
00109-66-0	n-Pentane	6,100	25
00078-79-5	Isoprene	ND	25
00646-04-8	trans-2-Pentene	750	25
00627-20-3	cis-2-Pentene	380	25
00513-35-9	2-Methyl-2-butene	1,100	25

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : SVES-1A
PAI Sample ID : P9900998-006

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/14/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 10.0 ml

Pi 1 = -0.3 Pf 1 = 3.5

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	370	25
00142-29-0	Cyclopentene	140	25
00691-37-2	4-Methyl-1-pentene	130	25
00287-92-3	Cyclopentane	750	25
00079-29-8	2,3-Dimethylbutane	960	25
01634-04-4	Methyl tert-Butyl Ether	85	25
00107-83-5	2-Methylpentane	4,100	25
00096-14-0	3-Methylpentane	2,600	25
00592-41-6	1-Hexene	140	25
00110-54-3	n-Hexane	2,500	25
04050-45-7	trans-2-Hexene	200	25
00625-27-4	2-Methyl-2-pentene	310	25
07688-21-3	cis-2-Hexene	110	25
00096-37-7	Methylcyclopentane	1,500	25
00108-08-7	2,4-Dimethylpentane	450	25
00071-43-2	Benzene	1,100	25
00110-82-7	Cyclohexane	420	25
00591-76-4	2-Methylhexane	820	25
00565-59-3	2,3-Dimethylpentane	730	25
00589-34-4	3-Methylhexane	840	25
00592-76-7 00540-84-1	1-Heptene + Isooctane	730	25
00142-82-5	n-Heptane	540	25
00108-87-2	Methylcyclohexane	190	25
00589-43-5	2,4-Dimethylhexane	160	25
00565-75-3	2,3,4-Trimethylpentane	200	38

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2/99

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : SVES-1A
PAI Sample ID : P9900998-006

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/14/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 10.0 ml

Pi 1 = -0.3 Pf 1 = 3.5

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	1,800	38
00592-27-8	2-Methylheptane	170	38
00111-60-0	1-Octene	ND	38
00111-65-9	n-Octane	86	38
00100-41-4	Ethylbenzene	120	38
00108-38-3	m-Xylene	480	38
00106-42-3	p-Xylene	200	38
00100-42-5	Styrene	ND	38
00095-47-6	o-Xylene	200	50
00124-11-8	1-Nonene	ND	50
00111-84-2	n-Nonane	ND	50
00098-82-8	Cumene	ND	50
07785-70-8	a-Pinene	ND	50
00103-65-1	n-Propylbenzene	ND	50
00620-14-4	m-Ethyltoluene	81	50
00622-96-8	p-Ethyltoluene	ND	50
00108-67-8	1,3,5-Trimethylbenzene	69	50
00611-14-3	o-Ethyltoluene	ND	50
18172-67-3	b-Pinene	ND	50
00095-63-6	1,2,4-Trimethylbenzene	120	100
00124-18-5	n-Decane	ND	100
00099-87-6	p-Cymene	ND	100
05989-27-5	d-Limonene	ND	100
00105-05-5	1,4-Diethylbenzene	ND	100
00104-51-8	n-Butylbenzene	ND	100

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RC-5 By: 6/2/99

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : VET-1A
PAI Sample ID : P9900998-007

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/10/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -1.5 Pf 1 = 3.5

D.F. = 1.38

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	370	250
00074-86-2	Acetylene	ND	500
00074-84-0	Ethane	ND	250
00115-07-1	Propylene	ND	250
00074-98-6	Propane	ND	250
00074-99-7	Methylacetylene	ND	250
00075-28-5	Isobutane	12,000	250
00115-11-7	Isobutylene	380	250
00106-98-9	1-Butene	490	250
00106-99-0	1,3-Butadiene	ND	250
00106-97-8	n-Butane	76,000	250
00624-64-6	trans-2-Butene	990	250
00463-82-1	2,2-Dimethylpropane	600	250
00107-00-6	Ethylacetylene	ND	250
00590-18-1	cis-2-Butene	1,100	250
00078-78-4	Isopentane	190,000	250
00503-17-3	Dimethylacetylene	ND	250
00109-67-1	1-Pentene	4,400	250
00563-46-2	2-Methyl-1-butene	9,200	250
00109-66-0	n-Pentane	110,000	250
00078-79-5	Isoprene	ND	250
00646-04-8	trans-2-Pentene	11,000	250
00627-20-3	cis-2-Pentene	5,300	250
00513-35-9	2-Methyl-2-butene	15,000	250

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : VET-1A
PAI Sample ID : P9900998-007

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/10/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -1.5 Pf 1 = 3.5

D.F. = 1.38

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	7,700	250
00142-29-0	Cyclopentene	1,800	250
00691-37-2	4-Methyl-1-pentene	2,500	250
00287-92-3	Cyclopentane	12,000	250
00079-29-8	2,3-Dimethylbutane	21,000	250
01634-04-4	Methyl tert-Butyl Ether	1,900	250
00107-83-5	2-Methylpentane	86,000	250
00096-14-0	3-Methylpentane	56,000	250
00592-41-6	1-Hexene	2,600	250
00110-54-3	n-Hexane	52,000	250
04050-45-7	trans-2-Hexene	3,900	250
00625-27-4	2-Methyl-2-pentene	6,200	250
07688-21-3	cis-2-Hexene	2,100	250
00096-37-7	Methylcyclopentane	35,000	250
00108-08-7	2,4-Dimethylpentane	12,000	250
00071-43-2	Benzene	13,000	250
00110-82-7	Cyclohexane	10,000	250
00591-76-4	2-Methylhexane	20,000	250
00565-59-3	2,3-Dimethylpentane	21,000	250
00589-34-4	3-Methylhexane	22,000	250
00592-76-7 00540-84-1	1-Heptene + Isooctane	24,000	250
00142-82-5	n-Heptane	12,000	250
00108-87-2	Methylcyclohexane	6,100	250
00589-43-5	2,4-Dimethylhexane	4,800	250
00565-75-3	2,3,4-Trimethylpentane	7,800	380

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : VET-1A
PAI Sample ID : P9900998-007

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/10/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 1.0 ml

Pi 1 = -1.5 Pf 1 = 3.5

D.F. = 1.38

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	24,000	380
00592-27-8	2-Methylheptane	4,300	380
00111-60-0	1-Octene	670	380
00111-65-9	n-Octane	1,900	380
00100-41-4	Ethylbenzene	1,100	380
00108-38-3	m-Xylene	6,900	380
00106-42-3	p-Xylene	2,900	380
00100-42-5	Styrene	ND	380
00095-47-6	o-Xylene	2,800	500
00124-11-8	1-Nonene	ND	500
00111-84-2	n-Nonane	ND	500
00098-82-8	Cumene	ND	500
07785-70-8	a-Pinene	ND	500
00103-65-1	n-Propylbenzene	ND	500
00620-14-4	m-Ethyltoluene	ND	500
00622-96-8	p-Ethyltoluene	ND	500
00108-67-8	1,3,5-Trimethylbenzene	770	500
00611-14-3	o-Ethyltoluene	ND	500
18172-67-3	b-Pinene	ND	500
00095-63-6	1,2,4-Trimethylbenzene	ND	1,000
00124-18-5	n-Decane	ND	1,000
00099-87-6	p-Cymene	ND	1,000
05989-27-5	d-Limonene	ND	1,000
00105-05-5	1,4-Diethylbenzene	ND	1,000
00104-51-8	n-Butylbenzene	ND	1,000

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-2B
PAI Sample ID : P9900998-008

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/12/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.7 Pf 1 = 3.5

D.F. = 1.30

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	500
00074-86-2	Acetylene	ND	1,000
00074-84-0	Ethane	1,200	500
00115-07-1	Propylene	ND	500
00074-98-6	Propane	2,400	500
00074-99-7	Methylacetylene	ND	500
00075-28-5	Isobutane	80,000	500
00115-11-7	Isobutylene	5,700	500
00106-98-9	1-Butene	4,600	500
00106-99-0	1,3-Butadiene	ND	500
00106-97-8	n-Butane	500,000	500
00624-64-6	trans-2-Butene	12,000	500
00463-82-1	2,2-Dimethylpropane	3,000	500
00107-00-6	Ethylacetylene	ND	500
00590-18-1	cis-2-Butene	12,000	500
00078-78-4	Isopentane	860,000	500
00503-17-3	Dimethylacetylene	ND	500
00109-67-1	1-Pentene	25,000	500
00563-46-2	2-Methyl-1-butene	52,000	500
00109-66-0	n-Pentane	440,000	500
00078-79-5	Isoprene	1,000	500
00646-04-8	trans-2-Pentene	54,000	500
00627-20-3	cis-2-Pentene	28,000	500
00513-35-9	2-Methyl-2-butene	77,000	500

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2/99

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Performance Analytical Inc.
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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-2B
PAI Sample ID : P9900998-008

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/12/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.7 Pf 1 = 3.5

D.F. = 1.30

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	25,000	500
00142-29-0	Cyclopentene	10,000	500
00691-37-2	4-Methyl-1-pentene	8,200	500
00287-92-3	Cyclopentane	52,000	500
00079-29-8	2,3-Dimethylbutane	60,000	500
01634-04-4	Methyl tert-Butyl Ether	11,000	500
00107-83-5	2-Methylpentane	250,000	500
00096-14-0	3-Methylpentane	160,000	500
00592-41-6	1-Hexene	8,100	500
00110-54-3	n-Hexane	150,000	500
04050-45-7	trans-2-Hexene	12,000	500
00625-27-4	2-Methyl-2-pentene	16,000	500
07688-21-3	cis-2-Hexene	6,400	500
00096-37-7	Methylcyclopentane	90,000	500
00108-08-7	2,4-Dimethylpentane	22,000	500
00071-43-2	Benzene	98,000	500
00110-82-7	Cyclohexane	23,000	500
00591-76-4	2-Methylhexane	39,000	500
00565-59-3	2,3-Dimethylpentane	31,000	500
00589-34-4	3-Methylhexane	40,000	500
00592-76-7 00540-84-1	1-Heptene + Isooctane	31,000	500
00142-82-5	n-Heptane	27,000	500
00108-87-2	Methylcyclohexane	10,000	500
00589-43-5	2,4-Dimethylhexane	6,000	500
00565-75-3	2,3,4-Trimethylpentane	8,800	750

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2/99

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-2B
PAI Sample ID : P9900998-008

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/12/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.50 ml

Pi 1 = -0.7 Pf 1 = 3.5

D.F. = 1.30

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	120,000	750
00592-27-8	2-Methylheptane	7,800	750
00111-60-0	1-Octene	ND	750
00111-65-9	n-Octane	4,500	750
00100-41-4	Ethylbenzene	11,000	750
00108-38-3	m-Xylene	40,000	750
00106-42-3	p-Xylene	12,000	750
00100-42-5	Styrene	ND	750
00095-47-6	o-Xylene	17,000	1,000
00124-11-8	1-Nonene	ND	1,000
00111-84-2	n-Nonane	ND	1,000
00098-82-8	Cumene	ND	1,000
07785-70-8	a-Pinene	ND	1,000
00103-65-1	n-Propylbenzene	2,000	1,000
00620-14-4	m-Ethyltoluene	7,200	1,000
00622-96-8	p-Ethyltoluene	4,100	1,000
00108-67-8	1,3,5-Trimethylbenzene	4,900	1,000
00611-14-3	o-Ethyltoluene	3,200	1,000
18172-67-3	b-Pinene	ND	1,000
00095-63-6	1,2,4-Trimethylbenzene	9,300	2,000
00124-18-5	n-Decane	ND	2,000
00099-87-6	p-Cymene	ND	2,000
05989-27-5	d-Limonene	ND	2,000
00105-05-5	1,4-Diethylbenzene	ND	2,000
00104-51-8	n-Butylbenzene	ND	2,000

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-2A
PAI Sample ID : P9900998-009

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/11/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.10 ml

Pi 1 = -0.3 Pf 1 = 3.5

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	2,500
00074-86-2	Acetylene	ND	5,000
00074-84-0	Ethane	ND	2,500
00115-07-1	Propylene	ND	2,500
00074-98-6	Propane	5,300	2,500
00074-99-7	Methylacetylene	ND	2,500
00075-28-5	Isobutane	160,000	2,500
00115-11-7	Isobutylene	8,500	2,500
00106-98-9	1-Butene	8,700	2,500
00106-99-0	1,3-Butadiene	ND	2,500
00106-97-8	n-Butane	870,000	2,500
00624-64-6	trans-2-Butene	17,000	2,500
00463-82-1	2,2-Dimethylpropane	6,800	2,500
00107-00-6	Ethylacetylene	ND	2,500
00590-18-1	cis-2-Butene	18,000	2,500
00078-78-4	Isopentane	1,500,000	2,500
00503-17-3	Dimethylacetylene	ND	2,500
00109-67-1	1-Pentene	36,000	2,500
00563-46-2	2-Methyl-1-butene	79,000	2,500
00109-66-0	n-Pentane	720,000	2,500
00078-79-5	Isoprene	ND	2,500
00646-04-8	trans-2-Pentene	77,000	2,500
00627-20-3	cis-2-Pentene	40,000	2,500
00513-35-9	2-Methyl-2-butene	120,000	2,500

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2/99

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Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-2A
PAI Sample ID : P9900998-009

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/11/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.10 ml

Pi 1 = -0.3 Pf 1 = 3.5

D.F. = 1.26

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	47,000	2,500
00142-29-0	Cyclopentene	15,000	2,500
00691-37-2	4-Methyl-1-pentene	14,000	2,500
00287-92-3	Cyclopentane	85,000	2,500
00079-29-8	2,3-Dimethylbutane	110,000	2,500
01634-04-4	Methyl tert-Butyl Ether	17,000	2,500
00107-83-5	2-Methylpentane	470,000	2,500
00096-14-0	3-Methylpentane	310,000	2,500
00592-41-6	1-Hexene	14,000	2,500
00110-54-3	n-Hexane	320,000	2,500
04050-45-7	trans-2-Hexene	25,000	2,500
00625-27-4	2-Methyl-2-pentene	36,000	2,500
07688-21-3	cis-2-Hexene	14,000	2,500
00096-37-7	Methylcyclopentane	230,000	2,500
00108-08-7	2,4-Dimethylpentane	76,000	2,500
00071-43-2	Benzene	280,000	2,500
00110-82-7	Cyclohexane	82,000	2,500
00591-76-4	2-Methylhexane	230,000	2,500
00565-59-3	2,3-Dimethylpentane	180,000	2,500
00589-34-4	3-Methylhexane	250,000	2,500
00592-76-7 00540-84-1	1-Heptene + Isooctane	250,000	2,500
00142-82-5	n-Heptane	240,000	2,500
00108-87-2	Methylcyclohexane	90,000	2,500
00589-43-5	2,4-Dimethylhexane	74,000	2,500
00565-75-3	2,3,4-Trimethylpentane	130,000	3,800

TR = Detected Below Indicated Reporting Limit
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Verified By: RG By: 6/2/99

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Performance Analytical Inc.
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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-1A
PAI Sample ID : P9900998-010

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/11/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.20 ml

Pi 1 = -0.5 Pf 1 = 3.5

D.F. = 1.28

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	1,300
00074-86-2	Acetylene	ND	2,500
00074-84-0	Ethane	ND	1,300
00115-07-1	Propylene	ND	1,300
00074-98-6	Propane	ND	1,300
00074-99-7	Methylacetylene	ND	1,300
00075-28-5	Isobutane	1,900	1,300
00115-11-7	Isobutylene	ND	1,300
00106-98-9	1-Butene	ND	1,300
00106-99-0	1,3-Butadiene	ND	1,300
00106-97-8	n-Butane	9,300	1,300
00624-64-6	trans-2-Butene	ND	1,300
00463-82-1	2,2-Dimethylpropane	ND	1,300
00107-00-6	Ethylacetylene	ND	1,300
00590-18-1	cis-2-Butene	ND	1,300
00078-78-4	Isopentane	70,000	1,300
00503-17-3	Dimethylacetylene	ND	1,300
00109-67-1	1-Pentene	2,100	1,300
00563-46-2	2-Methyl-1-butene	5,600	1,300
00109-66-0	n-Pentane	63,000	1,300
00078-79-5	Isoprene	ND	1,300
00646-04-8	trans-2-Pentene	6,900	1,300
00627-20-3	cis-2-Pentene	3,900	1,300
00513-35-9	2-Methyl-2-butene	14,000	1,300

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-1A
PAI Sample ID : P9900998-010

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/11/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.20 ml

Pi 1 = -0.5 Pf 1 = 3.5

D.F. = 1.28

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	7,500	1,300
00142-29-0	Cyclopentene	2,800	1,300
00691-37-2	4-Methyl-1-pentene	3,800	1,300
00287-92-3	Cyclopentane	20,000	1,300
00079-29-8	2,3-Dimethylbutane	34,000	1,300
01634-04-4	Methyl tert-Butyl Ether	3,100	1,300
00107-83-5	2-Methylpentane	180,000	1,300
00096-14-0	3-Methylpentane	140,000	1,300
00592-41-6	1-Hexene	8,900	1,300
00110-54-3	n-Hexane	220,000	1,300
04050-45-7	trans-2-Hexene	19,000	1,300
00625-27-4	2-Methyl-2-pentene	27,000	1,300
07688-21-3	cis-2-Hexene	11,000	1,300
00096-37-7	Methylcyclopentane	170,000	1,300
00108-08-7	2,4-Dimethylpentane	61,000	1,300
00071-43-2	Benzene	220,000	1,300
00110-82-7	Cyclohexane	67,000	1,300
00591-76-4	2-Methylhexane	200,000	1,300
00565-59-3	2,3-Dimethylpentane	140,000	1,300
00589-34-4	3-Methylhexane	210,000	1,300
00592-76-7 00540-84-1	1-Heptene + Isooctane	180,000	1,300
00142-82-5	n-Heptane	200,000	1,300
00108-87-2	Methylcyclohexane	67,000	1,300
00589-43-5	2,4-Dimethylhexane	54,000	1,300
00565-75-3	2,3,4-Trimethylpentane	84,000	1,900

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : BES-1A
PAI Sample ID : P9900998-010

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : 5/11/99
Date Received : 5/18/99
Date Analyzed : 5/27/99
Volume(s) Analyzed : 0.20 ml

Pi 1 = -0.5 Pf 1 = 3.5

D.F. = 1.28

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	960,000	1,900
00592-27-8	2-Methylheptane	81,000	1,900
00111-60-0	1-Octene	12,000	1,900
00111-65-9	n-Octane	54,000	1,900
00100-41-4	Ethylbenzene	99,000	1,900
00108-38-3	m-Xylene	320,000	1,900
00106-42-3	p-Xylene	89,000	1,900
00100-42-5	Styrene	ND	1,900
00095-47-6	o-Xylene	120,000	2,500
00124-11-8	1-Nonene	6,200	2,500
00111-84-2	n-Nonane	6,900	2,500
00098-82-8	Cumene	ND	2,500
07785-70-8	a-Pinene	ND	2,500
00103-65-1	n-Propylbenzene	11,000	2,500
00620-14-4	m-Ethyltoluene	33,000	2,500
00622-96-8	p-Ethyltoluene	17,000	2,500
00108-67-8	1,3,5-Trimethylbenzene	20,000	2,500
00611-14-3	o-Ethyltoluene	12,000	2,500
18172-67-3	b-Pinene	ND	2,500
00095-63-6	1,2,4-Trimethylbenzene	27,000	5,000
00124-18-5	n-Decane	ND	5,000
00099-87-6	p-Cymene	ND	5,000
05989-27-5	d-Limonene	ND	5,000
00105-05-5	1,4-Diethylbenzene	ND	5,000
00104-51-8	n-Butylbenzene	ND	5,000

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : Method Blank
PAI Sample ID : P990526-MB

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : NA
Date Received : NA
Date Analyzed : 5/26/99
Volume(s) Analyzed : 250.0 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	1.3	1.0
00074-86-2	Acetylene	ND	2.0
00074-84-0	Ethane	ND	1.0
00115-07-1	Propylene	ND	1.0
00074-98-6	Propane	ND	1.0
00074-99-7	Methylacetylene	ND	1.0
00075-28-5	Isobutane	ND	1.0
00115-11-7	Isobutylene	ND	1.0
00106-98-9	1-Butene	ND	1.0
00106-99-0	1,3-Butadiene	ND	1.0
00106-97-8	n-Butane	ND	1.0
00624-64-6	trans-2-Butene	ND	1.0
00463-82-1	2,2-Dimethylpropane	ND	1.0
00107-00-6	Ethylacetylene	ND	1.0
00590-18-1	cis-2-Butene	ND	1.0
00078-78-4	Isopentane	ND	1.0
00503-17-3	Dimethylacetylene	ND	1.0
00109-67-1	1-Pentene	ND	1.0
00563-46-2	2-Methyl-1-butene	ND	1.0
00109-66-0	n-Pentane	ND	1.0
00078-79-5	Isoprene	ND	1.0
00646-04-8	trans-2-Pentene	ND	1.0
00627-20-3	cis-2-Pentene	ND	1.0
00513-35-9	2-Methyl-2-butene	ND	1.0

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Performance Analytical Inc.
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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : Method Blank
PAI Sample ID : P990526-MB

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : NA
Date Received : NA
Date Analyzed : 5/26/99
Volume(s) Analyzed : 250.0 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	ND	1.0
00142-29-0	Cyclopentene	ND	1.0
00691-37-2	4-Methyl-1-pentene	ND	1.0
00287-92-3	Cyclopentane	ND	1.0
00079-29-8	2,3-Dimethylbutane	ND	1.0
01634-04-4	Methyl tert-Butyl Ether	ND	1.0
00107-83-5	2-Methylpentane	ND	1.0
00096-14-0	3-Methylpentane	ND	1.0
00592-41-6	1-Hexene	ND	1.0
00110-54-3	n-Hexane	ND	1.0
04050-45-7	trans-2-Hexene	ND	1.0
00625-27-4	2-Methyl-2-pentene	ND	1.0
07688-21-3	cis-2-Hexene	ND	1.0
00096-37-7	Methylcyclopentane	ND	1.0
00108-08-7	2,4-Dimethylpentane	ND	1.0
00071-43-2	Benzene	ND	1.0
00110-82-7	Cyclohexane	ND	1.0
00591-76-4	2-Methylhexane	ND	1.0
00565-59-3	2,3-Dimethylpentane	ND	1.0
00589-34-4	3-Methylhexane	ND	1.0
00592-76-7 00540-84-1	1-Heptene + Isooctane	ND	1.0
00142-82-5	n-Heptane	ND	1.0
00108-87-2	Methylcyclohexane	ND	1.0
00589-43-5	2,4-Dimethylhexane	ND	1.0
00565-75-3	2,3,4-Trimethylpentane	ND	1.5

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Verified By: RG By: 6/2/99

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Performance Analytical Inc.
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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : Method Blank
PAI Sample ID : P990526-MB

Test Code :	Analysis For Ozone Precursors	Date Sampled :	NA
Instrument :	HP GC 6890A/FID/Tekmar 5010	Date Received :	NA
Analyst :	Wade Henton	Date Analyzed :	5/26/99
Matrix :	Summa Canister	Volume(s) Analyzed :	250.0 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	ND	1.5
00592-27-8	2-Methylheptane	ND	1.5
00111-60-0	1-Octene	ND	1.5
00111-65-9	n-Octane	ND	1.5
00100-41-4	Ethylbenzene	ND	1.5
00108-38-3	m-Xylene	ND	1.5
00106-42-3	p-Xylene	ND	1.5
00100-42-5	Styrene	ND	1.5
00095-47-6	o-Xylene	ND	2.0
00124-11-8	1-Nonene	ND	2.0
00111-84-2	n-Nonane	ND	2.0
00098-82-8	Cumene	ND	2.0
07785-70-8	a-Pinene	ND	2.0
00103-65-1	n-Propylbenzene	ND	2.0
00620-14-4	m-Ethyltoluene	ND	2.0
00622-96-8	p-Ethyltoluene	ND	2.0
00108-67-8	1,3,5-Trimethylbenzene	ND	2.0
00611-14-3	o-Ethyltoluene	ND	2.0
18172-67-3	b-Pinene	ND	2.0
00095-63-6	1,2,4-Trimethylbenzene	ND	4.0
00124-18-5	n-Decane	ND	4.0
00099-87-6	p-Cymene	ND	4.0
05989-27-5	d-Limonene	ND	4.0
00105-05-5	1,4-Diethylbenzene	ND	4.0
00104-51-8	n-Butylbenzene	ND	4.0

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RCS By: 6/2/99

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Performance Analytical Inc.
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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : Method Blank
PAI Sample ID : P990527-MB

Test Code :	Analysis For Ozone Precursors	Date Sampled :	NA
Instrument :	HP GC 6890A/FID/Tekmar 5010	Date Received :	NA
Analyst :	Wade Henton	Date Analyzed :	5/27/99
Matrix :	Summa Canister	Volume(s) Analyzed :	250.0 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00074-85-1	Ethylene	ND	1.0
00074-86-2	Acetylene	ND	2.0
00074-84-0	Ethane	ND	1.0
00115-07-1	Propylene	ND	1.0
00074-98-6	Propane	ND	1.0
00074-99-7	Methylacetylene	ND	1.0
00075-28-5	Isobutane	ND	1.0
00115-11-7	Isobutylene	ND	1.0
00106-98-9	1-Butene	ND	1.0
00106-99-0	1,3-Butadiene	ND	1.0
00106-97-8	n-Butane	ND	1.0
00624-64-6	trans-2-Butene	ND	1.0
00463-82-1	2,2-Dimethylpropane	ND	1.0
00107-00-6	Ethylacetylene	ND	1.0
00590-18-1	cis-2-Butene	ND	1.0
00078-78-4	Isopentane	ND	1.0
00503-17-3	Dimethylacetylene	ND	1.0
00109-67-1	1-Pentene	ND	1.0
00563-46-2	2-Methyl-1-butene	ND	1.0
00109-66-0	n-Pentane	ND	1.0
00078-79-5	Isoprene	ND	1.0
00646-04-8	trans-2-Pentene	ND	1.0
00627-20-3	cis-2-Pentene	ND	1.0
00513-35-9	2-Methyl-2-butene	ND	1.0

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ND = Not Detected

Verified By: RC By: 6/2/99

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Performance Analytical Inc.
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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : Method Blank
PAI Sample ID : P990527-MB

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : NA
Date Received : NA
Date Analyzed : 5/27/99
Volume(s) Analyzed : 250.0 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00075-83-2	2,2-Dimethylbutane	ND	1.0
00142-29-0	Cyclopentene	ND	1.0
00691-37-2	4-Methyl-1-pentene	ND	1.0
00287-92-3	Cyclopentane	ND	1.0
00079-29-8	2,3-Dimethylbutane	ND	1.0
01634-04-4	Methyl tert-Butyl Ether	ND	1.0
00107-83-5	2-Methylpentane	ND	1.0
00096-14-0	3-Methylpentane	ND	1.0
00592-41-6	1-Hexene	ND	1.0
00110-54-3	n-Hexane	ND	1.0
04050-45-7	trans-2-Hexene	ND	1.0
00625-27-4	2-Methyl-2-pentene	ND	1.0
07688-21-3	cis-2-Hexene	ND	1.0
00096-37-7	Methylcyclopentane	ND	1.0
00108-08-7	2,4-Dimethylpentane	ND	1.0
00071-43-2	Benzene	ND	1.0
00110-82-7	Cyclohexane	ND	1.0
00591-76-4	2-Methylhexane	ND	1.0
00565-59-3	2,3-Dimethylpentane	ND	1.0
00589-34-4	3-Methylhexane	ND	1.0
00592-76-7 00540-84-1	1-Heptene + Isooctane	ND	1.0
00142-82-5	n-Heptane	ND	1.0
00108-87-2	Methylcyclohexane	ND	1.0
00589-43-5	2,4-Dimethylhexane	ND	1.0
00565-75-3	2,3,4-Trimethylpentane	ND	1.5

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RESULTS OF ANALYSIS

Client : Time Oil Company

Client Sample ID : Method Blank
PAI Sample ID : P990527-MB

Test Code : Analysis For Ozone Precursors
Instrument : HP GC 6890A/FID/Tekmar 5010
Analyst : Wade Henton
Matrix : Summa Canister

Date Sampled : NA
Date Received : NA
Date Analyzed : 5/27/99
Volume(s) Analyzed : 250.0 ml

Pi 1 = 0.0 Pf 1 = 0.0

D.F. = 1.00

CAS #	COMPOUND	RESULT ppbv	REPORTING LIMIT ppbv
00108-88-3	Toluene	ND	1.5
00592-27-8	2-Methylheptane	ND	1.5
00111-60-0	1-Octene	ND	1.5
00111-65-9	n-Octane	ND	1.5
00100-41-4	Ethylbenzene	ND	1.5
00108-38-3	m-Xylene	ND	1.5
00106-42-3	p-Xylene	ND	1.5
00100-42-5	Styrene	ND	1.5
00095-47-6	o-Xylene	ND	2.0
00124-11-8	1-Nonene	ND	2.0
00111-84-2	n-Nonane	ND	2.0
00098-82-8	Cumene	ND	2.0
07785-70-8	a-Pinene	ND	2.0
00103-65-1	n-Propylbenzene	ND	2.0
00620-14-4	m-Ethyltoluene	ND	2.0
00622-96-8	p-Ethyltoluene	ND	2.0
00108-67-8	1,3,5-Trimethylbenzene	ND	2.0
00611-14-3	o-Ethyltoluene	ND	2.0
18172-67-3	b-Pinene	ND	2.0
00095-63-6	1,2,4-Trimethylbenzene	ND	4.0
00124-18-5	n-Decane	ND	4.0
00099-87-6	p-Cymene	ND	4.0
05989-27-5	d-Limonene	ND	4.0
00105-05-5	1,4-Diethylbenzene	ND	4.0
00104-51-8	n-Butylbenzene	ND	4.0

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RG By: 6/2 RG

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Performance Analytical Inc.
Air Quality Laboratory
A Division of Columbia Analytical Services, Inc.
An Employee Owned Company

RESULTS OF TOTAL NON-METHANE HYDROCARBONS ANALYSIS

Client: Time Oil Company

Client Project ID: Time Oil Property 01-068/9904808.100
PAI Project ID: P9900998

Test Code: Analysis For Ozone Precursors
Instrument ID: HP GC 6890A/FID/Tekmar 5010
Analyst: Wade Henton
Matrix: Summa Canister(s)

Date Sampled: 5/10-14/99
Date Received: 5/18/99
Date Analyzed: 5/26-27/99
Volume(s) Analyzed: 250.00 ml
10.0, 1.0, 0.50, 0.20, 0.10 ml

Client Sample ID	PAI Sample ID	D.F.	Total Non-Methane Hydrocarbons Concentration in ppmC, v/v	
			Result	Reporting Limit
BES-1B	P9900998-001	1.25	71,000	630
VET-1B	P9900998-002	1.39	10,000	130
BES-3B	P9900998-003	1.31	17,000	250
BES-3A	P9900998-004	1.29	22,000	250
SVES-1B	P9900998-005	1.26	7,400	130
SVES-1A	P9900998-006	1.26	320	13
VET-1A	P9900998-007	1.38	6,000	130
BES-2B	P9900998-008	1.30	21,000	250
BES-2A	P9900998-009	1.26	78,000	1,300
BES-1A	P9900998-010	1.28	40,000	630
Method Blank	P990526-MB	1.00	ND	0.50
Method Blank	P990527-MB	1.00	ND	0.50

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified By: RCS Date: 6/2/99

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Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Chain of Custody Record
Analytical Services Request

Client / Address: Maxim Technologies, 10220 N Nevada Suite 220, Spokane Wa 99218

Phone 509-465-2188 Fax 509-465-2199

PAI Project No. P9900998

Client Project Name / Location: Time Oil Property 01-068 / Sunnyside Washington

Client Project No. 9904808.100

Contact: ERIC POLZIN

Sampler (Signature): [signature]

P. O. No.

ANALYSES: NMHC & Hydrocarbon Speciation by EPA TO-12 & TO-14

Remarks: Bill to Time Oil Co, Attn. Scott Sloan

Client Sample ID	Date Collected	Time Collected	Lab Sample No.	Type of Sample	Container ID (Serial#)	Regulator ID (Serial#)	NMHC & Hydrocarbon Speciation by EPA TO-12 & TO-14				Expected Turnaround Time	Remarks
BES-1B	5/11/99	1255	-001	A	566		X					
VET-1B	5/10/99	1605	-002	A	563		X				STANDARD	
BES-3B	5/13/99	1625	-003	A	560		X					
BES-3A	5/12/99	1655	-004	A	561		X					
SVES-1B	5/14/99	2030	-005	A	346		X					
SVES-1A	5/14/99	1610	-006	A	344		X					
VET-1A	5/10/99	1515	-007	A	562		X					
BES-2B	5/12/99	1605	-008	A	567		X					
BES-2A	5/11/99	1315	-009	A	565		X					
BES-1A	5/11/99	1210	-010	A	564		X					

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	5/17/99	1500	AIRBORNE		
Relinquished by: (Signature)	Date	Time	Received by: (Signature) [signature]	5/18/99	1100
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

White Copy : Accompanies Sampler   Yellow Copy : Sampler

APPENDIX E

AIR SPARGE PILOT TEST DATA

TABLE E-1
Summary of Groundwater Parameters - Pre & Post Test
Time Oil Property # 01-068
Sunnyside, WA

Well number	Date m/d/y	Thicknesss of Product (feet)	Depth to Water feet	D.O. mg/L	Temp deg.C	pH	Conductivity uS
MW-1	5/10/99	-	13.01	0.75	-	8.50	320
MW-1	5/11/99	-	13.01	0.73	16.4	8.50	310
MW-1	5/14/99	-	12.93	0.43	16.4	8.3	300
MW-2	5/10/99	-	15.56	2.39	-	7.80	490
MW-2	5/11/99	-	15.59	2.67	16.7	7.80	480
MW-2	5/14/99	-	15.50	2.49	16.8	7.6	460
MW-3	5/10/99	0	14.47	0.75	-	7.20	780
MW-3	5/11/99	0	14.67	0.50	16.2	7.20	800
MW-3	5/14/99	0	14.67	0.22	16	7	690
MW-4	5/10/99	0	17.52	0.77	-	7.20	1120
MW-4	5/11/99	0	17.82	1.35	16.9	7.20	1100
MW-4	5/14/99	17.78	17.87	-	-	-	-
MW-5	5/10/99	0	17.78	0.35	-	7.40	860
MW-5	5/11/99	<0.01	17.47	-	-	-	-
MW-5	5/14/99	17.86	18.20	-	-	-	-
MW-6	5/10/99	<0.01	18.83	-	-	-	-
MW-6	5/11/99	0.03	19.13	-	-	-	-
MW-6	5/14/99	19.17	19.37	-	-	-	-
MW-7	5/10/99	0	19.94	3.62	-	7.80	450
MW-7	5/11/99	0	19.94	2.85	16.9	7.80	520
MW-7	5/14/99	0	19.00	2.24	16.6	7.6	490
MW-8	5/10/99	-	20.58	0.80	-	7.70	620
MW-8	5/11/99	-	20.58	0.86	17.0	7.90	680
MW-8	5/14/99	-	20.81	1.71	16.7	7.6	640
MW-9	5/10/99	1.73	20.87	-	-	-	-
MW-9	5/11/99	1.74	20.88	-	-	-	-
MW-9	5/14/99	0	22.48	0.22	17.3	7.4	740
MW-10	5/10/99	-	20.15	2.62	-	7.60	1060
MW-10	5/11/99	-	20.15	2.67	16.3	7.60	1160
MW-10	5/14/99	-	20.18	3.21	15.9	7.5	1060
MW-11	5/10/99	-	20.39	4.52	-	7.50	810
MW-11	5/11/99	-	20.39	4.17	16.2	7.60	870
MW-11	5/14/99	-	20.42	3.95	15.4	7.5	850
MW-12	5/10/99	-	19.57	3.55	-	7.40	850
MW-12	5/11/99	-	19.57	5.52	15.0	7.50	900
MW-12	5/14/99	-	19.61	5.73	14.4	7.2	860
MW-13	5/10/99	1.96	19.87	-	-	-	-
MW-13	5/11/99	1.99	19.87	-	-	-	-
MW-13	5/14/99	21.65	21.91	-	-	-	-
MW-14	5/10/99	0	20.77	0.67	-	7.50	930
MW-14	5/11/99	0	20.76	0.65	16.8	7.60	1050
MW-14	5/14/99	0	21.19	3.29	16.9	7.5	1060
MW-15	5/10/99	-	20.90	0.48	-	7.30	200
MW-15	5/11/99	-	20.93	0.49	16.8	7.50	1320
MW-15	5/14/99	-	21.14	0.9	16.8	7.2	1390
MW-16	5/10/99	-	17.53	0.63	-	7.30	910
MW-16	5/11/99	-	17.92	0.75	16.9	7.40	940
MW-16	5/14/99	-	17.87	0.21	17.2	7	870

Table E-2
Summary of Groundwater Monitoring Data
Sparge Data
Time Oil Property # 01-068
Sunnyside, WA
5/14/99
Start Time 1600

MW-16								System	
Time Since Start	Time	DTW	DO2	Temp	Cond	pH	Vac/Press	PSI	Flow
	1548	17.78							
3	1603	17.79						5	0
5	1605	17.76						10	0
9	1609	17.66						15	0
13	1613	17.51							
15	1615	17.46							
19	1619	17.27	2.15	17.5	890	7.1		15	0
27	1627	17.05							
30	1630	16.91							
33	1633	16.82							
35	1635	16.74					-0.02	15	0
40	1640	16.59						15	0
42	1642	16.55	1.96	17.4	890	7.2			
45	1645	16.53							
50	1650	16.35						15	0
55	1655	16.19							
60	1700	16.07						15	~1
70	1710	15.85	2.15	17.3	880	7.1		15	~1
75	1715	15.87							
80	1720	15.68							
90	1730	15.51						15	~1
95	1735	15.43							
100	1740	15.37							
105	1745	15.30	1.97	17.3	890	7.1		15	~1
115	1750	15.25							
125	1800	15.12							
135	1810	15.04							
145	1820	14.96							
153	1833	14.90							
160	1840	14.82							
170	1850	14.96							
180	1900	15.06							
190	1910	15.05							
200	1920	15.03	2.34	17.2	910	7.2		15	~1
210	1930	15.00							
220	1940	14.97							
230	1950	14.96	2.56	17.2				15	~1.5
240	2000	14.94	2.5	17.1					
250	2010	14.91	2.52	17.1					<2(1.5-2)
230	2020	14.90	2.53	17.1	890	7.3			
270	2030	14.90	2.69	17.1	910	7.3			
282	2042	15.03	3.13	17.00	890	7.3			
306	2106	16.05	3.42	17.00	890	7.2			
319	2153	17.89	3.72	17.00	910	7.3			

Air Sparge test shut down at 2030

Table E-3
Summary of Groundwater Monitoring Data
Sparge Data
Time Oil Property # 01-068
Sunnyside, WA
5/14/99
Start Time 1600

MW-2						
Time Since Start	Time	DTW	DO2	Temp	Cond	pH
	1547	16.11				
11	1611	15.56	5.69	17.00	440	7.4
28	1628	15.44	4.71	16.90	450	7.5
43	1643	15.33				
62	1702	15.27	4.20	17.10	440	7.6
78	1718	15.21				
91	1731	15.14	4.32	17.10	440	7.6
113	1753	15.11				
131	1811	15.05	4.28	17.00	430	7.6
152	1832	15.02				
179	1906	15.02	4.16	17.00	440	7.6
206	1933	14.92				
250	2017	14.88	3.98	17.00	450	7.6
290	2057	14.91	3.89	17.00	430	7.6
419	2206	15.37	4.80	17.00	450	7.6

Table E-4
Summary of Groundwater Monitoring Data
Sparge Data
Time Oil Property # 01-068
Sunnyside, WA
5/14/99
Start Time 1600

MW-3						
Time Since Start	Time	DTW	DO2	Temp	Cond	pH
	1543	14.81				
5	1605	14.66	0.31	16.30	610	6.9
24	1624	14.35	0.28	16.30	610	7
43	1643	13.95				
57	1657	13.82	0.25	16.30	600	7.1
76	1716	13.66				
87	1727	13.59	0.25	16.20	580	7.1
110	1750	13.42				
122	1802	13.36	0.23	16.20	590	7.1
150	1830	13.26				
177	1857	13.17	0.18	16.20	600	7.1
204	1930	13.10				
238	2004	13.05	0.18	16.20	560	7.2
284	2050	13.18	0.20	16.10	560	7.2
402	2158	14.68	0.22	16.10	570	7.2

Table E-5
Summary of Groundwater Monitoring Data
Sparge Data
Time Oil Property # 01-068
Sunnyside, WA
5/14/99
Start Time 1600

MW-7						
Time Since Start	Time	DTW	DO2	Temp	Cond	pH
	1507	19.94				
15	1615	19.95	2.80	17.20	480	7.5
38	1638	19.96	2.38	17.20	480	7.6
52	1652	20.00				
58	1706	19.96	2.67	17.20	480	7.6
78	1720	19.97				
98	1740	19.96	2.54	17.20	470	7.7
112	1754	19.95				
151	1815	19.93	2.56	17.10	480	7.6
170	1834	19.91				
206	1910	19.91	2.60	17.00	470	7.6
230	1934	19.91				
267	2037	19.92	2.62	17.00	470	7.6
292	2102	19.91	2.80	17.00	480	7.7
364	2214	19.91	2.58	17.00	470	7.6

Table E-6
Summary of Groundwater Monitoring Data
Sparge Data
Time Oil Property # 01-068
Sunnyside, WA
5/14/99
Start Time 1600

MW-4			
Time Since Start	Time	DTW	DTP
	1541	17.68	NP
41	1641	17.07	NP
83	1723	16.66	NP
117	1757	16.44	NP
161	1842	16.26	NP
288	1925	15.98	NP
476	2233	17.90	<0.01

MW-5			
Time Since Start	Time	DTW	DTP
	1540	17.91	NP
42	1642	17.87	NP
84	1724	17.78	NP
116	1756	17.73	NP
156	1837	17.67	NP
290	1927	17.70	NP
478	2235	17.77	<0.01

Table E-7
Summary of Groundwater Monitoring Data
Sparge Data
Time Oil Property # 01-068
Sunnyside, WA
5/14/99
Start Time 1600

MW-6			
Time Since Start	Time	DTW	DTP
	1503	19.37	19.16
54	1654	19.38	19.17
133	1835	19.17	19.15
186	1928	19.14	NP
383	2245	19.14	19.13

MW-1						
Time Since Start	Time	DTW	DO2	Temp	Cond	pH
	1546	12.92				
34	1634	12.92	0.52	16.50	290	8.2
77	1717	12.91				
111	1751	12.90				
125	1805	12.88	0.55	16.40	290	8.3
151	1831	12.90				
181	1901	12.84	0.46	16.40	290	8.3
211	1931	12.86				
258	2018	12.86	0.44	16.40	290	8.3
293	2053	12.85	0.45	16.40	300	8.4
359	2203	12.90	0.53	16.30	300	8.2

APPENDIX F

ANALYTICAL TEST CERTIFICATES - GROUNDWATER

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Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled:	5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received:	5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	6/1/99 14:03

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-2	B905296-01	Water	5/14/99
MW-3	B905296-02	Water	5/14/99
MW-16	B905296-03	Water	5/14/99
SW-1	B905296-04	Water	5/14/99
MW-9	B905296-05	Water	5/14/99
MW-8	B905296-06	Water	5/14/99
MW-15	B905296-07	Water	5/14/99
MW-14	B905296-08	Water	5/14/99
MW-10	B905296-09	Water	5/14/99
MW-10	B905296-10	Water	5/11/99
MW-8	B905296-11	Water	5/11/99
MW-14	B905296-12	Water	5/11/99
MW-15	B905296-13	Water	5/14/99
WHC Production Well	B905296-14	Water	5/11/99

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Joy B Chang, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-2			B905296-01				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*102*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*99.6*	"	
MW-3			B905296-02				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		50.0	**1120**	ug/l	
Benzene	"	"	"		0.500	**32.3**	"	
Toluene	"	"	"		0.500	**27.6**	"	
Ethylbenzene	"	"	"		0.500	**25.5**	"	
Xylenes (total)	"	"	"		1.00	**206**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*108*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*98.5*	"	
MW-16			B905296-03				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		25000	**110000**	ug/l	
Benzene	"	"	"		250	**21700**	"	
Toluene	"	"	"		250	**22000**	"	
Ethylbenzene	"	"	"		250	**1300**	"	
Xylenes (total)	"	"	"		500	**11900**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*103*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*98.1*	"	
SW-1			B905296-04				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		50.0	**739**	ug/l	
Benzene	"	"	"		0.500	**31.6**	"	
Toluene	"	"	"		0.500	**83.8**	"	
Ethylbenzene	"	"	"		0.500	**17.8**	"	
Xylenes (total)	"	"	"		1.00	**93.0**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*110*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*103*	"	
MW-9			B905296-05				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		5000	**106000**	ug/l	
Benzene	"	"	"		250	**11700**	"	

North Creek Analytical - Bothell

**Refer to end of report for text of notes and definitions.*

Joy B Chang, Project Manager

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503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-9 (continued)			**B905296-05**				**Water**	
Toluene	0590586	5/25/99	5/26/99		250	**7470**	ug/l	
Ethylbenzene	"	"	"		50.0	**1060**	"	
Xylenes (total)	"	"	"		100	**9240**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*108*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*94.2*	"	
MW-8			**B905296-06**				**Water**	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	**2.45**	"	
Toluene	"	"	"		0.500	**3.43**	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	**2.31**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*96.9*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*99.4*	"	
MW-15			**B905296-07**				**Water**	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/27/99		125	ND	ug/l	1,2
Benzene	"	"	"		1.25	**137**	"	
Toluene	"	"	"		1.25	ND	"	
Ethylbenzene	"	"	"		1.25	ND	"	
Xylenes (total)	"	"	"		2.50	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*112*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*103*	"	
MW-14			**B905296-08**				**Water**	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		50.0	**1270**	ug/l	1
Benzene	"	"	5/27/99		25.0	**2330**	"	
Toluene	"	"	5/26/99		0.500	**52.9**	"	
Ethylbenzene	"	"	"		0.500	**3.59**	"	
Xylenes (total)	"	"	"		1.00	**45.6**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*143*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*63.8*	"	
MW-10			**B905296-09**				**Water**	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		50.0	ND	ug/l	
Benzene	"	"	"		0.520	ND	"	3
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-10 (continued)			B905296-09				Water	
Xylenes (total)	0590586	5/25/99	5/26/99		1.00	ND	ug/l	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*102*	%	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*101*	"	
MW-10			B905296-10				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/25/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	**1.07**	"	
Ethylbenzene	"	"	"		0.500	**0.653**	"	
Xylenes (total)	"	"	"		1.00	**4.74**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*108*	%	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*103*	"	
MW-8			B905296-11				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/25/99		50.0	**69.5**	ug/l	
Benzene	"	"	"		0.500	**0.882**	"	
Toluene	"	"	"		0.500	**2.93**	"	
Ethylbenzene	"	"	"		0.500	**1.11**	"	
Xylenes (total)	"	"	"		1.00	**8.65**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*108*	%	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*103*	"	
MW-14			B905296-12				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/25/99		50.0	**834**	ug/l	1
Benzene	"	"	"		25.0	**1340**	"	
Toluene	"	"	"		0.500	**26.1**	"	
Ethylbenzene	"	"	"		0.500	**4.90**	"	
Xylenes (total)	"	"	"		1.00	**26.7**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*72.7*	%	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*76.5*	"	
MW-15			B905296-13				Water	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/26/99		1000	ND	ug/l	2
Benzene	"	"	"		10.0	**307**	"	
Toluene	"	"	"		10.0	ND	"	
Ethylbenzene	"	"	"		10.0	ND	"	
Xylenes (total)	"	"	"		20.0	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*109*	%	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-15 (continued)			**B905296-13**				**Water**	
Surrogate: 4-BFB (PID)	*0590586*	*5/25/99*	*5/26/99*	*50.0-150*		*104*	*%*	
WHC Production Well			**B905296-14**				**Water**	
Gasoline Range Hydrocarbons	0590586	5/25/99	5/25/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*103*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*101*	"	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Dissolved Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
MW-2			**B905296-01**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**44.0**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**16.0**	"	
Arsenic	0590451	5/18/99	5/18/99	EPA 6020	0.00100	**0.0230**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00339**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	"	EPA 6020	0.00100	ND	"	
Zinc	"	"	"	EPA 6020	0.0100	ND	"	
MW-3			**B905296-02**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**80.8**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**28.1**	"	
Arsenic	0590451	5/18/99	5/18/99	EPA 6020	0.00100	**0.00418**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00410**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	"	EPA 6020	0.00500	**1.16**	"	
Zinc	"	"	"	EPA 6020	0.0100	ND	"	
MW-16			**B905296-03**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**99.3**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**41.5**	"	
Arsenic	0590451	5/18/99	5/18/99	EPA 6020	0.00100	**0.00965**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00622**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	"	EPA 6020	0.0100	**3.28**	"	
Zinc	"	"	"	EPA 6020	0.0100	ND	"	
SW-1			**B905296-04**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**61.4**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**20.0**	"	
Arsenic	0590451	5/18/99	5/18/99	EPA 6020	0.00100	**0.0116**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00271**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	"	EPA 6020	0.00100	**0.195**	"	
Zinc	"	"	"	EPA 6020	0.0100	ND	"	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590586	**Date Prepared: 5/25/99**					**Extraction Method: EPA 5030B (MeOH)**				
Blank	**0590586-BLK2**									
Gasoline Range Hydrocarbons	5/26/99			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**1.00**				
Surrogate: 4-BFB (FID)	"	*48.0*		*36.4*	"	*50.0-150*	*75.8*			
Surrogate: 4-BFB (PID)	"	*48.0*		*40.3*	"	*50.0-150*	*84.0*			
Blank	**0590586-BLK3**									
Gasoline Range Hydrocarbons	5/26/99			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**1.00**				
Surrogate: 4-BFB (FID)	"	*48.0*		*48.6*	"	*50.0-150*	*101*			
Surrogate: 4-BFB (PID)	"	*48.0*		*48.4*	"	*50.0-150*	*101*			
Blank	**0590586-BLK4**									
Gasoline Range Hydrocarbons	5/27/99			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**1.00**				
Surrogate: 4-BFB (FID)	"	*48.0*		*47.3*	"	*50.0-150*	*98.5*			
Surrogate: 4-BFB (PID)	"	*48.0*		*48.2*	"	*50.0-150*	*100*			
LCS	**0590586-BS1**									
Gasoline Range Hydrocarbons	5/25/99	500		500	ug/l	70.0-130	100			
Surrogate: 4-BFB (FID)	"	*48.0*		*50.3*	"	*50.0-150*	*105*			
Duplicate	**0590586-DUP1**	**B905296-12**								
Gasoline Range Hydrocarbons	5/25/99		834	839	ug/l			25.0	**0.598**	
Surrogate: 4-BFB (FID)	"	*48.0*		*34.9*	"	*50.0-150*	*72.7*			
Duplicate	**0590586-DUP2**	**B905296-07**								
Gasoline Range Hydrocarbons	5/26/99		ND	76.2	ug/l			25.0		
Surrogate: 4-BFB (FID)	"	*48.0*		*62.4*	"	*50.0-150*	*130*			

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike	**0590586-MS1**		**B905296-14**							
Benzene	5/26/99	10.0	ND	8.64	ug/l	70.0-130	**86.4**			
Toluene	"	10.0	ND	9.12	"	70.0-130	**91.2**			
Ethylbenzene	"	10.0	ND	9.41	"	70.0-130	**94.1**			
Xylenes (total)	"	30.0	ND	27.4	"	70.0-130	**91.3**			
Surrogate: 4-BFB (PID)	"	*48.0*		*48.0*	"	*50.0-150*	*100*			
Matrix Spike Dup	**0590586-MSD1**		**B905296-14**							
Benzene	5/26/99	10.0	ND	8.99	ug/l	70.0-130	**89.9**	15.0	**3.97**	
Toluene	"	10.0	ND	9.56	"	70.0-130	**95.6**	15.0	**4.71**	
Ethylbenzene	"	10.0	ND	9.84	"	70.0-130	**98.4**	15.0	**4.47**	
Xylenes (total)	"	30.0	ND	28.9	"	70.0-130	**96.3**	15.0	**5.33**	
Surrogate: 4-BFB (PID)	"	*48.0*		*49.5*	"	*50.0-150*	*103*			

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Dissolved Metals by EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590451	**Date Prepared: 5/18/99**					**Extraction Method: EPA 3005A**				
Blank	**0590451-BLK1**									
Arsenic	5/18/99			**ND**	mg/l	**0.00100**				
Chromium	"			**ND**	"	**0.00100**				
Lead	"			**ND**	"	**0.00100**				
Manganese	"			**ND**	"	**0.00100**				
Zinc	"			**ND**	"	**0.0100**				
LCS	**0590451-BS1**									
Arsenic	5/18/99	0.200		0.202	mg/l	80.0-120	101			
Chromium	"	0.200		0.207	"	80.0-120	103			
Lead	"	0.200		0.208	"	80.0-120	104			
Manganese	"	0.200		0.210	"	80.0-120	105			
Zinc	"	0.200		0.202	"	80.0-120	101			
Matrix Spike	**0590451-MS1**		**B905296-01**							
Arsenic	5/18/99	0.100	0.0230	0.136	mg/l	75.0-125	**113**			
Chromium	"	0.100	0.00339	0.0982	"	75.0-125	**94.8**			
Lead	"	0.100	ND	0.106	"	75.0-125	**106**			
Manganese	"	0.100	ND	0.109	"	75.0-125	**109**			
Zinc	"	0.100	ND	0.0947	"	75.0-125	**94.7**			
Matrix Spike Dup	**0590451-MSD1**		**B905296-01**							
Arsenic	5/18/99	0.100	0.0230	0.139	mg/l	75.0-125	**116**	20.0	**2.62**	
Chromium	"	0.100	0.00339	0.0978	"	75.0-125	**94.4**	20.0	**0.423**	
Lead	"	0.100	ND	0.107	"	75.0-125	**107**	20.0	**0.939**	
Manganese	"	0.100	ND	0.109	"	75.0-125	**109**	20.0	**0**	
Zinc	"	0.100	ND	0.0954	"	75.0-125	**95.4**	20.0	**0.736**	
Batch: 0590546	**Date Prepared: 5/20/99**					**Extraction Method: EPA 3005A**				
Blank	**0590546-BLK1**									
Calcium	5/20/99			**ND**	mg/l	**0.250**				
Iron	"			**ND**	"	**0.150**				
Magnesium	"			**ND**	"	**0.100**				
Blank	**0590546-BLK2**									
Calcium	5/20/99			**ND**	mg/l	**0.250**				
Iron	"			**ND**	"	**0.150**				
Magnesium	"			**ND**	"	**0.100**				

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received: 5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 14:03

Dissolved Metals by EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
LCS	0590546-BS1									
Calcium	5/20/99	1.00		1.10	mg/l	80.0-120	110			
Iron	"	1.00		1.06	"	80.0-120	106			
Magnesium	"	1.00		1.09	"	80.0-120	109			
Matrix Spike	0590546-MS1		B905296-01							
Calcium	5/20/99	1.00	44.0	48.1	mg/l	80.0-120	**NR**			4
Iron	"	1.00	ND	1.04	"	80.0-120	**104**			
Magnesium	"	1.00	16.0	17.9	"	80.0-120	**190**			4
Matrix Spike Dup	0590546-MSD1		B905296-01							
Calcium	5/20/99	1.00	44.0	48.0	mg/l	80.0-120	**NR**	20.0	**2.47**	4
Iron	"	1.00	ND	1.02	"	80.0-120	**102**	20.0	**1.94**	
Magnesium	"	1.00	16.0	18.1	"	80.0-120	**NR**	20.0	**10.0**	4

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled:	5/11/99 to 5/14/99
N. 10220 Nevada Street, Suite 290	Project Number:	Not Provided	Received:	5/14/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	6/1/99 14:03

Notes and Definitions

#	Note
1	This sample contains other compounds not identified as Benzene, Toluene, Ethylbenzene or Xylene. Quantitation and identification by EPA method 8260 is recommended.
2	Sample was analyzed at a dilution due to a high Benzene concentration present in the sample.
3	The reporting limit for this analyte has been raised to account for interference from coeluting organic compounds present in the sample.
4	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery

NORTH CREEK ANALYTICAL
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CHAIN OF CUSTODY REPORT

Work Order # B905296

REPORT TO:	INVOICE TO:
ATTENTION: ERIC POLZIN	ATTENTION: ~~Gene Stec~~ Scott Sloan
ADDRESS: 10220 N Nevada Suite 290 Spokane Wa 99218	ADDRESS: Time Oil Co.
PHONE: 509-465-2188 FAX:	P.O. NUMBER: NCA QUOTE #:
PROJECT NAME: Sunnyside Time Oil	
PROJECT NUMBER:	
SAMPLED BY: ERIC POLZIN/MARK E.	

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: 10 Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day

Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | 1 | Same Day

OTHER Specify:

* Turnaround Requests less than standard may incur Rush Charges.

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: NWTPH-G	BTEX	Dissolved Metals Cd, As, Cr, Pb	Hydrocarbon ID	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW-2	5-14-99 0915		X	X	X		W	3	B905296-01
2.	MW-3	5-14-99 0920		X	X	X		W	3	-02
3.	MW-16	5-14-99 0910		X	X	X		W	3	-03
4.	SW-1	5-14-99 0955		X	X	X		W	3	-04
5.	MW-9	5-14-99 0920		X	X			W	2	-05
6.	MW-8	5-14-99 0910		X	X			W	2	-06
7.	MW-15	5-14-99 0917		X	X			W	2	-07
8.	MW-14	5-14-99 0915		X	X			W	2	-08
9.	MW-10	5-14-99 0900		X	X			W	2	-09
10.	MW-10	5-11-99 1040		X	X			W	2	-10

RELINQUISHED BY (Signature): Eric Polzin	DATE: 5-14-99	RECEIVED BY (Signature): Scott Overdick	DATE: 5-14-99
PRINT NAME: ERIC POLZIN	FIRM: Maxim	TIME: 1025	PRINT NAME: Scott Overdick	FIRM: GEI	TIME: 1025
RELINQUISHED BY (Signature): Scott Overdick	DATE: 5-14-99	RECEIVED BY (Signature):	DATE: 5-14-
PRINT NAME: Scott Overdick	FIRM: GEI	TIME: 1645	PRINT NAME: M. Hutchinson	FIRM: NCA	TIME: 1645

ADDITIONAL REMARKS: Metals Samples not Field Filtered. Need lab Filtering as needed

W/O 14.2

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CHAIN OF CUSTODY REPORT

Work Order # B905296

REPORT TO:	INVOICE TO:
ATTENTION: Eric Polzin	ATTENTION: Scott Sloan
ADDRESS: 10220 N Nevada Suite 290 Spokane Wa 99218	ADDRESS: Time Oil Co
PHONE: 509-465-2190 FAX: 2199	P.O. NUMBER: NCA QUOTE #:
PROJECT NAME: Sunnyside Time Oil	
PROJECT NUMBER:	
SAMPLED BY: Eric Polzin / Mark E	

TURNAROUND REQUEST in Business Days *

Organic & Inorganic Analyses: [10 Standard] [7] [5] [4] [3] [2] [1] [Same Day]

Fuels & Hydrocarbon Analyses: [5 Standard] [3-4] [2] [1] [Same Day]

[OTHER] Specify:

* *Turnaround Requests less than standard may incur Rush Charges.*

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: NWTPH-G	BTEX	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW-8	5-11-99 1035		X	X	W	2	B905296-01
2.	MW-14	5-11-99 1047		X	X	W	2	-02
3.	MW-15	5-11-99 1055		X	X	W	2	-03
4.	WHC Production Well	5-11-99 1115		X	X	W	2	-04
5.								
6.								
7.								
8.								
9.								
10.								

RELINQUISHED BY (Signature): Eric Polzin		DATE: 5-14-99	RECEIVED BY (Signature): Scot Overdick		DATE: 5-14-99
PRINT NAME: Eric J Polzin	FIRM: Maxim	TIME: 1025	PRINT NAME: Scot Overdick	FIRM: GET	TIME: 1025
RELINQUISHED BY (Signature): Scot Overdick		DATE: 5-14-99	RECEIVED BY (Signature): M. Hutchinson		DATE: 5-14-99
PRINT NAME: Scot Overdick	FIRM: GET	TIME: 1645	PRINT NAME: M. Hutchinson	FIRM: NCA	TIME: 1645

ADDITIONAL REMARKS:

W/O 14.2

PAGE 2 OF 2

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled:	5/20/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received:	5/22/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	6/1/99 13:15

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
WHC Production Well	B905422-01	Water	5/20/99

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Joy B Chang, Project Manager

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/20/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/22/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 13:15

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
WHC Production Well			**B905422-01**				**Water**	
Gasoline Range Hydrocarbons	0590742	5/27/99	5/27/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*95.0*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*99.4*	"	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/20/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/22/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 13:15

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590742	**Date Prepared: 5/27/99**					**Extraction Method: EPA 5030B (P/T)**				
Blank	**0590742-BLK1**									
Gasoline Range Hydrocarbons	5/27/99			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**1.00**				
Surrogate: 4-BFB (FID)	"	*48.0*		*42.3*	"	*50.0-150*	*88.1*			
Surrogate: 4-BFB (PID)	"	*48.0*		*46.8*	"	*50.0-150*	*97.5*			
LCS	**0590742-BS1**									
Gasoline Range Hydrocarbons	5/27/99	500		488	ug/l	70.0-130	97.6			
Surrogate: 4-BFB (FID)	"	*48.0*		*46.8*	"	*50.0-150*	*97.5*			
Duplicate	**0590742-DUP1**		**B905440-10**							
Gasoline Range Hydrocarbons	5/27/99		8580	6720	ug/l			25.0	**24.3**	
Surrogate: 4-BFB (FID)	"	*48.0*		*77.4*	"	*50.0-150*	*161*			*1*
Duplicate	**0590742-DUP2**		**B905398-02**							
Gasoline Range Hydrocarbons	5/28/99		1310	1490	ug/l			25.0	**12.9**	
Surrogate: 4-BFB (FID)	"	*48.0*		*46.8*	"	*50.0-150*	*97.5*			
Matrix Spike	**0590742-MS1**		**B905440-07**							
Benzene	5/28/99	10.0	ND	9.84	ug/l	70.0-130	**98.4**			
Toluene	"	10.0	ND	10.2	"	70.0-130	**102**			
Ethylbenzene	"	10.0	ND	10.6	"	70.0-130	**106**			
Xylenes (total)	"	30.0	ND	31.6	"	70.0-130	**105**			
Surrogate: 4-BFB (PID)	"	*48.0*		*50.4*	"	*50.0-150*	*105*			
Matrix Spike Dup	**0590742-MSD1**		**B905440-07**							
Benzene	5/28/99	10.0	ND	9.39	ug/l	70.0-130	**93.9**	15.0	**4.68**	
Toluene	"	10.0	ND	9.70	"	70.0-130	**97.0**	15.0	**5.03**	
Ethylbenzene	"	10.0	ND	10.0	"	70.0-130	**100**	15.0	**5.83**	
Xylenes (total)	"	30.0	ND	29.4	"	70.0-130	**98.0**	15.0	**6.90**	
Surrogate: 4-BFB (PID)	"	*48.0*		*49.0*	"	*50.0-150*	*102*			

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled:	5/20/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received:	5/22/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	6/1/99 13:15

Notes and Definitions

#	Note
1	The surrogate recovery for this sample cannot be accurately quantified due to interference from coeluting organic compounds present in the sample.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical - Bothell

Joy B Chang, Project Manager

North Creek Analytical, Inc.
Environmental Laboratory Network

B905422

CHAIN OF CUSTODY RECORD

MAXIM TECHNOLOGIES INC

600 South 25th Street
Billings, Montana 59101
Phone (406) 248-9161 • Fax (406) 248-9282

Sunnyside Time Oil
Project or Site Name

9904808
Project Number

ERIC POLZIN
Sampler Name (Printed)

ERIC POLZIN
Contact Name

Maxim Spokane
Report to (Firm or Agency)

10220 N. Nevada, Suite 290
Address

99218

Sampler Signature

DATE COLLECTED	TIME COLLECTED	SAMPLE LOCATION OR DESCRIPTION	COMP OR GRAB	SAMPLE MATRIX	NO. OF CONTAINERS	ANALYSIS REQUIRED: WTPH-D	ANALYSIS REQUIRED: BTEX	NOTES	LAB NUMBER
5/20/99	1600	WTC Production Well		W	2	X	X		B905422-01

Relinquished by:	Date 5/21/99	Time	Received by: Cindy Reed NCA	5/22/99 09:30
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by:	
Relinquished by:	Date	Time	Received by:	

Remarks:

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled:	5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received:	5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	6/1/99 17:58

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
MW-16	B905318-01	Water	5/14/99
MW-2	B905318-02	Water	5/14/99
SW-1	B905318-03	Water	5/15/99
MW-3	B905318-04	Water	5/14/99

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 17:58

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
MW-16			**B905318-01**				**Water**	
Gasoline Range Hydrocarbons	0590585	5/21/99	5/24/99		50000	**140000**	ug/l	
Benzene	"	"	"		500	**30400**	"	
Toluene	"	"	"		500	**31000**	"	
Ethylbenzene	"	"	"		500	**2040**	"	
Xylenes (total)	"	"	"		1000	**17300**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*96.5*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*98.3*	"	
MW-2			**B905318-02**				**Water**	
Gasoline Range Hydrocarbons	0590585	5/21/99	5/21/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	ND	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*94.8*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*97.7*	"	
SW-1			**B905318-03**				**Water**	
Gasoline Range Hydrocarbons	0590585	5/21/99	5/21/99		50.0	**89.8**	ug/l	
Benzene	"	"	"		0.500	**0.553**	"	
Toluene	"	"	"		0.500	**2.10**	"	
Ethylbenzene	"	"	"		0.500	**0.727**	"	
Xylenes (total)	"	"	"		1.00	**11.6**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*97.5*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*98.3*	"	
MW-3			**B905318-04**				**Water**	
Gasoline Range Hydrocarbons	0590585	5/21/99	5/21/99		50.0	**693**	ug/l	
Benzene	"	"	"		0.500	**21.2**	"	
Toluene	"	"	"		0.500	**10.7**	"	
Ethylbenzene	"	"	"		0.500	**10.4**	"	
Xylenes (total)	"	"	"		1.00	**137**	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*98.1*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*50.0-150*		*97.1*	"	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 17:58

Dissolved Metals by EPA 6000/7000 Series Methods
North Creek Analytical - Bothell

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
MW-16			**B905318-01**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**101**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**41.2**	"	
Arsenic	0590761	5/21/99	5/27/99	EPA 6020	0.00100	**0.00825**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00393**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	6/1/99	EPA 6020	0.0100	**2.98**	"	
Zinc	"	"	5/27/99	EPA 6020	0.0100	**0.0625**	"	
MW-2			**B905318-02**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**35.5**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**13.0**	"	
Arsenic	0590761	5/21/99	5/27/99	EPA 6020	0.00100	**0.0272**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00198**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	"	EPA 6020	0.00100	ND	"	
Zinc	"	"	"	EPA 6020	0.0100	ND	"	
SW-1			**B905318-03**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**48.0**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**15.3**	"	
Arsenic	0590761	5/21/99	5/27/99	EPA 6020	0.00100	**0.0118**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00144**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	"	EPA 6020	0.00100	**0.0208**	"	
Zinc	"	"	"	EPA 6020	0.0100	ND	"	
MW-3			**B905318-04**				**Water**	
Calcium	0590546	5/20/99	5/20/99	EPA 6010B	0.250	**68.9**	mg/l	
Iron	"	"	"	EPA 6010B	0.150	ND	"	
Magnesium	"	"	"	EPA 6010B	0.100	**22.9**	"	
Arsenic	0590761	5/21/99	5/27/99	EPA 6020	0.00100	**0.00310**	"	
Chromium	"	"	"	EPA 6020	0.00100	**0.00194**	"	
Lead	"	"	"	EPA 6020	0.00100	ND	"	
Manganese	"	"	6/1/99	EPA 6020	0.00500	**0.724**	"	
Zinc	"	"	5/27/99	EPA 6020	0.0100	ND	"	

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**Refer to end of report for text of notes and definitions.*

Joy B Chang, Project Manager

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Environmental Laboratory Network

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 17:58

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590585	**Date Prepared: 5/20/99**					**Extraction Method: EPA 5030B (MeOH)**				
Blank	**0590585-BLK1**									
Gasoline Range Hydrocarbons	5/20/99			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**1.00**				
Surrogate: 4-BFB (FID)	"	*48.0*		*45.4*	"	*50.0-150*	*94.6*			
Surrogate: 4-BFB (PID)	"	*48.0*		*46.2*	"	*50.0-150*	*96.3*			
Blank	**0590585-BLK2**									
Gasoline Range Hydrocarbons	5/21/99			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**1.00**				
Surrogate: 4-BFB (FID)	"	*48.0*		*41.9*	"	*50.0-150*	*87.3*			
Surrogate: 4-BFB (PID)	"	*48.0*		*46.4*	"	*50.0-150*	*96.7*			
LCS	**0590585-BS1**									
Gasoline Range Hydrocarbons	5/20/99	500		516	ug/l	70.0-130	103			
Surrogate: 4-BFB (FID)	"	*48.0*		*47.5*	"	*50.0-150*	*99.0*			
Duplicate	**0590585-DUP1**		**B905289-03**							
Gasoline Range Hydrocarbons	5/24/99		ND	51.5	ug/l			25.0		
Surrogate: 4-BFB (FID)	"	*48.0*		*46.9*	"	*50.0-150*	*97.7*			
Duplicate	**0590585-DUP2**		**B905318-04**							
Gasoline Range Hydrocarbons	5/25/99		693	703	ug/l			25.0	**1.43**	
Surrogate: 4-BFB (FID)	"	*48.0*		*44.2*	"	*50.0-150*	*92.1*			
Matrix Spike	**0590585-MS1**		**B905242-02**							
Benzene	5/24/99	10.0	ND	9.76	ug/l	70.0-130	**97.6**			
Toluene	"	10.0	ND	10.1	"	70.0-130	**101**			
Ethylbenzene	"	10.0	ND	10.6	"	70.0-130	**106**			
Xylenes (total)	"	30.0	ND	31.4	"	70.0-130	**105**			
Surrogate: 4-BFB (PID)	"	*48.0*		*48.3*	"	*50.0-150*	*101*			

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**Refer to end of report for text of notes and definitions.*

Joy B Chang, Project Manager

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 17:58

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8021B/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Matrix Spike Dup	**0590585-MSD1**		**B905242-02**							
Benzene	5/24/99	10.0	ND	9.55	ug/l	70.0-130	**95.5**	15.0	**2.18**	
Toluene	"	10.0	ND	9.66	"	70.0-130	**96.6**	15.0	**4.45**	
Ethylbenzene	"	10.0	ND	10.3	"	70.0-130	**103**	15.0	**2.87**	
Xylenes (total)	"	30.0	ND	30.3	"	70.0-130	**101**	15.0	**3.88**	
Surrogate: 4-BFB (PID)	"	*48.0*		*47.9*	"	*50.0-150*	*99.8*			

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 17:58

Dissolved Metals by EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590546	**Date Prepared: 5/20/99**					**Extraction Method: EPA 3005A**				
Blank	**0590546-BLK1**									
Calcium	5/20/99			**ND**	mg/l	**0.250**				
Iron	"			**ND**	"	**0.150**				
Magnesium	"			**ND**	"	**0.100**				
Blank	**0590546-BLK2**									
Calcium	5/20/99			**ND**	mg/l	**0.250**				
Iron	"			**ND**	"	**0.150**				
Magnesium	"			**ND**	"	**0.100**				
LCS	**0590546-BS1**									
Calcium	5/20/99	1.00		1.10	mg/l	80.0-120	110			
Iron	"	1.00		1.06	"	80.0-120	106			
Magnesium	"	1.00		1.09	"	80.0-120	109			
Matrix Spike	**0590546-MS1**	**B905296-01**								
Calcium	5/20/99	1.00	44.0	48.1	mg/l	80.0-120	**NR**			1
Iron	"	1.00	ND	1.04	"	80.0-120	**104**			
Magnesium	"	1.00	16.0	17.9	"	80.0-120	**190**			1
Matrix Spike Dup	**0590546-MSD1**	**B905296-01**								
Calcium	5/20/99	1.00	44.0	48.0	mg/l	80.0-120	**NR**	20.0	**2.47**	1
Iron	"	1.00	ND	1.02	"	80.0-120	**102**	20.0	**1.94**	
Magnesium	"	1.00	16.0	18.1	"	80.0-120	**NR**	20.0	**10.0**	1
Batch: 0590761	**Date Prepared: 5/27/99**					**Extraction Method: EPA 3020A**				
Blank	**0590761-BLK1**									
Arsenic	5/27/99			**ND**	mg/l	**0.00100**				
Chromium	"			**ND**	"	**0.00100**				
Lead	6/1/99			**ND**	"	**0.00100**				
Manganese	5/27/99			**ND**	"	**0.00100**				
Zinc	"			**ND**	"	**0.0100**				
LCS	**0590761-BS1**									
Arsenic	5/27/99	0.200		0.218	mg/l	80.0-120	109			
Chromium	"	0.200		0.218	"	80.0-120	109			
Lead	6/1/99	0.200		0.190	"	80.0-120	95.0			
Manganese	5/27/99	0.200		0.225	"	80.0-120	112			

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled: 5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received: 5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported: 6/1/99 17:58

Dissolved Metals by EPA 6000/7000 Series Methods/Quality Control
North Creek Analytical - Bothell

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
LCS (continued)	0590761-BS1									
Zinc	5/27/99	0.200		0.207	mg/l	80.0-120	103			
Matrix Spike	0590761-MS1		B905318-01							
Arsenic	5/27/99	0.200	0.00825	0.275	mg/l	75.0-125	**133**			2
Chromium	"	0.200	0.00393	0.161	"	75.0-125	**78.5**			
Lead	"	0.200	ND	0.198	"	75.0-125	**99.0**			
Manganese	6/1/99	0.200	2.98	3.00	"	75.0-125	**10.0**			1
Zinc	5/27/99	0.200	0.0625	0.231	"	75.0-125	**84.3**			
Matrix Spike	0590761-MS2		B905318-01							
Arsenic	5/27/99	1.00	0.00825	1.08	mg/l	75.0-125	**107**			3
Matrix Spike Dup	0590761-MSD1		B905318-01							
Arsenic	5/27/99	0.200	0.00825	0.278	mg/l	75.0-125	**135**	20.0	**1.49**	2
Chromium	"	0.200	0.00393	0.161	"	75.0-125	**78.5**	20.0	**0**	
Lead	"	0.200	ND	0.202	"	75.0-125	**101**	20.0	**2.00**	
Manganese	6/1/99	0.200	2.98	3.18	"	75.0-125	**100**	20.0	**164**	1
Zinc	5/27/99	0.200	0.0625	0.233	"	75.0-125	**85.2**	20.0	**1.06**	

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Maxim Technologies - Spokane	Project:	Sunnyside-Time Oil	Sampled:	5/14/99 to 5/15/99
N. 10220 Nevada Street, Suite 290	Project Number:	99-04808.100	Received:	5/18/99
Spokane, WA 999218	Project Manager:	Eric Polzin	Reported:	6/1/99 17:58

Notes and Definitions

#	Note
1	Analyses are not controlled on matrix spike RPD and/or percent recoveries when the sample concentration is significantly higher than the spike level.
2	Multiple analyses indicate the percent recovery is outside the control limits due to a matrix effect.
3	Post-digestion Matrix Spike.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical - Bothell

Joy B Chang, Project Manager

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

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CHAIN OF CUSTODY REPORT

Work Order # B905318

REPORT TO:
ATTENTION: Eric Polzin
ADDRESS: 10220 N Nevada, Ste 290
Spokane Wa 99218
PHONE: 509-465-2188 FAX: 509 465 2199
PROJECT NAME: Sunnyside Time Oil
PROJECT NUMBER: 99-04808.100
SAMPLED BY: Eric Polzin

INVOICE TO:
ATTENTION: Scott Sloan
ADDRESS: Time Oil Co
P.O. NUMBER:
NCA QUOTE #:

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: ~~10 (Standard)~~ 7 5 4 3 2 1 Same Day
Fuels & Hydrocarbon Analyses: ~~5 (Standard)~~ 3-4 2 1 Same Day
OTHER Specify:
* Turnaround Requests less than standard may incur Rush Charges.

Analysis Request: WTPH-G; BTEX; Dissolved Metals As, Ca, Cr, Pb, Fe, Mg, Mn, Zn

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	WTPH-G	BTEX	Dissolved Metals								MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	MW-16	5-14-99 2335	B905318-01	X	X	X								W	3	
2.	MW-2	5-14-99 2320	-02	X	X	X								W	3	
3.	SW-1	5-15-99 1015	-03	X	X	X								W	3	
4.	MW-3	5-14-99 2305	-04	X	X	X								W	3	
5.																
6.																
7.																
8.																
9.																
10.																

RELINQUISHED BY (Signature): [signature] DATE: 5-17-99
PRINT NAME: Eric J Polzin FIRM: Maxim TIME: 1400

RECEIVED BY (Signature): S. Wideen DATE: 5/18/[illegible]
PRINT NAME: S. Wideen FIRM: NCA TIME: 900

RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:
W/o 2.1

PAGE 1 OF 1

COC Rev 8, 1/96

APPENDIX G
BIOSLURPING PILOT TEST FIELD DATA

TABLE G-1
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase I
Time Oil Property # 01-068
Sunnyside, WA

5/11/99

	MW-13				MW-14		MW-15	
TIME	DTP	DTW	PT	VAC	DTW	VAC	DTW	VAC
1200	19.86	21.87						
1201	19.87	21.86						
1201.5	19.87	21.86			20.76			
1202	19.86	21.87						
1202.5	19.87	21.87						
1203	19.87	21.87						
1203.5	19.87	21.87			20.77			
1204	19.87	21.88						
1204.5	19.87	21.88						
1205	19.88	21.88						
1206	19.88	21.90						
1207	19.89	21.91			20.76			
1208	19.90	21.92			20.77			
1209	19.90	21.92						
1210	19.91	21.94			20.76			
1215	19.93	21.96						
1220	19.91	21.99						
1222	-	-			20.77			
1225	-	-			20.78			
1215	19.93	22.00						
1230	19.97	22.15						
1235	19.98	22.02			20.77			
1240	19.99	22.35			20.77		20.92	
1245	20.00	22.50			20.77			
1250	20.00	22.50						
1255	20.00	22.50			20.78		20.93	
1300	20.01	22.08						

TABLE G-2
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min.)	MW-13			
		DTP	DTW	PT	IOW
1301	61	20.03	22.11		
1303	63				1.28
1304	64	20.14	22.36		
1306	66	20.20	22.36		
1307	67	20.27	22.44		
1308	68	20.32	22.50		
1309	69	20.39	22.57		1.78
1310	70	20.45	22.65		
1315	75	20.61	22.82		
1321	81	20.90	23.07		
1325	85	21.04	23.18		
1330	90	21.22	23.35		2.1
1335	95	21.39	22.48	1.09	1.60
1345	105	21.60	23.69	2.09	2.10
1400	120	21.89	23.98	2.09	2.25
1415	135	22.09	24.29	2.20	2.75
1430	150	22.25	24.41	2.16	2.70
1445	165	22.36	24.41	2.05	2.85
1505	185	22.47	24.41	1.94	3.00
1545	225	22.63	24.42	1.79	3.30
1615	255	22.67	24.41	1.74	2.90
1645	285	22.68	24.41	1.73	2.90
1715	315	22.72	24.41	1.69	2.90
1745	345	22.74	24.41	1.67	2.80
1815	375	22.75	24.41	1.66	2.90
1845	405	22.76	24.41	1.65	2.60
1915	435	22.77	24.41	1.64	2.70
1945	465	22.77	24.41	1.64	2.90
2015	495	22.78	24.41	1.63	2.90

TABLE G-2 CONTINUED
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min.)	MW-13			
		DTP	DTW	PT	IOW
2045	525	22.79	24.41	1.62	2.60
2115	555	22.75	24.41	1.66	2.20
2200	600	22.80	24.40	1.60	2.50
2300	660	22.80	24.40	1.60	2.80
2400	720	22.81	24.40	1.59	3.00
100	780	22.82	24.40	1.58	2.80
200	840	22.83	24.40	1.57	2.70
300	900	22.84	24.40	1.56	2.70
400	960	22.86	24.40	1.54	2.70
500	1020	22.87	24.40	1.53	3.00
600	1080	22.88	24.41	1.53	2.90
700	1140	22.89	24.40	1.51	1.90
800	1200	22.89	24.40	1.51	3.00
900	1260	22.90	24.41	1.51	2.85
1000	1360	22.91	24.41	1.50	3.20
1100	1420	22.91	24.41	1.50	3.20
1200	1480	22.92	24.41	1.49	3.30
1300	1540	22.93	24.41	1.48	3.30
1400	1600	22.94	24.41	1.47	3.20
1500	1660	22.95	24.42	1.47	3.30
1553	1713	22.95	24.41	1.46	3.25

TABLE G-3
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (hrs.)	ET (min.)	MW-8 DTW	MW-8 IOW
5/11/99 12:00				
5/11/99 13:23	1:23	83	20.61	0.00
5/11/99 13:45	1:45	105	20.63	0.00
5/11/99 13:58	1:58	118	20.66	0.00
5/11/99 14:22	2:22	142	20.68	0.00
5/11/99 15:06	3:06	185	20.68	0.00
5/11/99 16:12	4:12	252	20.71	0.00
5/11/99 17:08	5:08	308	20.71	0.00
5/11/99 18:08	6:08	386	20.72	0.00
5/11/99 19:12	7:12	432	20.72	0.00
5/11/99 20:11	8:11	491	20.74	0.00
5/11/99 21:01	9:01	541	20.74	0.00
5/11/99 22:09	10:09	609	20.72	0.00
5/11/99 23:14	11:14	674	20.72	0.00
5/12/99 0:15	12:15	735	20.72	0.00
5/12/99 1:15	13:15	795	20.73	0.00
5/12/99 2:13	14:13	853	20.74	0.00
5/12/99 3:16	15:16	916	20.76	0.00
5/12/99 4:15	16:15	975	20.77	0.00
5/12/99 5:15	17:15	1035	20.77	0.00
5/12/99 6:11	18:11	1091	20.78	0.00
5/12/99 7:15	19:15	1155	20.77	0.00
5/12/99 8:13	20:13	1213	20.78	0.00
5/12/99 9:06	21:06	1266	20.81	0.00
5/12/99 11:06	23:06	1386	20.80	0.00
5/12/99 13:14	1:14	1514	20.81	0.00
5/12/99 15:10	3:10	1690	20.84	0.00
5/12/99 15:58	3:58	1735	20.82	0.00

TABLE G-4
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (hrs.)	ET (min.)	MW-10 DTW	MW-10 IOW
5/11/99 12:00				
5/11/99 13:20	1:20	80	20.16	0.00
5/11/99 13:42	1:42	82	20.17	0.00
5/11/99 13:55	1:55	97	20.16	0.00
5/11/99 14:19	2:19	139	20.15	0.00
5/11/99 15:05	3:05	185	20.16	0.00
5/11/99 16:10	4:10	250	20.17	0.00
5/11/99 17:05	5:05	305	20.17	0.00
5/11/99 18:07	6:07	367	20.17	0.00
5/11/99 19:10	7:10	430	20.17	0.00
5/11/99 20:09	8:09	489	20.17	0.00
5/11/99 21:05	9:05	545	20.17	0.00
5/11/99 22:07	10:07	607	20.17	0.00
5/11/99 23:10	11:10	669	20.18	0.00
5/13/99 0:15	12:15	735	20.12	0.00
5/12/99 1:11	13:11	791	20.20	0.00
5/12/99 2:10	14:10	850	20.17	0.00
5/12/99 3:15	15:15	915	20.18	0.00
5/12/99 4:12	16:12	972	20.16	0.00
5/12/99 5:12	17:12	1032	20.20	0.00
5/12/99 6:10	18:10	1090	20.18	0.00
5/12/99 7:12	19:12	1152	20.19	0.00
5/12/99 8:10	20:10	1210	20.17	0.00
5/12/99 9:05	21:05	1265	20.17	0.00
5/12/99 11:02	23:02	1382	20.15	0.00
5/12/99 13:11	1:11	1511	20.14	0.00
5/12/99 15:06	3:06	1686	20.15	0.00
5/12/99 15:55	3:55	1735	20.14	0.00

TABLE G-5
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (hrs.)	ET (min.)	MW-6 DTP	MW-6 DTW	MW-6 IOW
5/11/99 12:00					
5/11/99 13:14	1:14	74		19.28	0.01
5/11/99 13:39	1:39	99		19.26	0.01
5/11/99 13:51	1:51	111		19.27	0.01
5/11/99 14:15	2:15	135		19.28	0.01
5/11/99 15:00	3:00	180		19.26	0.005
5/11/99 16:00	4:00	240		19.27	0.01
5/11/99 17:00	5:00	300	19.12	19.28	0.01
5/11/99 18:00	6:00	360	19.14	19.3	0.02
5/11/99 19:00	7:00	720	19.14	19.31	0.01
5/11/99 20:00	8:00	480	19.14	19.31	0.01
5/11/99 21:00	9:00	540	19.13	19.31	0.01
5/11/99 22:00	10:00	600	19.12	19.3	0.01
5/11/99 23:05	11:05	665	19.13	19.29	0.01
5/12/99 0:06	12:06	726	19.13	19.3	0.02
5/12/99 1:05	13:05	785	19.13	19.31	0.02
5/12/99 2:06	14:06	846	19.13	19.29	0.01
5/12/99 3:09	15:09	909	19.13	19.3	0.01
5/12/99 4:07	16:07	967	19.13	19.3	0.01
5/12/99 5:06	17:06	1026	19.13	19.31	0.02
5/12/99 6:05	18:05	1085	19.12	19.3	0.02
5/12/99 7:07	19:07	1147	19.14	19.31	0.02
5/12/99 8:05	20:05	1205	19.13	19.3	0.01
5/12/99 9:15	21:15	1275	19.15	19.33	0.02
5/12/99 11:09	23:09	1389	19.15	19.34	0.03
5/12/99 13:06	1:06	1149	19.14	19.34	0.03
5/12/99 15:12	3:12	1572	19.15	19.34	0.03
5/12/99 15:58	3:58	1618	19.15	19.35	0.03

TABLE G-6
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (hrs)	ET (min)	MW-7 DTW	MW-7 IOW
5/11/99 12:00				
5/11/99 13:17	1:17	77	19.92	0.00
5/11/99 13:40	1:40	100	19.95	0.00
5/11/99 13:52	1:52	112	19.93	0.00
5/11/99 14:17	2:17	137	19.95	0.00
5/11/99 15:02	3:02	182	19.94	0.00
5/11/99 16:05	4:05	245	19.96	0.00
5/11/99 17:02	5:02	305	19.96	0.00
5/11/99 18:05	6:05	365	19.96	0.00
5/11/99 19:07	7:07	427	19.97	0.00
5/11/99 20:02	8:02	482	19.97	0.00
5/11/99 21:02	9:02	542	19.97	0.00
5/11/99 22:02	10:02	602	19.94	0.00
5/12/99 0:08	12:08	728	19.94	0.00
5/12/99 0:09	12:09	729	19.94	0.00
5/12/99 1:09	13:09	789	19.93	0.00
5/12/99 2:09	14:09	849	19.94	0.00
5/12/99 3:12	15:12	912	19.95	0.00
5/12/99 4:10	16:10	970	19.95	0.00
5/12/99 5:09	17:09	1029	19.95	0.00
5/12/99 6:08	18:08	1088	19.94	0.00
5/12/99 7:10	19:10	1150	19.94	0.00
5/12/99 8:07	20:07	1207	19.94	0.00
5/12/99 9:05	21:05	1265	19.98	0.00
5/12/99 11:04	23:04	1384	19.95	0.00
5/12/99 13:07	1:07	1507	19.95	0.00
5/12/99 15:07	3:07	1627	19.96	0.00
5/12/99 15:57	3:57	1677	19.96	0.00

TABLE G-7
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (hrs.)	ET (min)	MW-11 DTW	MW-11 IOW
5/11/99 12:00				
5/11/99 13:25	1:25	85	20.38	0.00
5/11/99 13:47	1:47	107	20.38	0.00
5/11/99 13:59	1:59	119	20.38	0.00
5/11/99 14:24	2:24	144	20.38	0.00
5/11/99 15:09	3:09	189	20.40	0.00
5/11/99 16:14	4:14	254	20.41	0.00
5/11/99 17:11	5:11	311	20.41	0.00
5/11/99 18:09	6:09	369	20.42	0.00
5/11/99 19:13	7:13	433	20.41	0.00
5/11/99 20:14	8:14	494	20.41	0.00
5/11/99 21:13	9:13	553	20.41	0.00
5/11/99 22:13	10:13	613	20.38	0.00
5/11/99 23:17	11:17	677	20.38	0.00
5/13/99 0:17	12:17	737	20.38	0.00
5/12/99 1:18	13:18	798	20.38	0.00
5/12/99 2:16	14:16	856	20.40	0.00
5/12/99 3:19	15:19	919	20.38	0.00
5/12/99 4:17	16:17	977	20.39	0.00
5/12/99 5:17	17:17	1037	20.40	0.00
5/12/99 6:15	18:15	1095	20.41	0.00
5/12/99 7:17	19:17	1157	20.41	0.00
5/12/99 8:15	20:15	1215	20.38	0.00
5/12/99 9:10	21:10	1270	20.40	0.00
5/12/99 11:07	23:07	1387	20.39	0.00
5/12/99 13:16	1:16	1516	20.39	0.00
5/12/99 15:10	3:10	1690	20.39	0.00
5/12/99 16:00	4:00	1740	20.39	0.00

TABLE G-8
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min)	MW-15 DTW	MW-15 IOW	MW-5 DTW	MW-5 PT	MW-5 IOW
1301	61					
1328	88	20.94				
1333	93	20.95	0.09			
1400	120	20.93				
1415	135	20.99	0.20			
1430	150	20.99	0.16			
1445	165	21.00	0.14			
1505	185	21.00	0.14			
1545	225	21.02	0.08			
1615	255	21.02	0.10			
1645	285	21.02	0.09			
1715	315	21.02	0.10			
1745	345	21.02	0.10			
1815	375	21.02	0.09			
1845	405	21.03	0.10			
1915	435	21.03	0.09			
1945	465	21.03	0.10			
2015	495	21.05	0.10			
2045	525	21.05	0.11			
2115	555	21.05	0.11			
2200	600	21.05	0.09			
2222	612			18.12	17.96	0
2300	660	21.04	0.10			
2320	680			18.12	17.96	0
2400	720	21.04	0.10			
2419	739			18.12	19.97	0
100	780	21.06	0.11			
121	821			18.13	17.97	0

TABLE G-8 CONTINUED
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min)	MW-15 DTW	MW-15 IOW	MW-5 DTW	MW-5 PT	MW-5 IOW
200	840	21.07	0.10			
219	859			18.12	17.97	0
300	900	21.07	0.10			
323	923			18.12	17.96	0
400	960	21.08	0.08			
420	980			18.13	17.97	0
500	1020	21.08	0.10			
521	1041			18.13	17.97	0
600	1080	21.09	0.10			
700	1140	21.08	0.10			
720	1160			18.13	17.97	0
800	1200	21.10	0.10			
900	1260	21.09	0.10			
1000	1360	21.12	0.10			
1100	1420	21.11	0.08			
1200	1480	21.12	0.10			
1300	1540	21.11	0.14			
1400	1600	21.11	0.12			
1500	1660	21.11	0.12			
1553	1713	21.13	0.12			

TABLE G-9
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min.)	MW-14		MW-15	
		DTW	IOW	DTW	IOW
1301	61				
1302	62	20.77			
1303	63		0.07	20.91	
1305	65	20.77			
1307	67	20.78			
1308	68		0.20		
1309	69	20.79			
1310	70	20.81			0.08
1315	75	20.80			0.17
1325	85	20.79	0.28		
1328	88			20.94	0.02
1330	90	20.89			
1333	93	20.86	0.35		
1345	105	20.90	0.35		
1400	120	20.99	0.38	20.93	
1415	135	21.09	0.41	20.99	0.20
1430	150	21.09	0.38	20.99	0.16
1445	165	21.12	0.36	21.00	0.14
1505	185	21.14	0.38	21.00	0.14
1545	225	21.12	0.43	21.02	0.08
1615	255	21.04	0.40	21.02	0.10
1645	285	21.15	0.40	21.02	0.09
1715	315	21.14	0.39	21.02	0.10
1745	345	21.18	0.39	21.02	0.10
1815	375	21.08	0.40	21.02	0.09
1845	405	21.12	0.39	21.03	0.10
1915	435	21.10	0.41	21.03	0.09
1945	465	21.19	0.40	21.03	0.10
2015	495	21.21	0.40	21.05	0.10
2045	525	21.25	0.40	21.05	0.11
2115	555	21.24	0.40	21.05	0.11
2200	600	21.25	0.35	21.05	0.09
2300	660	21.23	0.40	21.04	0.10
2400	720	21.29	0.35	21.04	0.10
100	780	21.28	0.35	21.06	0.11
200	840	21.21	0.36	21.07	0.10
300	900	21.34	0.35	21.07	0.10

TABLE G-9 CONTINUED
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min.)	MW-14		MW-15	
		DTW	IOW	DTW	IOW
400	960	21.29	0.35	21.08	0.08
500	1020	21.32	0.30	21.08	0.10
600	1080	21.32	0.35	21.09	0.10
700	1140	21.33	0.35	21.08	0.10
800	1200	21.32	0.35	21.10	0.10
900	1260	21.36	0.32	21.09	0.10
1000	1360	21.39	0.32	21.12	0.10
1100	1420	21.40	0.31	21.11	0.08
1200	1480	21.40	0.32	21.12	0.10
1300	1540	21.40	0.39	21.11	0.14
1400	1600	21.40	0.34	21.11	0.12
1500	1660	21.42	0.38	21.11	0.12
1553	1713	21.43	0.38	21.13	0.12

TABLE G-10
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min.)	MW-7		MW-10	
		DTW	IOW	DTW	IOW
1301	61				
1317	77	19.92			
1320	80			20.16	
1430	150			20.17	
1505	185	19.93			
1545	225			20.16	
1815	375			20.15	
1915	435				
2200	600	19.94			
2300	660			20.16	
400	960	19.96			
500	1020			20.17	
600	1080			20.17	
1100	1420	19.96			
1200	1480			20.17	

TABLE G-11
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min.)	MW-6		
		DTW	PT	IOW
1301	61			
1314	74	19.28		0.01
1345	105	19.26		0.01
1445	165	19.27		0.01
1745	345	19.28		0.01
1915	435			
2115	555	19.26		0.005
300	900	19.27		0.01
1000	1360	19.28	19.12	0.01

TABLE G-12
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase II
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET (min)	MW-8		MW-11	
		DTW	IOW	DTW	IOW
1301	61				
1323	83	20.61			
1325	85			20.38	
1400	120	20.63			
1415	135			20.38	
1615	255	20.66			
1645	285			20.38	
1845	405	20.68			
1301	1915	435			20.68
1302	1945	465			
1303	2015	495			
1310	720	20.68			
1315	780			20.4	
1345	1080	20.71			
1400	1140			20.41	
1645	1540	20.71			
1715	1600			20.41	

TABLE G-13
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-13 DTP	DTW	PT	IOW
5/12/99 16:30					
5/12/99 16:31	0:01	22.96	24.41	1.45	
5/12/99 16:32	0:02	22.96	24.42	1.46	
5/12/99 16:43	0:13	22.95	24.41	1.46	
5/12/99 16:44	0:14	22.96	24.41	1.45	
5/12/99 16:45	0:15	22.96	24.41	1.45	
5/12/99 16:50	0:20	22.97	24.41	1.44	
5/12/99 16:51	0:21	22.99	24.41	1.42	
5/12/99 16:52	0:22	22.99	24.41	1.42	
5/12/99 16:53	0:23	22.99	24.41	1.42	
5/12/99 16:57	0:27	23.00	24.41	1.41	
5/12/99 17:00	0:30	23.01	24.41	1.40	3.90
5/12/99 17:05	0:35	23.02	24.41	1.39	4.10
5/12/99 17:15	0:45	23.04	24.41	1.37	4.00
5/12/99 17:30	1:00	23.05	24.41	1.36	4.20
5/12/99 17:45	1:15	23.09	24.41	1.32	
5/12/99 18:15	1:45	23.12	24.41	1.29	4.20
5/12/99 18:45	2:15	23.16	24.41	1.25	4.30
5/12/99 19:45	3:15	23.21	24.41	1.20	43.00
5/21/99 20:45	4:15	23.28	24.41	1.13	4.30
5/12/99 21:45	5:15	23.35	24.41	1.06	4.30
5/12/99 22:45	6:15	23.43	24.41	0.98	4.20
5/12/99 23:45	7:15	23.50	24.41	0.91	4.10
5/13/99 0:51	8:21	23.57	24.41	0.84	3.90
5/13/99 1:45	9:15	23.64	24.41	0.77	4.00
5/13/99 2:45	10:15	23.75	24.41	0.66	4.30
5/13/99 3:45	11:15	23.84	24.41	0.57	4.30
5/13/99 4:45	12:15	23.93	24.41	0.48	4.30
5/13/99 5:45	13:15	24.00	24.41	0.41	4.30
5/13/99 6:45	14:15	24.04	24.41	0.37	4.30
5/13/99 7:45	15:15	24.09	24.41	0.32	4.50
5/13/99 8:45	16:15	24.12	24.41	0.29	4.50
5/13/99 9:45	17:15	24.15	24.41	0.26	4.50
5/13/99 10:45	18:15	24.18	24.41	0.23	4.50

TABLE G-13 CONTINUED
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-13 DTP	DTW	PT	IOW
5/13/99 11:45	19:15	24.21	24.41	0.20	4.50
5/13/99 12:45	20:15	24.22	24.41	0.19	4.50
5/13/99 13:45	21:15	24.24	24.41	0.17	4.70
5/13/99 14:45	22:15	24.25	24.41	0.16	
5/13/99 15:45	23:15	27.27	24.41	-2.86	4.60

TABLE G-14
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-15 DTW	IOW
5/12/99 16:30			
5/12/99 16:44	0:14	21.11	
5/12/99 16:52	0:22	21.11	
5/12/99 16:57	0:27	21.12	
5/12/99 17:05	0:35	21.12	0.13
5/12/99 17:15	0:45	21.13	0.14
5/12/99 17:30	1:00	21.15	0.12
5/12/99 17:45	1:15	21.15	
5/12/99 18:15	1:45	21.15	0.14
5/12/99 18:45	2:15	21.16	
5/12/99 19:45	3:15	21.18	0.01
5/12/99 20:45	4:15	21.20	0.15
5/12/99 21:45	5:15	21.20	0.13
5/12/99 22:45	6:15	21.20	0.13
5/12/99 23:45	7:15	21.20	0.13
5/13/99 0:45	8:15	21.23	0.14
5/13/99 1:45	9:15	21.21	0.13
5/13/99 2:45	10:15	21.25	0.14
5/13/99 3:45	11:15	21.23	0.12
5/13/99 4:45	12:15	21.24	0.13
5/13/99 5:45	13:15	21.25	14.00
5/13/99 6:45	14:15	21.26	0.14
5/13/99 7:45	15:15	21.26	0.14
5/13/99 8:45	16:15	21.26	0.13
5/13/99 9:45	17:15	21.26	0.13
5/13/99 10:45	18:15	21.26	0.16
5/13/99 11:45	19:15	21.26	0.16
5/13/99 12:45	20:15	21.27	0.16
5/13/99 13:45	21:15	21.28	0.17
5/13/99 14:55	22:25	21.29	0.17
5/13/99 15:45	23:15	21.29	0.16

TABLE G-15
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-5 DTW	PT	IOW
5/12/99 16:31	0:01			
5/12/19 22:03	5:33	18.16	17.97	0
5/13/99 0:00	7:30	18.15	17.96	0
5/13/99 2:00	9:30	18.14	17.96	0
5/13/99 4:35	12:05	18.16	17.97	0
5/13/99 8:00	15:30	18.17	17.97	0
5/13/99 16:06	23:57	18.17	17.97	0

TABLE G-16
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-8 DTW	IOW
5/12/99 16:30	0:00		
5/12/99 16:48	0:18	20.82	
5/12/99 17:17	0:47	20.83	
5/12/99 17:47	1:17	20.83	
5/12/99 17:52	1:22	20.87	
5/12/99 19:57	3:27	20.85	
5/12/99 20:51	4:21	20.87	
5/12/99 21:51	5:21	20.88	0.00
5/12/99 22:53	6:23	20.90	
5/12/99 23:51	7:21	20.91	
5/13/99 0:51	8:21	20.91	0.00
5/13/99 1:53	9:23	20.91	
5/13/99 2:51	10:21	20.93	
5/13/99 3:54	11:24	20.91	0.00
5/13/99 4:52	12:22	20.94	
5/13/99 5:54	13:24	20.94	
5/13/99 6:53	14:23	20.94	0.00
5/13/99 7:54	15:24	20.21	
5/13/99 8:00	15:30	20.97	
5/13/99 9:45	17:15	20.96	
5/13/99 1:45	9:15	20.98	
5/13/99 10:58	18:28	20.97	
5/13/99 12:45	20:15	20.97	
5/13/99 13:45	21:15	20.97	
5/13/99 13:59	21:29	20.97	
5/13/99 15:45	23:15	20.97	

TABLE G-17
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-14 DTW	VAC
5/12/99 16:30	#REF!		
5/12/99 16:52	0:22	21.39	
5/21/99 16:57	0:27	21.43	
5/12/99 17:00	0:30	21.43	0.43
5/12/99 17:05	0:35	21.45	0.44
5/12/99 17:15	0:45		0.42
5/12/99 17:30	1:00	21.49	0.47
5/12/99 17:45	1:15	21.51	
5/12/99 18:15	1:45	21.55	0.44
5/12/99 18:45	2:15	21.59	
5/12/99 19:45	3:15	21.62	0.44
5/12/99 20:45	4:15	21.62	0.42
5/12/99 21:45	5:15	21.65	0.42
5/12/99 22:45	6:15	21.68	0.40
5/12/99 23:45	7:15	21.68	0.39
5/13/99 0:51	8:21	21.70	0.43
5/13/99 1:45	9:15	21.72	0.38
5/13/99 2:45	10:15	21.73	0.44
5/13/99 3:45	11:15	21.73	0.39
5/13/99 4:45	12:15	21.76	0.31
5/13/99 5:45	13:15	21.76	0.38
5/13/99 6:45	14:15	21.76	0.42
5/13/99 7:45	15:15	21.77	0.46
5/13/99 8:45	16:15	21.78	0.45
5/13/99 9:45	17:15	21.78	0.46
5/13/99 1:45	9:15	21.78	0.47
5/13/99 11:45	19:15	21.78	0.48
5/13/99 12:45	20:15	21.78	0.50
5/13/99 13:45	21:15	21.79	0.50
5/13/99 14:45	22:15	21.80	0.50
5/13/99 15:45	23:15	21.82	0.49

TABLE G-18
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-6 DTW	PT	IOW	MW-7 DTW
5/12/99 16:30	0:00				
5/12/99 16:45	0:15				19.95
5/12/99 16:55	0:25	19.34	19.16		
5/12/99 17:15	0:45				19.96
5/12/99 17:17	0:47	19.34	19.15		
5/12/99 17:45	1:15	19.35	19.15		
5/12/99 17:47	1:17				19.96
5/12/99 18:49	2:19				19.96
5/12/99 18:57	2:27	19.35	19.16		
5/12/99 19:52	3:22	19.32	19.15	0.04	
5/12/99 19:55	3:25				19.94
5/12/99 20:54	4:24	19.31	19.15		
5/12/99 20:50	4:20				19.92
5/12/99 21:49	5:19	19.33	19.15	0.02	
5/12/99 21:54	5:24				19.96
5/12/99 22:53	6:23	19.31	19.15		
5/12/99 23:51	7:21	19.33	19.15		
5/13/99 0:51	8:21	19.34	19.15	0.02	
5/13/99 1:45	9:15	19.35	19.15		
5/13/99 2:50	10:20	19.34	19.15		
5/13/99 3:51	11:21	19.35	19.14	0.02	
5/13/99 4:51	12:21	19.35	19.15		
5/13/99 5:52	13:22	19.35	19.14		
5/13/99 6:51	14:21	19.35	19.15	0.02	
5/13/99 7:59	15:29	19.37	19.17		
5/13/99 8:55	16:25	19.37	19.17		
5/13/99 9:45	17:15				19.98
5/13/99 9:56	17:26	19.37	19.17		
5/13/99 10:45	18:15				19.97
5/13/99 10:58	18:28	19.37	19.17		
5/13/99 11:57	19:27	19.37	19.17		
5/13/99 12:45	20:15				19.97
5/13/99 12:59	20:29	19.38	19.16		
5/13/99 13:50	21:20				19.95
5/13/99 13:59	21:29	19.38	19.16		
5/13/99 14:58	22:28	19.39	19.17		
5/13/99 15:53	23:23				19.96
5/13/99 15:58	23:28	19.4	19.18		

TABLE G-19
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-10 DTW	IOW
5/12/99 16:30			
5/12/99 16:45	0:15	20.15	
5/12/99 17:15	0:45	20.16	
5/12/99 17:49	1:19	20.16	
5/12/99 18:51	2:21	20.16	
5/12/99 19:57	3:27	20.18	
5/12/99 20:53	4:23	20.17	
5/12/99 21:54	5:24	20.2	0.00
5/12/99 22:56	6:26	20.18	
5/12/99 23:54	7:24	20.19	
5/13/99 0:55	8:25	20.21	0.00
5/13/99 1:55	9:25	20.2	
5/13/99 2:53	10:23	20.24	
5/13/99 3:56	11:26	20.18	0.00
5/13/99 4:54	12:24	20.23	
5/13/99 5:55	13:25	20.19	
5/13/99 6:55	14:25	20.24	0.00
5/13/99 7:54	15:24	20.21	
5/13/99 8:52	16:22	20.18	
5/13/99 9:51	17:21	20.2	
5/13/99 10:53	18:23	20.17	
5/13/99 11:55	19:25	20.18	
5/13/99 12:51	20:21	20.17	
5/13/99 13:53	21:23	20.18	
5/13/99 14:55	22:25	20.16	
5/13/99 15:55	23:25	20.16	

TABLE G-20
Summary of Groundwater Monitoring Data
Bioslurping Test-Phase III
Time Oil Property # 01-068
Sunnyside, WA

TIME	ET hr	MW-11 DTW	IOW
5/12/99 16:30	0:00		
5/12/99 16:51	0:21	20.38	
5/12/99 17:18	0:48	20.40	
5/12/99 17:50	1:20	20.40	
5/12/99 18:51	2:21	20.40	
5/12/99 20:02	3:32	20.40	
5/12/99 20:56	4:26	20.40	
5/12/99 20:53	4:23	20.41	
5/12/99 21:53	5:23	20.39	0.00
5/12/99 22:56	6:26	20.40	
5/12/99 23:54	7:24	20.41	
5/13/99 0:55	8:25	20.42	0.00
5/13/99 1:55	9:25	20.42	
5/13/99 2:53	10:23	20.42	
5/13/99 4:01	11:31	20.41	
5/13/99 4:54	12:24	20.42	
5/13/99 5:55	13:25	20.42	
5/13/99 6:55	14:25	20.42	0.00
5/13/99 7:52	15:22	20.43	
5/13/99 8:50	16:20	20.41	
5/13/99 9:49	17:19	20.42	
5/13/99 10:58	18:28	20.42	
5/13/99 11:59	19:29	20.42	
5/13/99 12:49	20:19	20.42	
5/13/99 13:53	21:23	20.42	
5/13/99 14:58	22:28	20.42	
5/13/99 15:55	23:25	20.42	

TABLE G-21
Summary of Recharge Data
Time Oil Property # 01-068
Sunnyside, WA

Time	Minutes Since Test End	MW-13		MW-9		MW-14	MW-15
		DTW	DTP	DTW	DTP	DTW	DTW
1627	-	-	-	-	-	21.86	-
1630	0	24.41	24.28	-	-	-	-
1630.5	0.5	24.41	24.28	-	-	21.86	-
1631	1	24.41	24.28	-	-	21.85	-
1631.5	1.5	24.41	24.28	-	-	21.85	-
1632	2	24.41	24.2	-	-	21.85	-
1632.5	2.5	-	-	27.97	-	-	-
1633	3	24.41	24.28	-	-	21.86	21.30
1634	4	24.41	24.27	-	-	21.80	-
1634.5	4.5	-	-	27.72	-	-	-
1635	5	24.41	24.27	-	-	21.86	-
1636	6	24.41	24.27	-	-	-	21.31
1636.5	6.5	-	-	27.52	-	21.85	-
1637	7	24.41	24.27	-	-	21.85	-
1637.5	7.5	-	-	27.42	-	-	-
1638	8	24.41	24.26	-	-	21.85	21.21
1638.5	8.5	-	-	27.3	-	-	-
1639	9	24.41	24.26	-	-	21.84	-
1639.5	9.5	-	-	27.21	-	-	-
1640	10	24.42	24.26	-	-	21.83	-
1640.5	10.5	-	-	27.1	-	-	-
1641	11	24.42	24.26	-	-	21.82	-
1641.5	11.5	-	-	27	-	-	-
1642	12	24.42	24.25	-	-	21.81	21.31
1642.5	12.5	-	-	26.92	-	-	-
1643	13	24.43	24.26	-	-	21.80	-
164.5	13.5	-	-	26.82	-	-	-
1644	14	24.43	24.25	-	-	21.80	-
1644.5	14.5	-	-	26.72	-	-	-
1645	15	24.43	24.25	-	-	21.78	21.31
1645.5	15.5	-	-	26.64	-	-	-
1646	16	-	-	26.61	-	21.78	-
1646.5	16.5	-	-	26.58	-	-	-
1647	17	-	-	26.52	-	21.77	-
1647.5	17.5	-	-	26.49	-	-	-
1648	18	-	-	26.45	-	21.77	21.30
1648.5	18.5	-	-	26.41	-	-	-
1649	19	-	-	26.38	-	21.76	-
1649.5	19.5	-	-	26.33	-	-	-
1650	20	24.43	24.23	-	-	21.75	-
1650.5	20.5	-	-	26.25	-	-	-
1651	21	-	-	-	-	21.75	21.30
1651.5	21.5	-	-	26.19	-	-	-

Time	Minutes Since Test End	MW-13		MW-9		MW-14	MW-15
		DTW	DTP	DTW	DTP	DTW	DTW
1652	22	-	-	-	-	21.74	-
1652.5	22.5	-	-	26.12	-	-	-
1653	23	-	-	-	-	21.74	21.30
1653.5	23.5	-	-	26.05	-	-	-
1654	24	-	-	-	-	21.73	-
1654.5	24.5	-	-	25.99	-	-	-
1655	25	24.43	24.2	-	-	21.72	-
1655.5	25.5	-	-	25.92	-	-	-
1656	26	-	-	-	-	21.72	-
1656.5	26.5	-	-	25.86	-	-	21.29
1657	27	-	-	-	-	21.71	-
1657.5	27.5	-	-	25.79	-	-	-
1658	28	-	-	-	-	21.70	-
1658.5	28.5	-	-	25.74	-	-	-
1659	29	-	-	-	-	21.70	-
1659.5	29.5	-	-	25.68	-	-	-
1700	30	24.43	24.17	-	-	-	-
1700.5	30.5	-	-	25.62	-	-	-
1701	31	-	-	-	-	21.69	21.28
1701.5	31.5	-	-	25.56	-	-	-
1702	32	-	-	-	-	21.69	-
1702.5	32.5	-	-	25.5	-	-	-
1703	33	-	-	-	-	21.68	-
1703.5	33.5	-	-	25.45	-	-	-
1704	34	-	-	-	-	21.68	-
1704.5	34.5	-	-	25.41	-	-	-
1705	35	24.43	24.13	-	-	21.67	21.28
1705.5	35.5	-	-	25.36	-	-	-
1706.5	36.5	-	-	25.32	-	-	-
1708.5	38.5	-	-	25.24	-	-	-
1709.5	39.5	-	-	25.2	-	-	-
1710	40	24.43	24.1	-	-	21.65	21.27
1710.5	40.5	-	-	25.16	-	-	-
1411.5	41.5	-	-	25.12	-	-	-
1712.5	42.5	-	-	25.08	-	-	-
1713.5	43.5	-	-	25.05	-	-	-
1714.5	44.5	-	-	25.02	-	-	-
1715	45	24.43	24.09	-	-	21.64	21.27
1716.5	46.5	-	-	24.95	-	-	-
1718.5	48.5	-	-	24.89	-	-	-
1720	50	24.43	24.05	-	-	21.62	-

Time	Minutes Since Test End	MW-13		MW-9		MW-14	MW-15
		DTW	DTP	DTW	DTP	DTW	DTW
1720.5	50.5	-	-	24.82	-	-	-
1722.5	52.5	-	-	24.76	-	-	-
1724.5	54.5	-	-	24.71	-	-	-
1725	55	24.43	24.04	-	-	21.60	21.26
1726.5	56.4	-	-	24.65	-	-	-
1728.5	57.5	-	-	24.6	-	-	-
1730	60	24.43	24.02	-	-	21.59	21.26
1730.5	60.5	-	-	24.59	-	-	-
1732.5	62.5	-	-	24.51	-	-	-
1734.5	64.5	-	-	24.46	-	-	-
1735	65	24.43	23.96	-	-	21.57	21.25
1736.5	66.5	-	-	24.42	-	-	-
1738.5	68.5	-	-	24.38	-	-	-
1740	70	24.43	23.92	-	-	21.56	21.25
1740.5	70.5	-	-	24.35	-	-	-
1742.5	72.5	-	-	24.31	-	-	-
1744.5	74.5	-	-	24.28	-	-	-
1745	75	24.43	23.85	-	-	21.55	21.25
1746.5	76.5	-	-	24.25	-	-	-
1748.5	78.8	-	-	24.22	-	-	-
1750	80	24.43	23.77	-	-	21.54	21.25
1750.5	80.5	-	-	24.19	-	-	-
1752.5	82.5	-	-	24.17	-	-	-
1754.5	84.5	-	-	24.15	-	-	-
1755	85	24.43	23.73	-	-	21.53	21.25
1756.5	86.5	-	-	24.13	-	-	-
1758.5	88.5	-	-	24.11	-	-	-
1800	90	24.43	23.68	-	-	21.52	21.24
1802.5	92.5	-	-	24.07	-	-	-
1805	95	24.43	23.65	-	-	-	-
1802.5	97.5	-	-	24.02	-	-	-
1805	100	24.43	23.6	-	-	-	-
1807.5	112.5	-	-	23.98	-	-	-
1810	120	24.43	23.52	-	-	-	-
1812.5	122.5	-	-	23.91	-	-	-
1815	125	-	-	-	-	21.49	21.23
1820	130	24.28	23.47	-	-	-	-
1830	140	-	-	-	-	21.47	21.22
1832.5	142.5	-	-	23.84	-	-	-
1840	150	24.2	23.38	-	-	-	-

Time	Minutes Since Test End	MW-13 DTW	MW-13 DTP	MW-9 DTW	MW-9 DTP	MW-14 DTW	MW-15 DTW
1842.5	152.5	-	-	23.78	-	-	-
1845	155	-	-	-	-	21.45	21.22
1850	160	24.1	23.32	-	-	-	-
1852.5	162.5	-	-	23.73	-	-	-
1900	170	23.94	23.26	-	-	21.44	21.21
1902.5	172.5	-	-	23.68	-	-	-
1909	179	-	-	-	-	21.38	-
1910	180	23.84	23.19	-	-	-	-
1912.5	182.5	-	-	23.64	-	-	-
1920	190	23.74	23.14	-	-	-	-
1922.5	200.5	-	-	23.6	-	-	-
1930	208	23.65	23.08	-	-	-	-
1932.5	210.5	-	-	23.55	-	-	-
1940	218	23.55	23.03	-	-	-	-
1942.5	222.5	-	-	23.51	-	-	-
1950	230	23.47	22.98	-	-	-	-
2000	240	23.55	22.93	-	-	-	-
2001	210	-	-	23.45	-	-	-
2009	218	-	-	-	-	-	21.20
2010	219	23.47	22.89	-	-	21.36	-
2020	229	23.41	22.84	-	-	-	-
2021	230	-	-	23.38	-	-	-
2030	240	23.22	22.8	-	-	-	-
2040	250	23.13	22.76	-	-	-	-
2041	251	-	-	23.32	-	-	-
2100	270	23.09	22.68	-	-	-	-
2101	271	-	-	23.27	-	-	-
2109	279	-	-	-	-	-	21.19
2120	290	23.01	22.6	-	-	-	-
2121	291	-	-	23.22	-	-	-
2140	310	22.9	2.53	-	-	-	-
2141	311	-	-	23.18	-	-	-
2200	330	22.83	22.83	-	-	-	-
2201	331	-	-	23.13	-	-	-
2207	338	-	-	-	-	-	21.18
2208	339	-	-	21.33	-	-	-
2220	351	22.77	22.77	-	-	-	-
2221	352	-	-	23.1	-	-	-
2240	371	22.7	22.7	-	-	-	-
2241	372	-	-	23.07	-	-	-
2300	391	22.63	22.63	-	-	-	-

Time	Minutes Since Test End	MW-13		MW-9		MW-14	MW-15
		DTW	DTP	DTW	DTP	DTW	DTW
2301	392	-	-	23.03	-	-	-
2308	399	-	-	-	-	-	21.17
2309	400	-	-	-	-	21.30	-
2330	421	22.54	22.21	-	-	-	-
2400	451	22.47	22.14	-	-	-	-
2401	452	-	-	22.94	-	-	-
2408	459	-	-	-	-	-	21.17
2409	460	-	-	-	-	21.29	-
2430	481	22.41	22.08	-	-	-	-
100	511	22.35	22.02	-	-	-	-
101	512	-	-	22.86	-	-	-
111	521	21.16					-
112	522	-	-	-	-	21.26	-
130	538	22.29	21.98	-	-	-	-
200	668	22.25	21.94	-	-	-	-
201	669	-	-	22.78	-	-	-
210	678	-	-	-	-	-	21.16
211	679	-	-	-	-	21.24	-
300	698	22.17	21.97	-	-	-	-
301	699	-	-	22.72	-	-	-
311	709	-	-	-	-	-	21.15
312	710	-	-	-	-	21.24	-
400	758	22.09	21.8	-	-	-	-
401	759	-	-	22.67	-	-	-
410	768	-	-	-	-	-	21.15
411	769	-	-	-	-	21.23	-
500	818	22.03	21.74	-	-	-	-
501	819	-	-	22.62	-	-	-
509	827	-	-	-	-	-	21.14
510	828	-	-	-	-	21.21	-
600	878	21.96	21.68	-	-	-	-
601	879	-	-	22.57	-	-	-
609	887	-	-	-		-	21.14
610	888	-	-	-	-	21.20	-
700	938	21.91	21.65	-	-	-	-
701	939	-	-	22.52	-	21.19	-
702	940	-	-	-	-	-	21.14
800	998	21.87	21.6	-	-	-	-
801	999	-	-	22.48	-	-	-

APPENDIX H

PILOT TEST TREATED GROUNDWATER DISCHARGE PERMIT

❖ PORT OF SUNNYSIDE ❖
P.O. BOX 329 ❖ SUNNYSIDE, WA 98944 ❖ PH: 509-839-7678 FAX: 509-839-7462

PORT OF SUNNYSIDE

Industrial Wastewater Treatment Facility
User Contract

PORT: PORT OF SUNNYSIDE,
a Washington Municipal Corporation

CONTRACTED USER: MAXIM TECHNOLOGIES, INC.

DATE: May 10, 1999

RECITALS:

A. The Port owns and operates an Industrial Wastewater Treatment Facility ("hereinafter referred to as the IWWTF") for the collection, treatment and disposal of industrial wastewater.

B. The operation of the IWWTF is subject to the laws of the United States and of the State of Washington including, without limitation, laws relating to discharges of Industrial Wastewater as administered by the Department of Ecology, which issues permits to both the Port and to Contracted User.

C. Contracted User desires to discharge industrial wastewater into the IWWTF on a temporary basis. The Port is willing to provide assistance to Contracted User by accepting such industrial wastewater so long as capacity is available, in the opinion of the Port, without prejudice to the Port's ability to collect, treat, store and dispose of Industrial Wastewater for other Users of the IWWTF, whether such Other Users are presently connected to the IWWTF or may be connected after the date of this Contract.

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. DEFINITIONS:
The definitions in the Revised Code of Washington and the regulations adopted by the Department of Ecology relating to wastewater discharges are hereby adopted, together with the following definitions:

1.1 "*CONTRACTED USER*" shall mean the person, corporation, partnership or other entity signing this Contract.

1.2 "*INDUSTRIAL WASTEWATER*" shall mean water or liquid-carried waste from industrial or commercial processes as distinct from domestic wastes (which include human wastes and related kitchen, bath and laundry wastes).

1.3 "*IWWTF*" shall mean the Port of Sunnyside Industrial Wastewater Treatment Facilities.

1.4 "*OTHER USER(S)*" shall mean any other industrial or commercial customer(s) of the IWWTF, other than the Contracted User.

1.5 "*PERMIT*" shall mean any permit issued by the State of Washington, Department of Ecology, or any other regulatory agency having jurisdiction over the IWWTF, approving the discharge of industrial wastewaters to and from the IWWTF.

2. **ONE TIME DISCHARGE, NOTICE OF DISCHARGE**:

2.1 **One Time Discharge**: This Contract shall be for a one time discharge into the IWWTF anticipated to occur on or about May 17, 1999.

2.2 **Notice of Discharge**: Prior to discharge, Contracted User shall notify the Port of the exact date of the discharge. Notice will be given not less than 48 hours prior to the discharge date to enable Port personnel to observe the discharge.

3. **ACCEPTANCE OF INDUSTRIAL WASTEWATER**:

3.1 **Acceptance, Treatment**: The Port agrees to accept industrial wastewater from Contracted User subject to the limitations set forth herein, and to treat and dispose of such wastewater in accordance with applicable federal and state laws and regulations relating thereto.

3.2 **Discharge Limitations**: Contracted User shall discharge in conformance with Contracted User's letter dated April 21, 1999, attached hereto as Exhibit "A" and incorporated herein by reference.

3.3 **Determination of Volume, Sampling**: The parties acknowledge that Contract User intends to transport wastewater to the Port's facilities by truck. The determination of the volume of wastewater discharged to the IWWTF shall be in a manner specified by the Port. Contracted User shall be responsible for sampling wastewater discharged to the IWWTF in a manner specified by the Port and shall provide results of any such analysis to the Port.

4. **CONTRACT SET UP FEE, DISCHARGE RATE**:

4.1 **Contract Set Up Fee:** Contracted User shall pay to the Port a contract set up fee in the amount of $1,000.00, payable upon the signing of this Contract. Such fee shall cover all of the Port administrative costs.

4.2 **Wastewater Rates**: Upon completion of the discharge, Contracted User shall pay a rate of $2.82 per 100 cubic feet of hydraulic volume and $.059 per pound of chemical oxygen demand (COD). Such rate may be revised upon 24 hours notice to Contracted User. A minimum hydraulic volume charge of $100.00 will be billed to the Contracted User.

4.3 **Other Costs**: The wastewater rates set forth above shall cover the usual costs of receiving, treating and disposing of Contracted User's industrial wastewater, provided, however, Contracted User shall be responsible for any other costs or expenses in connection with Contracted User's industrial wastewater including, without limitation, permit fees, testing of Contracted User's wastewater, and any other tests required by the Department of Ecology in connection with Contracted User's wastewater.

4.4 **Payments by Contracted User**: The Port shall mail a billing to Contracted User for the one time discharge upon completion of the discharge, and such payment shall be due not later than 15 days from the date of such billing. Payments received after the date due shall be subject to a late charge of $25.00.

5. **PERMITS, LIMITATIONS, PROHIBITED DISCHARGES**:

5.1 **Discharge Permits**: Contracted User shall be solely responsible for obtaining any permits authorizing User to discharge into the IWWTF. Contracted User shall provide a copy of its Discharge Permit, together with any revisions, to the Port.

5.2 **Environmentally Significant Impact of Wastewater**: Contracted User represents and warrants to the Port that Contracted User's wastewater contains no components not set forth on Exhibit "A" to this Contract.

5.3 **Prohibited Discharge**: Other than the constituents set forth on Exhibit "A" to this Contract, Contracted User shall not cause or permit the release or disposal of any toxic or hazardous substances into the IWWTF, except for such discharges specifically allowed by the Permit issued to Contracted User by the State of Washington Department of Ecology and which are specifically within the maximum limits set forth on Schedule A. Toxic or hazardous substances shall be interpreted broadly to include, but not to be limited to, any material or substance that is defined or classified under federal, state or local laws as: (a) a "hazardous substance" pursuant to Section 311 of the Federal Water Pollution Control Act, 33 U.S.C. Section 1321, as now or hereafter amended; (b) a "hazardous waste" pursuant to Section 1004 or Section 3001 of the Resource Conservation and Recovery Act, 42 U.S.C. Section 6903, 42 U.S.C. Section 6921, as now or hereafter amended; (c) a toxic pollutant under Section 307(1)(a) of the Federal Water Pollution Control Act, 33 U.S.C. Section 1317(a)(a) as now or hereafter amended; (d) a "hazardous air pollutant" under Section 112 of the Clean Air Act, 42 U.S.C. Section 7412, as now or hereafter amended; (e) a "hazardous material"; under the Hazardous Material

Transportation Act, 49 U.S.C. Section 1802(2), as now or hereafter amended; (f) or a "hazardous substance" as defined under Washington State's Model Toxic Control Act (MTCA), RCW 70.105D.020(5), as now or hereafter amended; (g) toxic or hazardous pursuant to resolutions promulgated now or hereafter under the aforementioned laws; (h) presenting a risk to human health or the environment under other applicable federal, state or local laws, ordinances, or regulations, as now or as may be passed to promulgated in the future. "Toxic or Hazardous Substances" shall also mean any substance that after release into the environment and upon exposure, ingestion, inhalation or assimilation, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavior abnormalities, cancer or genetic abnormalities. "Toxic or Hazardous Substances" specifically includes, but is not limited to, asbestos, polychlorinated biphenyls (PCBs), petroleum and petroleum based derivatives, flammable explosives, radioactive material and urea formaldehyde.

6. LIMITATION OF LIABILITY OF PORT:

The Port shall not be liable to Contracted User for any damages or losses suffered by Contracted User as a result of or in connection with:

6.1 The acts or omissions of any other User of the IWWTF; or

6.2 Actions taken by any federal or state agency with regard to the operation of the IWWTF; or

6.3 Any event or occurrence not reasonably foreseeable by the Port; or

6.4 Any operation of the IWWTF in accordance with reasonable and customary practices in the industry.

7. INDEMNIFICATION:

The Contracted User shall indemnify and hold harmless the Port, its Commissioners, employees, agents and representatives from and against any and all claims, actions, suits and other legal proceedings and from and against any and all claims, damages, engineering fees, losses, liabilities, costs or expenses whatsoever (including, without limitation, interest, penalties, and reasonable attorneys' fees and expenses) which the Port, its Commissioners, employees, agents and representatives may incur (or which may be claimed against the Port by any other person or entity whatsoever) arising out of or in connection with (i) Contracted User's discharge of any wastewater or substance into the IWWTF prohibited by this Contract or by law or regulation or in connection with the enforcement by the Port of its rights hereunder (except to the extent directly and actually resulting from the gross negligence or willful misconduct of the Port), or (ii) any loss or

liability incurred by the Port as a result of or in connection with the use, release or existence of toxic or hazardous substances or the like from the Contracted User's system into IWWTF. The Port shall not, in any way, be liable for any failure by the Port to operate the IWWTF as a result of any Governmental Acts or any other cause beyond the control of the Port. Notwithstanding the foregoing, the Contracted User shall not be required to indemnify the Port for any claims, damages, losses, liabilities, costs or expenses to the direct and actual extent, caused by the gross negligence or wilful misconduct of the Port in operation of the IWWTF. Nothing in this paragraph 8 is intended to limit or shall limit any obligation of the Contracted User to the Port, including but not limited to the payment of the Termination Fee.

Upon demand by Port, the Contracted User shall reimburse the Port for any reasonable legal or other expenses (including attorney's fees) incurred in connection with investigating or defending against any of the foregoing. If any action, suit or proceeding arising from any of the foregoing is brought against the Port, the Contracted User, to the extent determined by Port as necessary or advisable in order to protect the Port's rights hereunder, will resist and defend such action, suit or proceeding or cause the same to be resisted and defend by counsel designated by Contracted User (which counsel shall be satisfactory to the Port). The Port shall have the right to employ separate counsel if the Port determines in good faith that such counsel is necessary to protect its interests and to participate in the investigation and defense and, in such event, the fees and expenses of such counsel shall be paid by the Port unless the employment of such counsel has been authorized by the Contracted User. The Contracted User shall not be liable for any settlement of any such action without its consent but if any such action is settled with the consent of the Contracted User or if there be final judgment against the Contracted User and/or the Port, the Contracted User shall indemnify and hold harmless the Port from and against any losses by reason of such settlement or judgment.

8. REMEDIES IF CONTRACTED USER FAILS TO PERFORM:

If Contracted User fails to make any payment or perform any obligation required of Contracted User under the terms of this Contract, the Port shall be entitled to exercise all rights and remedies allowed by law or equity including, without limitation, the following remedies which may be cumulative:

8.1 **Collection Action**: The Port may commence an action for the collection of past due payments or obligations.

8.2 **Termination of Service**: The Port may refuse to accept wastewater from Contracted User as follows:

8.2.1 In the event Contracted User fails to pay any wastewater charges or any other payments due from Contracted User, by the date such charges are due, then the Port may refuse to accept wastewater from Contracted User

upon the Port giving Contracted User five (5) days written notice of intent to terminate service.

8.2.2 In the event of any other act or omission by Contracted User which the Port determines to be an emergency circumstance the Port may terminate service immediately following notice given by the Port to Contracted User of its intent to discontinue service. Such notice may be given verbally in person or by telephone, facsimile machine, mail, personal delivery or such other form appropriate under the circumstances. For the purpose of this Contract, "emergency circumstance" shall include, without limitation, prohibited discharges by Contracted User or discharges beyond the limits set forth in Schedule "A". Service shall be resumed upon the curing/resolution of the circumstance causing the termination of service.

8.3 **Damages, Fines, Penalties**: In the event Contracted User fails to perform this Contract, including, without limitation, prohibited discharges, Contracted User shall be responsible for any damages to the Port and Other Users, which damages may include, without limitation:

8.3.1 Costs incurred in connection with removal of debris or obstructions from pipelines, pumping stations, lagoons and sprayfields;

8.3.2 Costs of repairs to the Port facilities and equipment;

8.3.3 Any environmental cleanup costs;

8.3.4 Any damages, costs or expenses for which the Port may be obligated as a result of Contracted User's failure to perform this Contract including any consequential damages of Other Users of the IWWTF.

9. **SEVERABILITY**:

In the event any term or provision of this Contract shall be determined to be invalid, illegal, or unenforceable, such determination shall not, in any way, affect the remaining provisions of this Contract.

10. **CONTRACT NOT ASSIGNABLE**:

This Contract is for the Contracted User, and its existing industrial use, and is not assignable to any Other User or any other person or entity, in whole or in part, without the prior written consent of the Port.

11. **NOTICE**:

In the event of emergency circumstances, either party may give notice as circumstances reasonably require which may include verbal notice by telephone or in person, written notice by facsimile machine, or written notice given as hereinafter provided. Other than emergency circumstances, any notice required to be given hereunder or any notice to be given by law shall be in writing and may be given by personal delivery, by facsimile machine followed by

certified mail, or by certified mail, addressed to the parties at their addresses set forth herein or such other address as they shall provide to the other party in writing, or may be given to either of them in any other manner prescribed or authorized by law. All notices given hereunder shall be conclusively deemed received upon the third day, excluding Sundays, following the date of posting in the United States Mail, if such notice is given by mail. Notice to the Contracted User shall be addressed as follows:

MAXIM Technologies, Inc.
Attn: ~~Brian Polzin~~ Gene St. Godard
N. 10220 Nevada Street, Suite 290
Spokane, Washington 99218
Telephone: (509) 465-2188
Facsimile: (509) 465-2199

Notice to the Port shall be addressed as follows:

IWWTF, Supervisor
Port of Sunnyside
520 So. Seventh Street
P. O. Box 329
Sunnyside, Washington 98944
Telephone: (509) 839-7678
Facsimile: (509) 839-7462

12. INTERPRETATION AND FAIR CONSTRUCTION OF CONTRACT:

This Contract has been reviewed and approved by each of the parties. In the event it should be determined that any provision of this Contract is uncertain or ambiguous, the language in all parts of this Contract shall be in all cases construed as a whole according to its fair meaning and not strictly construed for nor against either party.

13. WAIVER OF BREACH:

The failure of any party hereto to insist upon strict performance of any of the covenants and agreements herein contained, or to exercise any option or right herein conferred, in any one or more instances, shall not be construed to be a waiver or relinquishment of any such option or right, or of any other covenants or agreement, but the same shall be and remain in full force and effect.

14. LAW:

This Contract shall be governed by, construed and enforced in accordance with the laws of the State of Washington, irrespective of the fact that any one of the parties is now or may

become a resident of a different state. Venue for any action under this Contract shall lie in Superior Court of the State of Washington, Yakima County, Washington.

15. **ATTORNEYS FEES**:

If an arbitration proceeding, suit or action is filed to enforce or interpret any provision or to collect any payment due hereunder, the prevailing party shall be entitled to recover reasonable attorney fees to be fixed by the arbitrator or court, if any appeal is taken, such further sum as may be fixed by the Appellate Court, together with costs and disbursements as allowed by law.

PORT OF SUNNYSIDE

By: _____
Jeffrey E. Matson, President

CONTRACTED USER

MAXIM Technologies, Inc.

By: _____

* Maxim would request a written + signed letter of approval by Port of Sunnyside prior to discharge, after port has reviewed analytical testing data.

MAXIM TECHNOLOGIES INC

MAXIM Technologies, Inc.
N. 10220 Nevada Street, Suite 290
Spokane, Washington 99218
(509) 465-2188
Fax: (509) 465-2199

Project No. 9904808.100
Doc. No. RIFSgwcon.wpd

April 21, 1999

Mr. Bob Farrell
Port of Sunnyside
P.O. Box 329
Sunnyside, Washington 98944

Re: Groundwater Discharge Concentrations
RI/FS Pilot Test
Time Oil Co. Property No. 01-068
107 West Lincoln Avenue
Sunnyside, Washington

Mr. Farrell:

The intentions of MAXIM Technologies (Maxim) is to perform a series of pilot tests on the Valley View Mart and Washington Hills Cellars properties during the week of May 10th. Three separate pilot tests will be conducted, consisting of: vapor extraction, air sparging with vapor extraction and Bioslurping. The third pilot test (bioslurping) will be the only phase to generate water and is currently scheduled to start on the 11th of May and will run through the 14th of May, 1999. The test may be extended for an additional one to two days depending upon field results. A 21,000 gallon tank will be placed on site and used for groundwater storage throughout the duration of the test. At the current time we do not expect to discharge from the tank until completion of the pilot program although a larger volume may be generated. The tank is equipped for air stripping, which will occur throughout the bioslurping portion of the test. Prior to discharge, a sample will be taken from the point of discharge and analyzed for the following parameters:

- Aromatic volatile hydrocarbons: Benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA Method 8020A;
- Gasoline Range Organics (GRO) by Washington State Department of Ecology (Ecology) Method WTPH-G;
- Total Lead by EPA Method 239.2.

No water will be discharged until the initial sample laboratory results have been received. We expect that no more than 42,000 gallons of water will be discharged to the port of Sunnyside storm drain located on the Washington Hills Cellars property. Petroleum hydrocarbon concentrations in the discharge water will meet the Washington State Department of Ecology Model Toxics Control Act (MTCA) Method A cleanup levels for groundwater as listed in the following table:

Compound	TPH-G	Benzene	Toluene	Ethylbenzene	Xylenes	Total Lead
MTCA Method A levels for groundwater	1,000	5.0	40.0	30.0	20.0	5.0

Note: All concentrations are listed in ug/L (parts per billion)

We expect discharge to occur on the 17th of May, 1999, after completion of pilot testing activities at the site.

We appreciate the opportunity to work with the Port of Sunnyside and look forward to a favorable decision by your Board of Commissioners on our proposal to dispose of treated water. Your cooperation is appreciated in order to help Time Oil Company complete this project in a timely manner. Should you have any questions regarding this groundwater discharge letter or other aspects of this project, please do not hesitate to call us at your earliest convenience.

Respectfully submitted,
MAXIM Technologies, Inc.

Eric John Polzin
Geologist

Eugene N.J. St.Godard, P.G., C.H.G.
Senior Hydrogeologist
Spokane Office Manager

cc: Kim Sherwood,
Washington State Department of Ecology
Central Region Office

Scott Sloan,
Time Oil Company

MAXIM
TECHNOLOGIES INC

Maxim Technologies, Inc.
N. 10220 Nevada Street, Suite 290
Spokane, Washington 99218
Phone: (509) 465-2188
Fax: (509) 465-2199

Port of Sunnyside
520 So. Seventh Street
P.O. Box 329
Sunnyside, Washington 98944

Re: Groundwater Discharge
Time Oil Co. Property No. 01-068/
Washington Hills Cellars Property
Sunnyside, Washington

The undersigned representatives from Maxim Technologies, Inc. and the Port of Sunnyside have reviewed analytical testing results of treated groundwater generated from the completion of a "bioslurp" pilot test at the above referenced property. Analytical testing has revealed that hydrocarbon concentrations within the effluent meet criteria set forth in the Port of Sunnyside contract agreement dated May 10, 1999, and the undersigned Port of Sunnyside representative approves the discharge of the effluent to the Industrial Wastewater Treatment Facility. Treated effluent will be gauged in accordance with the contract and reported to the Port of Sunnyside upon completion of discharge.

Name: Robert Farrell
Title: Port Engineer
Port of Sunnyside
Date: 5-20-99

Name: Eric D. Pierson
Title: Project Geologist
Maxim Technologies, Inc.
Date: 5-20-99

www.ncalabs.com

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425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
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503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

Maxim Technologies - Spokane	Project:	Sunnyside Time Oil	Sampled: 5/14/99
10220 N. Nevada St., Suite 290	Project Number:	9904808-100	Received: 5/17/99
Spokane, WA 99218	Project Manager:	Eric Polzin	Reported: 5/18/99 11:50

ANALYTICAL REPORT FOR SAMPLES:

Sample Description	Laboratory Sample Number	Sample Matrix	Date Sampled
DISCH-1	S905047-01	Water	5/14/99

Dennis D Wells, Laboratory Director

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10220 N. Nevada St., Suite 290	Project Number:	9904808-100	Received: 5/17/99
Spokane, WA 99218	Project Manager:	Eric Polzin	Reported: 5/18/99 11:50

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A
North Creek Analytical - Spokane

Analyte	Batch Number	Date Prepared	Date Analyzed	Surrogate Limits	Reporting Limit	Result	Units	Notes*
DISCH-1			**S905047-01**				**Water**	
Gasoline Range Hydrocarbons	0590034	5/17/99	5/17/99		50.0	ND	ug/l	
Benzene	"	"	"		0.500	ND	"	
Toluene	"	"	"		0.500	ND	"	
Ethylbenzene	"	"	"		0.500	ND	"	
Xylenes (total)	"	"	"		1.00	7.15	"	
Surrogate: 4-BFB (FID)	"	"	"	*50.0-150*		*67.6*	*%*	
Surrogate: 4-BFB (PID)	"	"	"	*53.0-142*		*67.6*	"	

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Maxim Technologies - Spokane	Project:	Sunnyside Time Oil	Sampled: 5/14/99
10220 N. Nevada St., Suite 290	Project Number:	9904808-100	Received: 5/17/99
Spokane, WA 99218	Project Manager:	Eric Polzin	Reported: 5/18/99 11:50

Dissolved Metals by EPA 6010/7000 Series Methods
North Creek Analytical - Spokane

Analyte	Batch Number	Date Prepared	Date Analyzed	Specific Method	Reporting Limit	Result	Units	Notes*
DISCH-1			S905047-01				Water	
Lead	0590033	5/17/99	5/17/99	EPA 6010A	0.030	ND	mg/l	

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Maxim Technologies - Spokane	Project:	Sunnyside Time Oil	Sampled: 5/14/99
10220 N. Nevada St., Suite 290	Project Number:	9904808-100	Received: 5/17/99
Spokane, WA 99218	Project Manager:	Eric Polzin	Reported: 5/18/99 11:50

Gasoline Hydrocarbons (Toluene to Dodecane) and BTEX by WTPH-G and EPA 8020A/Quality Control
North Creek Analytical - Spokane

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590034	**Date Prepared: 5/17/99**					**Extraction Method: GC Volatiles**				
Blank	**0590034-BLK1**									
Gasoline Range Hydrocarbons	5/17/99			**ND**	ug/l	**50.0**				
Benzene	"			**ND**	"	**0.500**				
Toluene	"			**ND**	"	**0.500**				
Ethylbenzene	"			**ND**	"	**0.500**				
Xylenes (total)	"			**ND**	"	**1.00**				
Surrogate: 4-BFB (FID)	"	*25.0*		*18.8*	"	*50.0-150*	*75.2*			
Surrogate: 4-BFB (PID)	"	*25.0*		*16.6*	"	*53.0-142*	*66.4*			
LCS	**0590034-BS1**									
Gasoline Range Hydrocarbons	5/17/99	1000		807	ug/l	70.0-150	80.7			
Surrogate: 4-BFB (FID)	"	*25.0*		*28.1*	"	*50.0-150*	*112*			
LCS	**0590034-BS2**									
Benzene	5/17/99	10.0		8.77	ug/l	80.0-120	87.7			
Toluene	"	10.0		8.10	"	80.0-120	81.0			
Ethylbenzene	"	10.0		7.74	"	80.0-120	77.4			
Xylenes (total)	"	30.0		23.5	"	80.0-120	78.3			
Surrogate: 4-BFB (PID)	"	*25.0*		*16.0*	"	*53.0-142*	*64.0*			
Duplicate	**0590034-DUP1**		**S905047-01**							
Gasoline Range Hydrocarbons	5/17/99		ND	ND	ug/l			60.0		
Surrogate: 4-BFB (FID)	"	*25.0*		*24.2*	"	*50.0-150*	*96.8*			
Surrogate: 4-BFB (PID)	"	*25.0*		*23.1*	"	*53.0-142*	*92.4*			
Matrix Spike	**0590034-MS1**		**S905047-01**							
Gasoline Range Hydrocarbons	5/17/99	1000	ND	636	ug/l	70.0-130	**63.6**			
Surrogate: 4-BFB (FID)	"	*25.0*		*24.0*	"	*50.0-150*	*96.0*			
Matrix Spike	**0590034-MS2**		**S905047-01**							
Benzene	5/17/99	10.0	ND	9.39	ug/l	54.0-143	**93.9**			
Toluene	"	10.0	ND	9.07	"	48.0-145	**90.7**			
Ethylbenzene	"	10.0	ND	9.10	"	49.0-142	**91.0**			
Xylenes (total)	"	30.0	7.15	25.6	"	55.0-140	**61.5**			
Surrogate: 4-BFB (PID)	"	*25.0*		*20.0*	"	*53.0-142*	*80.0*			

North Creek Analytical, Inc.

**Refer to end of report for text of notes and definitions.*

Dennis D Wells, Laboratory Director

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Spokane, WA 99218	Project Manager:	Eric Polzin	Reported: 5/18/99 11:50

Dissolved Metals by EPA 6010/7000 Series Methods/Quality Control
North Creek Analytical - Spokane

Analyte	Date Analyzed	Spike Level	Sample Result	QC Result	Units	Reporting Limit / Recov. Limits	Recov. %	RPD Limit	RPD %	Notes*
Batch: 0590033	**Date Prepared: 5/17/99**					**Extraction Method: EPA 3010 Water**				
Blank	0590033-BLK1									
Lead	5/17/99			**ND**	mg/l	**0.030**				
LCS	0590033-BS1									
Lead	5/17/99	1.00		1.01	mg/l	70.0-130	101			
Duplicate	0590033-DUP1		S905038-17							
Lead	5/17/99		ND	ND	mg/l			20.0		
Matrix Spike	0590033-MS1		S905038-17							
Lead	5/17/99	1.00	ND	0.975	mg/l	80.0-120	**97.5**			
Matrix Spike Dup	0590033-MSD1		S905038-17							
Lead	5/17/99	1.00	ND	0.933	mg/l	80.0-120	**93.3**	20.0	**4.40**	

www.ncalabs.com

Seattle 18939 120th Avenue NE, Suite 101, Bothell, WA 98011-9508
425.420.9200 fax 425.420.9210
Spokane East 11115 Montgomery, Suite B, Spokane, WA 99206-4776
509.924.9200 fax 509.924.9290
Portland 9405 SW Nimbus Avenue, Beaverton, OR 97008-7132
503.906.9200 fax 503.906.9210
Bend 20354 Empire Avenue, Suite E-9, Bend, OR 97708-1883
541.383.9310 fax 541.382.7588

Maxim Technologies - Spokane	Project:	Sunnyside Time Oil	Sampled: 5/14/99
10220 N. Nevada St., Suite 290	Project Number:	9904808-100	Received: 5/17/99
Spokane, WA 99218	Project Manager:	Eric Polzin	Reported: 5/18/99 11:50

Notes and Definitions

#	Note
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
Recov.	Recovery
RPD	Relative Percent Difference

North Creek Analytical, Inc.

Dennis D Wells, Laboratory Director

NORTH CREEK ANALYTICAL
Environmental Laboratory Services

18939 120th Avenue N.E., Suite 101, Bothell, WA 98011-9508 (425) 420-9200 FAX 420-9210
East 11115 Montgomery, Suite B, Spokane, WA 99206-4779 (509) 924-9200 FAX 924-9290
9405 S.W. Nimbus Avenue, Beaverton, OR 97008-7132 (503) 906-9200 FAX 906-9210

CHAIN OF CUSTODY REPORT

Work Order # 3905047

REPORT TO:
ATTENTION: ERIC POLZIN
ADDRESS: 10220 N. Nevada Suite 290
Spokane Wa 99208
PHONE: 509-468-2188 FAX: 509-465-2199
PROJECT NAME: Sunny Side Time Oil
PROJECT NUMBER: 9904808-100
SAMPLED BY: ERIC POLZIN

INVOICE TO:
ATTENTION: Scott Sloan
ADDRESS: Time Oil Co
P.O. NUMBER:
NCA QUOTE #

TURNAROUND REQUEST in Business Days *
Organic & Inorganic Analyses: 10 Standard | 7 | 5 | 4 | 3 | 2 | 1 | Same Day
Fuels & Hydrocarbon Analyses: 5 Standard | 3-4 | 2 | X | Same Day
OTHER Specify
* Turnaround Requests less than standard may incur Rush Charges

	CLIENT SAMPLE IDENTIFICATION	SAMPLING DATE/TIME	NCA SAMPLE ID (Laboratory Use Only)	Analysis Request: NWTPH-G	BTEX	Total Lead	MATRIX (W, S, A, O)	# OF CONTAINERS	COMMENTS
1.	DISCH-1	5-14-99 1417		X	X	X	W	4	
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									

RELINQUISHED BY (Signature): Eric Polzin DATE: 5-17-99
PRINT NAME: ERIC J POLZIN FIRM: Maxim TIME:
RECEIVED BY (Signature): DATE: 5/17/99
PRINT NAME: DENNIS D WELLS FIRM: NCA TIME: 1145

RELINQUISHED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:
RECEIVED BY (Signature): DATE:
PRINT NAME: FIRM: TIME:

ADDITIONAL REMARKS:

PAGE OF