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River Terrace Voluntary Corrective Measures Bioventing System Annual Report (3 of 3)

2017

Disposal of Samples

Samples are held at HEAL for a minimum of thirty days and then transferred to the HEAL warehouse for disposal. Analytical results are used to characterize their respective sample contamination level(s) so that the proper disposal can be performed. These wastes will be disposed of according to their hazard as well as their type and level of contamination. Refer to the Hall Environmental Analysis Laboratory Chemical Hygiene Plan and current Sample Disposal SOP for details regarding waste disposal.

Waste drums are provided by an outside agency. These drums are removed by the outside agency and disposed of in a proper manner.

The wastes that are determined to be non-hazardous are disposed of as non-hazardous waste in accordance with the Chemical Hygiene Plan and Sample Disposal SOP.

6.0 Analytical Procedures

All analytical methods used at HEAL incorporate necessary and sufficient Quality Assurance and Quality Control practices. A Standard Operating Procedure (SOP) is used to provide the necessary criteria to yield acceptable results. These procedures are reviewed at least annually and revised as necessary and are attached as a pdf file in the Laboratory Information Management System (LIMS) for easy access by each analyst. The sample is often consumed or altered during the analytical process. Therefore, it is important that each step in the analytical process be correctly followed in order to yield valid data.

When unforeseen problems arise, the analyst, technical director, and, when necessary, laboratory manager meet to discuss the factors involved. The analytical requirements are evaluated and a suitable corrective action or resolution is established. The client is notified in the case narrative with the final report or before, if the validity of their result is in question.

List of Procedures Used

Typically, the procedures used by HEAL are EPA approved methodologies or 20th edition Standard Methods. However, proprietary methods for client specific samples are sometimes used. On occasion, multiple methods or multiple method revisions are used, in this event the SOP is written to include the requirements of all referenced methods. The following tables list EPA and Standard Methods Method numbers with their corresponding analytes and/or instrument classification.

Methods Utilized at HEAL

Drinking Water(DW) Non-Potable Water (NPW) Solids (S)

Methodology	Matrix	Title of Method
180.1	DW NPW	"Turbidity (Nephelometric)"
200.2	DW NPW	"Sample Preparation Procedure For Spectrochemical Determination of Total Recoverable Elements"
200.7	DW NPW	"Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry"
200.8	DW NPW	"Determination of Trace Elements in Waters and Wastes by Inductively Coupled Plasma-Mass Spectrometry."
245.1	DW NPW	"Mercury (Manual Cold Vapor Technique)"

300.0	DW NPW S	"Determination of Inorganic Anions by Ion Chromatography"
413.2	NPW S	"Oil and Grease"
418.1	NPW S	"Petroleum Hydrocarbons (Spectrophotometric, Infrared)"
504.1	DW	"EDB, DBCP and 123TCP in Water by Microextraction and Gas Chromatography"
524.2	DW	"Measurement of Purgeable Organic Compounds in Water by Capillary Column Gas Chromatography/Mass Spectrometry"
552.3	DW	"Determination of Haloacetic Acids and Dalapon in Drinking Water by Ion-Exchange Liquid-Solid Extraction and Gas Chromatography with an Electron Capture Detector"
624	NPW	Appendix A to Part 136 Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater Method 624-Purgeables"
1311	S	"Toxicity Characteristic Leaching Procedure"
1311ZHE	S	"Toxicity Characteristic Leaching Procedure"
1664A	NPW	"N-Hexane Extractable Material (HEM; Oil and Grease) and Silica Gel Treated N-Hexane Extractable Material) by Extraction and Gravimetry"
3005A	NPW	"Acid Digestion of Waters for Total Recoverable or Dissolved Metals for Analysis by FLAA or ICP Spectroscopy"
3010A	NPW	"Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy"
3050B	S	"Acid Digestion of Sediment, Sludge, and Soils"
3510C	DW NPW	"Separatory Funnel Liquid-Liquid Extraction"
3540	S	"Soxhlet Extraction"
3545	S	"Pressurized Fluid Extraction(PFE)"
3665	NPW S	"Sulfuric Acid/Permanganate Cleanup"
5030B	NPW	"Purge-and-Trap for Aqueous Samples"
5035	S	"Closed-System Purge-and-Trap and Extraction for Volatile Organics in Soil and Waste Samples"
6010B	NPW S	"Inductively Coupled Plasma-Atomic Emission Spectrometry"

7470A	NPW	"Mercury in Liquid Waste (Manual Cold-Vapor Technique)"
7471A	S	"Mercury in Solid or Semisolid Waste (Manual Cold Vapor Technique)"
8021B	NPW S	"Aromatic and Halogenated Volatiles By Gas Chromatography Using Photoionization and/or Electrolytic Conductivity Detectors"
8015D	NPW	"Nonhalogenated Volatile Organics by Gas Chromatography"
	S	(Gasoline Range and Diesel Range Organics)
8081A	NPW S	"Organochlorine Pesticides by Gas Chromatography"
8082	NPW S	"Polychlorinated Biphenyls (PCBs) by Gas Chromatography"
8260B	NPW S	"Volatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)"
8270C	NPW S	"Semivolatile Organic Compounds by Gas Chromatography/ Mass Spectrometry (GC/MS)"
8310	NPW S	"Polynuclear Aromatic Hydrocarbons"
9060	NPW	"Total Organic Carbon"
9067	NPW S	"Phenolics (Spectrophotometric, MBTH With Distillation)"
9095A	S	"Paint Filter Liquids Test"
H-8167	DW NPW	"Method 8167 Chlorine, Total"
Walkley/Black	S	FOC/TOC WB
SM2320 B	DW NPW	"Alkalinity"
SM2340B	NPW	"2340 Hardness"
SM2510B	DW NPW	"2510 Conductivity"
SM2540 B	NPW	"Total Solids Dried at 103-105° C"
SM2540 C	DW NPW	"Total Dissolved Solids Dried at 180° C"
SM2540 D	NPW	"Total Suspended Solids Dried at 103-105° C"
SM4500-H+B	DW NPW	"pH Value"
SM4500-NH3 C	NPW S	"4500-NH3" Ammonia
SM4500-Norg	NPW	"4500-Norg" Total Kjeldahl Nitrogen (TKN)

C	S	
SM5210 B	NPW	"5210 B. 5-day BOD Test"
SM5310 B	DW	"5310" Total Organic Carbon (TOC)
SM9223B	NPW DW	"9223 Enzyme Substrate Coliform Test"
8000B	NPW S	"Determinative Chromatographic Separations"
8000C	NPW S	"Determinative Chromatographic Separations"

Criteria for Standard Operating Procedures

HEAL has Standard Operating Procedures (SOPs) for each of the test methods listed above. These SOPs are based upon the listed methods and detail the specific procedure and equipment utilized as well as the quality requirements necessary to prove the integrity of the data. SOPs are reviewed or revised every twelve months or sooner if necessary. The review/revision is documented in the Master SOP Logbook filed in the QA/QC Office. All SOPs are available in the LIMS under the Documents and SOPs menu.
Hand written corrections or alterations to SOPs are not permitted. In the event that a correction is needed and a revision is not immediately possible, a corrective action report will be generated documenting the correction or alteration, signed by the section Technical Director and the QA/QC Officer and will be scanned into the current SOP and will document the change until a new revision is possible.

Controlled documents such as calibration summary forms, analysis bench sheets, etc. are tracked as appendices in SOPs, through the Controlled Document Logbook with copies available through the LIMS or through the MOAL as bound logbooks.

Each HEAL test method SOP shall include or reference the following topics where applicable:

Identification of the test method;
Applicable matrix or matrices;
Limits of detection and quantitation;
Scope and application, including parameters to be analyzed;
Summary of the test method;
Definitions;
Interferences;
Safety;
Equipment and supplies;
Reagents and standards;

Sample collection, preservation, shipment and storage;
Quality control parameters;
Calibration and standardization;
Procedure;
Data analysis and calculations;
Method performance;
Pollution prevention;
Data assessment and acceptance criteria for quality control measures;
Corrective actions for out-of-control data;
Contingencies for handling out-of-control or unacceptable data;
Waste management;
References; and
Any tables, diagrams, flowcharts and validation data.

7.0 Calibration

All equipment and instrumentation used at HEAL are operated, maintained and calibrated according to manufacturers' guidelines, as well as criteria set forth in applicable analytical methodology. Personnel who have been properly trained in their procedures perform the operation and calibration. Brief descriptions of the calibration processes for our major laboratory equipment and instruments are found below.

Thermometers

The thermometers in the laboratory are used to measure the temperatures of the refrigerators, freezers, ovens, water baths, incubators, hot blocks, ambient laboratory conditions, TCLP Extractions, digestion blocks, and samples at the time of log-in. All NIST traceable thermometers are either removed from use upon their documented expiration date or they are checked annually with a NIST-certified thermometer and a correction factor is noted on each thermometer log. See the most current Login SOP for detailed procedures on this calibration procedure.

Data Loggers are used to record refrigerator temperatures. These data loggers are calibrated quarterly with NIST-certified thermometers.

The NIST thermometer should be recalibrated at least every five years or whenever the thermometer has been exposed to temperature extremes.

Refrigerators/Freezers

Each laboratory refrigerator or freezer contains a thermometer capable of measuring to a minimum precision of 0.1°C. The thermometers are kept with the bulb immersed in liquid. Each day of use, the temperatures of the refrigerators are recorded to insure that the refrigerators are within the required designated range. Samples are stored separately from the standards to reduce the risk of contamination.

See the current Catastrophic Failure SOP for the procedure regarding how to handle failed refrigerators or freezers.

Ovens

The ovens contain thermometers graduated by 1° C. The ovens are calibrated quarterly against NIST thermometers and checked each day of use as required and in whatever way is dictated by or appropriate for the method in use.

Analytical and Table Top Balances

The table top balances are capable of weighing to a minimum precision of 0.01 grams. The analytical balances are capable of weighing to a minimum precision of 0.0001 grams. Records are kept of daily calibration checks for the balances in use. Working weights are used in these checks. The balances are annually certified by an outside source and the certifications are on file with the QA/QCO.

Balances, unless otherwise indicated by method specific SOPs, will be checked each day of use with at least two weights that will bracket the working range of the balance for the day. Daily balance checks will be done using working weights that are calibrated annually against Class S weights. Class S weights are calibrated by an external provider as required. The Class S weights are used once a year, or more frequently if required, to assign values to the Working Weights. During the daily balance checks, the working weights are compared to their assigned values and must pass in order to validate the calibration of the balance. The assigned values, as well as the daily checks, for the working weights are recorded in the balance logbook for each balance.

Instrument Calibration

An instrument calibration is the relationship between the known concentrations of a set of calibration standards introduced into an analytical instrument and the measured response they produce. Calibration curve standards are a prepared series of aliquots at various known concentration levels from a primary source reference standard. Specific mathematical types of calibration techniques are outlined in SW-846 8000B and/or 8000C. The entire initial calibration must be performed prior to sample analyses.

The lowest standard in the calibration curve must be at or below the required reporting limit.

Refer to the current SOP to determine the minimum requirement for calibration points.

Most compounds tend to be linear and a linear approach should be favored when linearity is suggested by the calibration data. Non-linear calibration should be considered only when a linear approach cannot be applied. It is not acceptable to use an alternate calibration procedure when a compound fails to perform in the usual manner. When this occurs, it is indicative of instrument issues or operator error.

If a non-linear calibration curve fit is employed, a minimum of six calibration levels must be used for second-order (quadratic) curves.

When more than 5 levels of standards are analyzed in anticipation of using second-order calibration curves, all calibration points MUST be used regardless of the calibration option employed. The highest or lowest calibration point may be excluded for the purpose of narrowing the calibration range and meeting the requirements for a specific calibration option. Otherwise, unjustified exclusion of calibration data is expressly forbidden.

Initial Calibration Verification (ICV) samples are from a source independent of the calibration standards and are analyzed after calibration to verify the calibration curve.

Analytical methods vary in QC acceptance criteria. HEAL follows the method specific guidelines for QC acceptance. The specific acceptance criteria are outlined in the analytical methods and their corresponding SOPs.

pH Meter

The pH meter measures to a precision of 0.01 pH units. The pH calibration logbook contains the calibration before each use, or each day of use, if used more than once per day. It is calibrated using a minimum of 3 certified buffers. Also available with the pH meter is a magnetic stirrer with a temperature sensor. See the current pH SOP (SM4500 H+ B) for specific details regarding calibration of the pH probe.

Other Analytical Instrumentation and Equipment

The conductivity probe is calibrated as needed and checked daily when in use.

Eppendorf (or equivalent brands) pipettes are checked gravimetrically prior to use.

Standards

All of the source reference standards used are ordered from a reliable commercial vendor. A Certificate of Analysis (CoA), which verifies the quality of the standard, accompanies the standards from the vendor. The Certificates of Analysis are dated and stored on file by the Technical Directors or their designee. These standards are traceable to the National Institute of Standards (NIST). When salts are purchased and used as standards the certificate of purity must be obtained from the vendor and filed with the CoAs.

All standard solutions, calibration curve preparations, and all other quality control solutions are labeled in a manner that can be traced back to the original source reference standard. All source reference standards are entered into the LIMS with an appropriate description of the standard. Dilutions of the source reference standard (or any mixes of the source standards) are fully tracked in the LIMS. Standards are labeled with the date opened for use and with an expiration date.

As part of the quality assurance procedures at HEAL, analysts strictly adhere to manufacturer recommendations for storage times/expiration dates and policies of analytical standards and quality control solutions.

Reagents

HEAL ensures that the reagents used are of acceptable quality for their intended purpose. This is accomplished by ordering high quality reagents and adhering to good laboratory practices so as to minimize contamination or chemical degradation. All reagents must meet any specifications noted in the analytical method. Refer to the current Purchase of Consumables SOP for details on how this is accomplished and documented.

Upon receipt, all reagents are assigned a separate ID number, and logged into the LIMS. All reagents shall be labeled with the date received into the laboratory and again with the date opened for use. Recommended shelf life, as defined by the manufacturer, shall be documented and controlled. Dilutions or solutions prepared shall be clearly labeled, dated, and initialed. These solutions are traceable back to their primary reagents and do not extend beyond the expiration date listed for the primary reagent.

All gases used with an instrument shall meet specifications of the manufacturer. All safety requirements that relate to maximum and/or minimum allowed pressure, fitting types, and leak test frequency, shall be followed. When a new tank of gas is placed in use, it shall be checked for leaks and the date put in use will be written in the instrument maintenance logbook.

HEAL continuously monitors the quality of the reagent water and provides the necessary indicators for maintenance of the purification systems in order to assure that the quality of laboratory reagent water meets established criteria for all analytical methods. The majority of HEAL methods utilize medium quality deionized reagent water maintained at a resistivity greater than 1MΩ in accordance with SM1080.

Reagent blank samples are also analyzed to ensure that no contamination is present at detectable levels. The frequency of reagent blank analysis is typically the same as calibration verification samples. Refrigerator storage blanks are stored in the volatiles refrigerator for a period of one week and analyzed and replaced once a week.

8.0 Maintenance

Maintenance logbooks are kept for each major instrument and all support equipment in order to document all repair and maintenance. In the front of the logbook, the following information is included:

Unique Name of the Item or Equipment
Manufacturer
Type of Instrument
Model Number
Serial Number
Date Received and Date Placed into Service
Location of Instrument
Condition of Instrument Upon Receipt

For routine maintenance, the following information shall be included in the log:

Maintenance Date
Maintenance Description
Maintenance Performed by Initials

A manufacturer service agreement (or equivalent) covers most major instrumentation to assure prompt and reliable response to maintenance needs beyond HEAL instrument operator capabilities.

Refer to the current Maintenance and Troubleshooting SOP for each section in the laboratory for further information.

9.0 Data Integrity

For HEAL's policy on ethics and data integrity, see section 3.0 of this document. Upon being hired, and annually thereafter, all employees at HEAL undergo documented data integrity training. All new employees sign an Ethics and Data Integrity Agreement, documenting their understanding of the high standards of integrity required at HEAL and outlining their responsibilities in regards to ethics and data integrity. See the current Document Control Logbook for a copy of this agreement.

In instances of ethical concern, analysts are required to report the known or suspected concern to their Technical Director, the Laboratory Manager, or the QA/QCO. This will be done in a confidential and receptive environment, allowing all employees to privately discuss ethical issues or report items of ethical concern.

Once reported and documented, the ethical concern will be immediately elevated to the Laboratory Manager and the need for an investigation, analyst remediation, or termination will be determined on a case-by-case basis.

All reported instances of ethical concern will be thoroughly documented and handled in a manner sufficient to rectify any breaches in data integrity with an emphasis on preventing similar incidences from happening in the future.

10.0 Quality Control

Internal Quality Control Checks

HEAL utilizes various internal quality control checks, including duplicates, matrix spikes, matrix spike duplicates, method blanks, laboratory control spikes, laboratory control spike duplicates, surrogates, internal standards, calibration standards, quality control charts, proficiency tests and calculated measurement uncertainty.

Refer to the current method SOP to determine the frequency and requirements of all quality controls. In the event that the frequency of analysis is not indicated in the method specific SOP, duplicate samples, laboratory control spikes (LCS), Method Blanks (MB), and matrix spikes and matrix spike duplicates (MS/MSD) are analyzed for every batch of twenty samples.

When sample volume is limited on a test that requires an MS/MSD an LCSD shall be analyzed to demonstrate precision and accuracy and when possible a sample duplicate will be analyzed.

Duplicates are identical tests repeated for the same sample or matrix spike in order to determine the precision of the test method. A Relative Percent Difference (RPD) is calculated as a measure of this precision. Unless indicated in the SOP, the default acceptance limit is </= 20%.

Matrix Spikes and Matrix Spike Duplicates are spiked samples (MS/MSD) that are evaluated with a known added quantity of a target compound. This is to help determine the accuracy of the analyses and to determine the matrix effects on analyte recovery. A percent recovery is calculated to assess the quality of the accuracy. In the event that the acceptance criteria is not outlined in the SOP, a default limit of 70-130% will be utilized. When an MSD is employed an RPD is calculated and when not indicated in the SOP shall be acceptable at </= 20%.

> In an effort to evaluate all received matricies, MS/MSD samples are chosen randomly. Notable exceptions to this policy are when a client requests the MS/MSD be analyzed utilizing their sample or in the event the matrix requires such a significant dilution that utilizing it as an MS/MSD is impractical.

When appropriate for the method, a Method Blank should be analyzed with each batch of samples processed to assess contamination levels in the laboratory. MBs consist of all the reagents measured and treated as they are with samples, except without the samples. This enables the laboratory to ensure clean reagents and procedures. Guidelines should be in place for accepting or rejecting data based on the level of contamination in the blank. In the event that these guidelines are not dictated by the SOP or in client specific work plans, the MB should be less than the MDL reported for the analyte being reported.

It is important to note that the LIMS qualifies samples for Method Blank failures when the amount in the blank is greater than the sample's listed PQL.

A Laboratory Control Spike and Laboratory Control Spike Duplicate (LCS/LCSD) are reagent blanks, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes. It is generally used to establish intra-laboratory or analyst-specific precision and bias or to assess the performance of all or a portion of the measurement system. Guidelines are outlined in each SOP for the frequency and pass fail requirements for LCS and LCSDs. These limits can be set utilizing control charts as discussed below.

Surrogates are utilized when dictated by method and are substances with properties that mimic the analytes of interest. The surrogate is an analyte that is unlikely to be found in environmental samples. Refer to the appropriate Method and SOP for guidelines on pass/fail requirements for surrogates.

Internal Standards are utilized when dictated by the method and are known amounts of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method. Refer to the appropriate Method and SOP for guidelines on pass/fail requirements for Internal Standards.

Proficiency Test (PT) Samples are samples provided by an unbiased third party. They are typically analyzed twice a year, between five and seven months apart, or at any other interval as defined in the method SOP. They contain a pre-determined concentration of the target compound, which is unknown to HEAL. HEAL's management and all analysts shall ensure that all PT samples are handled in the same manner as real environmental samples utilizing the same staff, methods, procedures, equipment, facilities and frequency of analysis as used for routine analysis of that analyte. When analyzing a PT, HEAL shall employ the same calibration, laboratory quality control and acceptance criteria, sequence of analytical steps, number of replicates and other procedures as used when analyzing routine samples. PT results are reported as normal samples, within the working range of the associated calibration curve. In the event an analyte concentration is less than the PQL, the result shall be reported as less than the PQL.

With regards to analyzing PT Samples HEAL shall not send any PT sample, or portion of a PT sample, to another laboratory for any analysis for which we seek accreditation, or are accredited. HEAL shall not knowingly receive any PT sample or portion of a PT sample from another laboratory for any analysis for which the sending laboratory seeks accreditation, or is accredited. Laboratory management or staff will not communicate with any individual at another laboratory concerning the PT sample. Laboratory management or staff shall not attempt to obtain the assigned value of any PT sample from the PT Provider.

Upon receiving a Not Acceptable PT result for any analyte, a root cause analysis is conducted and the cause of the failure determined and corrected. As defined by TNI, two

out of the past three PTs must be acceptable to maintain accreditation for any given analyte. If this requirement is not met, a successful history will be reestablished by the analysis of an additional PT sample. For accredited tests, the PT provider will be notified, when the PT is for corrective action purposes. The analysis dates of successive PT samples for the same TNI accredited analyte shall be at least fifteen days apart.

Calibration standards are standards run to calibrate. Once the calibration is established the same standards can be analyzed as Continuing Calibration Verifications (CCV), used to confirm the consistency of the instrumentation. Calibration standards can be utilized at the beginning and end of each batch, or more frequently as required. Typically Continuing Calibration Blanks (CCB) are run in conjunction with CCVs. Refer to the current method SOP for frequency and pass/fail requirements of CCVs and CCBs.

Control Limits are limits of acceptable ranges of the values of quality control checks. The control limits approximate a 99% confidence interval around the mean recovery. Any matrix spike, surrogate, or LCS results outside of the control limits require further evaluation and assessment. This should begin with the comparison of the results from the samples or matrix spike with the LCS results. If the recoveries of the analytes in the LCS are outside of the control limits, then the problem may lie with the application of the extraction, with cleanup procedures, or with the chromatographic procedure. Once the problem has been identified and addressed, corrective action may include reanalysis of samples or re-extraction followed by reanalysis. When the LCS results are within the control limits, the issue may be related to the sample matrix or to the use of an inappropriate extraction, cleanup, and/or determinative method for the matrix. If the results are to be used for regulatory compliance monitoring, then steps must be taken to demonstrate that the analytes of concern can be determined in the sample matrix at the levels of interest. Data generated with laboratory control samples that fall outside of the established control limits are judged to be generated during an "out-of-control" situation. These data are considered suspect and shall be repeated or reported with qualifiers.

Control limits are to be updated only by Technical Directors, Section Supervisors or the Quality Assurance Officer. Control limits should be established and updated according to the requirements of the method being utilized. When the method does not specify, and control limits are to be generated or updated for a test, the following guidelines shall be utilized.

Limits should typically be generated utilizing the most recent 20-40 data values. In order to obtain an even distribution across multiple instruments and to include more than a single day's worth of data, surrogate limits should be generated using around 100 data values. The data values used shall not reuse values that were included in the previous Control Limit update. The data values shall also be reviewed by the LIMS for any Grubbs Outliers, and if identified, the outliers must be removed prior to generating new limits. The results used to update control limits should meet all other QC criteria associated with the determinative method. For example, MS/MSD recoveries from a GC/MS procedure should be generated from samples analyzed after a valid tune and a valid initial calibration that includes all

analytes of interest. Additionally, no analyte should be reported when it is beyond the working range of the calibration currently in use. MS/MSD and surrogate limits should be generated using the same set of extraction, cleanup, and analysis procedures.

All generated limits should be evaluated for appropriateness. Where limits have been established for MS/MSD samples, the LCS/LCSD limits should fall within those limits, as the LCS/LCSD are prepared in a clean matrix. Surrogate limits should be updated using all sample types and should be evaluated to ensure that all instruments as well as a reasonable dispersion across days are represented by the data. LCS/LCSD recovery limits should be evaluated to verify that they are neither inappropriately wide nor unreasonably tight. The default LCS/LCSD acceptance limits of 70-130% and RPD of 20% (or those limits specified by the method for LCS/LCSD and/or CCV acceptability), should be used to help make this evaluation. Technical directors may choose to use warning limits when they feel their generated limits are too wide (the lower limit of which cannot be <15%), or default LCS limits when they feel their limits have become arbitrarily tight.

Once new Control Limits have been established and updated in the LIMS, the Control Charts shall be printed and reviewed by the appropriate section supervisor and primary analyst performing the analysis for possible trends and compared to the previous Control Charts. The technical director initials the control charts, indicating that they have been reviewed and that the updated Limits have been determined to be accurate and appropriate. Any manual alterations to the limits will be documented and justified on the printed control chart. These initialed charts are then filed in the QA/QCO office.

Once established, control limits should be reviewed after every 20-30 data values and updated at least every six months, provided that there are sufficient points to do so. The limits used to evaluate results shall be those in place at the time that the sample was analyzed. Once limits are updated, those limits apply to all subsequent analyses.

When updating surrogate control limits, all data, regardless of sample/QC type, shall be updated together and assigned one set of limits for the same method/matrix.

In the event that there are insufficient data points to update limits that are over a year old, the default limits, as established in the method or SOP, shall be re-instated. Refer to the requirements in SW-846 method 8000B and 8000C for further guidance on generating control limits.

Calculated Measurement Uncertainty is calculated annually using LCSs in order to determine the laboratory specific uncertainty associated with each test method. These uncertainty values are available to our clients upon request and are utilized as a trending tool internally to determine the effectiveness of new variables introduced into the procedure over time.

Client Requested QC

Occasionally certain clients will require QC that is not defined by or covered in the SOPs. These special requests will be issued to all analysts and data reviewers in writing and the analysts and data reviewers will be provided with guidance on how to properly document the client requested deviation/QC in their preparation and analytical batches.

Precision, Accuracy, Detection Levels

Precision

The laboratory uses sample duplicates, laboratory control spike duplicates, and matrix spike duplicates to assess precision in terms of relative percent difference (RPD). HEAL requires the RPD to fall within the 99% confidence interval of established control charts or an RPD of less than 20% if control charts are not available. RPD's greater than these limits are considered out-of-control and require an appropriate response.

$$RPD = 2 \frac{(\text{Sample Result} - \text{Duplicate Result})}{(\text{Sample Result} + \text{Duplicate Result})} \times 100$$

Accuracy

The accuracy of an analysis refers to the difference between the calculated value and the actual value of a measurement. The accuracy of a laboratory result is evaluated by comparing the measured amount of QC reference material recovered from a sample and the known amount added. Control limits can be established for each analytical method and sample matrix. Recoveries are assessed to determine the method efficiency and/or the matrix effect.

Analytical accuracy is expressed as the Percent Recovery (%R) of an analyte or parameter. A known amount of analyte is added to an environmental sample before the sample is prepared and subsequently analyzed. The equation used to calculate percent recovery is:

$$\%Recovery = \{(concentration^* \text{ recovered})/(concentration^* \text{ added})\} \times 100$$

*or amount

HEAL requires that the Percent Recovery to fall within the 99 % confidence interval of established control limits. A value that falls outside of the confidence interval requires a warning and process evaluation. The confidence intervals are calculated by determining the mean and sample standard deviation. If control limits are not available, the range of 80 to 120% is used unless the specific method dictates

otherwise. Percent Recoveries outside of this range mandate additional action such as analyses by Method of Standard Additions, additional sample preparation(s) where applicable, method changes, and out-of-control action or data qualification.

Detection Limit

Current practices at HEAL define the Detection Limit (DL) as the smallest amount that can be detected above the baseline noise in a procedure within a stated confidence level.

HEAL presently utilizes a Method Detection Limit (MDL), and a Practical Quantitation Limit (PQL).

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The MDL is a measure of the sensitivity of an analytical method. MDL studies are required annually for each quality system matrix, technology and analyte, unless indicated otherwise in the referenced method. An MDL determination (as required in 40CFR part 136 Appendix B) consists of replicate spiked samples carried through all necessary preparation steps. The spike concentration is three times the standard deviation of three replicates of spikes. At least seven replicates are spiked and analyzed and their standard deviation(s) calculated. Routine variability is critical in passing the 10 times rule and is best achieved by running the MDLs over different days and when possible over several calibration events. Standard Methods and those methods used for drinking water analysis must have MDL studies that are performed over a period of at least three days in order to include day to day variations. The method detection limit (MDL) can be calculated using the standard deviation according to the formula:

$$MDL = s * t\ (99\%),$$

where t (99%) is the Student's t-value for the 99% confidence interval. The t-value depends on the number of trials used in calculating the sample standard deviation, so choose the appropriate value according to the number of trials.

Number of Trials	t(99%)
6	3.36
7	3.14
8	3.00
9	2.90

The calculated MDL must not be less than 10 times the spiked amount or the study must be performed again with a lower concentration.

Where there are multiple MDL values for the same test method in the LIMS the highest MDL value is utilized.

The PQL is significant because different laboratories can produce different MDLs although they may employ the same analytical procedures, instruments and sample matrices. The PQL is about two to five times the MDL and represents a practical, and routinely achievable, reporting level with a good certainty that the reported value is reliable. It is often determined by regulatory limits. The reported PQL for a sample is dependent on the dilution factor utilized during sample analysis.

In the event that an analyte will not be reported less than the PQL, an MDL study is not required and a PQL check shall be done, at least annually, in place of the MDL study. The PQL check shall consist of a QC sample spiked at or below the PQL. All sample-processing and analysis steps of the analytical method shall be included in the PQL check and shall be done for each quality system matrix, technology, and analyte. A successful check is one where the recovery of each analyte is within the established method acceptance criteria. When this criterion is not defined by the method or SOP, a default limit of +/-50% shall be utilized.

Quality Control Parameter Calculations

Mean

The sample mean is also known as the arithmetic average. It can be calculated by adding all of the appropriate values together, and dividing this sum by the number of values.

$$\text{Average} = (\Sigma x_l) / n$$

x_l = the value x in the l^{th} trial
n = the number of trials

Standard Deviation

The sample standard deviation, represented by s, is a measure of dispersion. The dispersion is considered to be the difference between the average and each of the values x_i. The variance, s^2, can be calculated by summing the squares of the differences and dividing by the number of differences. The sample standard deviation, s, can be found by taking the square root of the variance.

Standard deviation = s = $[\Sigma (x_i - \text{average})^2 / (n - 1)]^{1/2}$

Percent Recovery (LCS and LCSD)

$$\text{Percent Recovery} = \frac{\text{(Spike Sample Result)}}{\text{(Spike Added)}} \times 100$$

Percent Recovery (MS, MSD)

$$\text{Percent Recovery} = \frac{\text{(Spike Sample Result – Sample Result)}}{\text{(Spike Added)}} \times 100$$

Control Limits

Control Limits are calculated by the LIMS using the average percent recovery (x), and the standard deviation (s).

Upper Control Limit = x + 3s
Lower Control Limit = x – 3s

These control limits approximate a 99% confidence interval around the mean recovery.

Grubbs Outliers

Grubbs Outliers are calculated by the LIMS during the generation of control limits and uncertainties. An outlier is an observation that appears to deviate markedly from other observations in the sample set and are removed, unless documented otherwise.

Identify both the lowest and highest values in the sample set. Use the following equations to determine the T values.

$$T = \frac{x_{max} - x_{mean}}{sd} \quad \text{(for the largest value)}$$

$$T = \frac{x_{mean} - x_{min}}{sd} \quad \text{(for the smallest value)}$$

Compare the T values to the Grubbs' critical value table. If either value of T is greater than the critical value (assuming a 5% risk) for the sample size, the point(s) must be dropped then the calculation repeated for both the lowest and highest value using the new mean and standard deviation.
The Grubbs test is repeated until there are no longer any outliers detected. Keep in mind you must have at least 20 data points available to generate your limits.

RPD (Relative Percent Difference)

Analytical precision is expressed as a percentage of the difference between the results of duplicate samples for a given analyst. Relative percent difference (RPD) is calculated as follows:

$$RPD = 2 \times \frac{(\text{Sample Result} - \text{Duplicate Result})}{(\text{Sample Result} + \text{Duplicate Result})} \times 100$$

Uncertainty Measurements

Uncertainty, as defined by ISO, is the parameter associated with the result of a measurement that characterizes the dispersion of the values that could reasonably be attributed to the measurement. Ultimately, uncertainty measurements are used to state how good a test result is and to allow the end user of the data to properly interpret their reported data. All procedures allow for some uncertainty. For most analyses, the components and estimates of uncertainty are reduced by following well-established test methods. To further reduce uncertainty, results generally are not reported below the lowest calibration point (PQL) or above the highest calibration point (UQL). Understanding that there are many influential quantities affecting a measurement result, so many in fact that it is impossible to identify all of them, HEAL calculates measurement uncertainty at least annually using LCSs. These estimations of measurement uncertainty are kept on file in the method folders in the QA/QC office.

Measurement Uncertainty contributors are those that may be determined statistically. These shall be generated by estimating the overall uncertainty in the entire analytical process by measuring the dispersion of values obtained from laboratory control samples over time. At least 20 of the most recent LCS data points are gathered. The standard deviation(s) is calculated using these LCS data points. Since it can be assumed that the possible estimated values of the spikes are approximately normally distributed with approximate standard deviation(s), the unknown value of the spike is believed to lie in 95% confidence interval, corresponding to an uncertainty range of +/- 2(s).

Calculate standard deviation (s) and 95% confidence interval according to the following formulae:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{(n-1)}}$$

Where: s = standard deviation
x = number in series
$\bar{x}$ = calculated mean of series
n = number of samples taken

$$95\%\ confidence = 2 \times s$$

Example: Assuming that after gathering 20 of the most recent LCS results for Bromide, we have calculated the standard deviations of the values and achieved a result of 0.0326, our measurement of uncertainty for Bromide (at 95% confidence = 2 x s) is 0.0652.

Total Nitrogen

Total nitrogen is calculated as follows:

Total Nitrogen = TKN + NO_2 + NO_3

Langelier Saturation Index

The Langelier Saturation Index (LSI) is calculated as follows:

Solids Factor (SF) =(Log10[TDS] - 1) / 10
Ca Hardness Factor (HF) = Log10([Ca] x 2.497) - 0.4
Alkalinity Factor (AF) = Log10[Alkalinity]
Temp. Factor (TF) = -13.12 x Log10(°C + 273) + 34.55
pHs (pH @ saturation) =(9.3 + SF + TF) - (HF + AF)
LSI = pH - pH_s

Calibration Calculations

1. Response Factor or Calibration Factor:

$$RF = ((A_x)(C_{is}))/((A_{is})(C_x)) \qquad CF = (A_x)/(C_x)$$

a. Average RF or CF

$$RF_{AVE} = \Sigma RF_i / n$$

b. Standard Deviation

$$s = SQRT \{ [\Sigma (RF_i - RF_{AVE})^2] / (n-1) \}$$

c. Relative Standard Deviation

$$RSD = s / RF_{AVE}$$

Where:
A_x = Area of the compound
C_x = Concentration of the compound
A_{is} = Area of the internal standard
C_{is} = Concentration of the internal standard
n = number of pairs of data
RF_i = Response Factor (or other determined value)
RF_{AVE} = Average of all the response factors
Σ = the sum of all the individual values

2. Linear Regression

$$y = mx + b$$

a. Slope (m)

$$m = (n\Sigma x_i y_i - (n\Sigma x_i)*(n\Sigma y_i)) / (n\Sigma x_i^2 - (\Sigma x_i)^2)$$

b. Intercept (b)

$$b = y_{AVE} - m*(x_{AVE})$$

c. Correlation Coefficient (cc)

$$CC\ (r) = \{ \Sigma((x_i - x_{ave})*(y_i - y_{ave})) \} / \{ SQRT((\Sigma(x_i - x_{ave})^2)*(\Sigma(y_i - y_{ave})^2)) \}$$

Or

$$CC\ (r) = [(\Sigma w * \Sigma wxy) - (\Sigma wx * \Sigma wy)] / (sqrt(([(\Sigma w * \Sigma wx^2) - (\Sigma wx * \Sigma wx)] * [(\Sigma w * \Sigma wy^2) - (\Sigma wy * \Sigma wy)])))]$$

d. Coefficient of Determination

$$COD\ (r^2) = CC*CC$$

Where:
y = Response (Area) Ratio A_x/A_{is}
x = Concentration Ratio C_x/C_{is}
m = slope
b = intercept
n = number of replicate x,y pairs
x_i = individual values for independent variable
y_i = individual values for dependent variable
Σ = the sum of all the individual values
x_{ave} = average of the x values
y_{ave} = average of the y values
w = weighting factor, for equal weighting w=1

3. Quadratic Regression

$$y = ax^2 + bx + c$$

a. Coefficient of Determination

$$COD\ (r^2) = (\Sigma(y_i - y_{ave})^2 - \{[(n-1)/(n-p)] * [\Sigma(y_i - Y_i)^2]\}) / \Sigma(y_i - y_{ave})^2$$

Where:
y = Response (Area) Ratio A_x/A_{is}
x = Concentration Ratio C_x/C_{is}
a = x^2 coefficient
b = x coefficient
c = intercept
y_i = individual values for each dependent variable
x_i = individual values for each independent variable
y_{ave} = average of the y values
n = number of pairs of data
p = number of parameters in the polynomial equation (I.e., 3 for third order, 2 for second order)

$Yi = ((2*a*(C_x/C_{is})^2)-b^2+b+(4*a*c))/(4a)$

b. Coefficients (a,b,c) of a Quadratic Regression

$a = S_{(x2y)}S_{(xx)}-S_{(xy)}S_{(xx2)} / S_{(xx)}S_{(x2x2)}-[S_{(xx2)}]^2$

$b = S_{(xy)}S_{(x2x2)}-S_{(x2y)}S_{(xx2)} / S_{(xx)}S_{(x2x2)}-[S_{(xx2)}]^2$

$c = [(\Sigma yw)/n] - b*[(\Sigma xw)/n] - a*[\Sigma(x^2w)/n]$

Where:
n = number of replicate x,y pairs
x = x values
y = y values
$w = S^{-2} / (\Sigma S^{-2}/n)$
$S_{(xx)} = (\Sigma x^2w) - [(\Sigma xw)^2 / n]$
$S_{(xy)} = (\Sigma xyw) - [(\Sigma xw)*(\Sigma yw) / n]$
$S_{(xx2)} = (\Sigma x^3w) - [(\Sigma xw)*(\Sigma x^2w) / n]$
$S_{(x2y)} = (\Sigma x^2yw) - [(\Sigma x^2w)*(\Sigma yw) / n]$
$S_{(x2x2)} = (\Sigma x^4w) - [(\Sigma x^2w)^2 / n]$
Or If unweighted calibration, w=1
S(xx) = (Sx2) - [(Sx)2 / n]
S(xy) = (Sxy) - [(Sx)*(Sy) / n]
S(xx2) = (Sx3) - [(Sx)*(Sx2) / n]
S(x2y) = (Sx2y) - [(Sx2)*(Sy) / n]
S(x2x2) = (Sx4) - [(Sx2)2 / n]

Weighting

Weighting of $1/x$ or $1/x^2$ is permissible for linear calibrations. Weighting shall not be employed for quadratic calibrations. When weighting, use the above equations by substituting x for $1/x$ or $1/x^2$.

Concentration Calculations

On-Column Concentration for Average RRF Calibration using Internal Standard

On-Column Concentration $C_x = ((A_x)(C_{is}))/((A_{is})(RF_{AVE}))$

On-Column Concentration for Average CF Calibration using External Standard

On-Column Concentration $C_x = (A_x)/(CF_{AVE})$

On-Column Concentration for Linear Calibration

If determining an external standard, then exclude the A_{is} and C_{is} for internal standards

On-Column Concentration $C_x = ((\text{Absolute}\{[(A_x)/(A_{is})] - b\})/m) * C_{is}$

Where: m = slope
b = intercept
A_x = Area of the Sample
C_{is} = Concentration of the Internal Standard
A_{is} = Area of the Internal Standard

On-Column Concentration for Quadratic Calibration

If determining an external standard, then exclude the A_{is} and C_{is} for internal standards

On-Column Concentration $=[(+SQRT(b^2-(4*a*(c-y)))-b)/(2*a)] * C_{is}$

Where: a = x^2 coefficient
b = x coefficient
c = intercept
y = Area Ratio = A_x/A_{is}
C_{is} = Concentration of the Internal Standard

Final Concentration (Wet Weight)

$$\text{Concentration for Extracted Samples} = \frac{(\text{On-Column Conc})(\text{Dilution})(\text{Final Volume})}{(\text{Initial Amount})(\text{Injection Volume})}$$

$$\text{Concentration for Purged Samples} = \frac{(\text{On-Column Conc})(\text{Purged Amount})(\text{Dilution})}{(\text{Purged Amount})}$$

Dry Weight Concentration

$$\text{Dry Weight Concentration} = \frac{\text{Final Concentration Wet Weight} * 100}{\% \text{ Solids}}$$

Percent Difference

$$\% \text{ Difference} = \frac{\text{Absolute(Continuing Calibration RRF - Average RRF)}}{\text{Average RRF}} * 100$$

Percent Drift

$$\% \text{ Drift} = \frac{\text{Absolute(Calculated Concentration - Theoretical Concentration)}}{\text{Theoretical Concentration}} * 100$$

Dilution Factor

Dilution Factor =(Volume of Solvent + Solute) / Volume of Solute

Relative Retention Time

RRT =RT of Compound / RT of ISTD

Breakdown Percent

$$\text{Breakdown} = \frac{\text{Area of DDD + Area of DDE}}{\text{Average (DDT, DDE and DDD)}}$$

-or-

$$\frac{\text{Area of Endrin Ketone + Area of Endrin Aldehyde}}{\text{Average (Endrin, Endrin Ketone, Endrin Aldehyde)}}$$

11.0 Data Reduction, Validation, Reporting, and Record Keeping

All data reported must be of the highest possible accuracy and quality. During the processes of data reduction, validation, and report generation, all work is thoroughly checked to insure that error is minimized.

Data Reduction

The analyst who generated the data usually performs the data reduction. The calculations include evaluation of surrogate recoveries (where applicable), and other miscellaneous calculations related to the sample quantitation.

If the results are computer generated, then the formulas must be confirmed by hand calculations, at minimum, one per batch.

See the current Data Validation SOP for details regarding data reduction.

Validation

A senior analyst, most often the section supervisor, validates the data. All data undergoes peer review. If an error is detected, it is brought to the analyst's attention so that he or she can rectify the error, and perform further checks to ensure that all data for that batch is sound. Previous and/or common mistakes are stringently monitored throughout the validation process. Data is reported using appropriate significant figure criteria. In most cases, two significant digits are utilized, but three significant digits can be used in QC calculations. Significant digits are not rounded until after the last step of a sample calculation. All final reports undergo a review by the laboratory manager, the project manager, or their designee, to provide a logical review of all results before they are released to the client.

If data is to be manually transferred between media, the transcribed data is checked by a peer. This includes data typing, computer data entry, chromatographic data transfer, data table inclusion to a cover letter, or when data results are combined with other data fields.

All hand-written data from run logs, analytical standard logbooks, hand-entered data logbooks, or on instrument-generated chromatograms, are systematically archived should the need for future retrieval arise.

See the current Data Validation SOP for details regarding data validation.

Reports and Records

All records at HEAL are retained and maintained through the procedures outlined in the most recent version of the Records Control SOP.

Sample reports are compiled by the Laboratory Information Management System (LIMS). Most data is transferred directly from the instruments to the LIMS. After being processed by the analyst and reviewed by a data reviewer, final reports are approved and signed by the senior laboratory management. A comparative analysis of the data is performed at this point. For example, if TKN and NH3 are analyzed on the same sample, the NH3 result should never be greater than the TKN result. Lab results and reports are released only to appropriately designated individuals. Release of the data can be by fax, email, electronic deliverables, or mailed hard copy.

When a project is completed, the final report, chain of custody, any relevant supporting data, and the quality assurance/control worksheets are scanned as a .pdf file onto the main server. Original client folders are kept on file and are arranged by project number. Additionally, all electronic data is backed up routinely on the HEAL main server. The backup includes raw data, chromatograms, and report documents. Hard copies of chromatograms are stored separately according to the instrument and the analysis date. All records and analytical data reports are retained in a secure location as permanent records for a minimum period of five years (unless specified otherwise in a client contract). Access to archived information shall be documented with an access log. Access to archived electronic reports and data will be password protected. In the event that HEAL transfers ownership or terminates business practices, complete records will be maintained or transferred according to the client's instructions.

After issuance, the original report shall remain unchanged. If a correction to the report is necessary, then an additional document shall be issued. This document shall have a title of "Addendum to Test Report or Correction to Original Report", or equivalent. Demonstration of original report integrity comes in two forms. First, the report date is included on each page of the final report. Second, each page is numbered in sequential order, making the addition or omission of any data page(s) readily detectable.

When final Arizona Compliance work order reports contain data analyzed at sub-contracted laboratories, the final report to the client will include the sub-contracted laboratories report in its entirety. This includes but is not limited to cover sheets, qualifiers, data, chain of custodies and any included QC. All sub-contracted data is scanned into the LIMS and archived through the same process as in-house generated records.

12.0 Corrective Action

Refer to the most recent version of the Data Validation SOP for the procedure utilized in filling out a Corrective Action Report. A blank copy of the corrective action report is available in the current Document Control Logbook.

The limits that have been defined for data acceptability also form the basis for corrective action initiation. Initiation of corrective action occurs when the data generated from continuing calibration standard, sample surrogate recovery, laboratory control spike, matrix spike, or sample duplicates exceed acceptance criteria. If corrective action is necessary, the analyst or the section supervisor will coordinate to take the following guidelines into consideration in order to determine and correct the measurement system deficiency:

Check all calculations and data measurements systems (Calibrations, reagents, instrument performance checks, etc.).

Assure that proper procedures were followed.

Unforeseen problems that arise during sample preparation and/or sample analysis that lead to treating a sample differently from documented procedures shall be documented with a corrective action report. The section supervisor and laboratory manager shall be made aware of the problem at the time of the occurrence. See the appropriate SOP regarding departures from documented procedures.

Continuing calibration standards below acceptance criteria cannot be used for reporting analytical data unless method specific criteria states otherwise.

Continuing calibration standards above acceptance criteria can be used to report data as long as the failure is isolated to a single standard and the corresponding samples are non-detect for the failing analyte.

Samples with non-compliant surrogate recoveries should be reanalyzed, unless deemed un-necessary by the supervisor for matrix, historical data, or other analysis-related anomalies.

Laboratory and Matrix Spike acceptance criteria vary significantly depending on method and matrix. Analysts and supervisors meet and discuss appropriate corrective action measures as spike failures occur.

In the event that results must be reported with associated QC failures, the data must be qualified appropriately to notify the end user of the QC failure.

Sample duplicates with RPD values outside control limits require supervisor evaluation and possible reanalysis.

A second mechanism for initiation of corrective action is that resulting from Quality Assurance performance audits, system audits, inter- and intra-laboratory comparison studies. Corrective Actions initiated through this mechanism will be monitored and coordinated by the laboratory QA/QCO.

All corrective action forms are entered in the LIMS and included with the raw data for peer review, signed by the technical director of the section and included in the case narrative to the client whose samples were affected. All Corrective action forms in the LIMS are reviewed by the QA/QCO.

13.0 Quality Assurance Audits, Reports and Complaints

Internal/External Systems' Audits, Performance Evaluations, and Complaints

Several procedures are used to assess the effectiveness of the quality control system. One of these methods includes internal performance evaluations, which are conducted by the use of control samples, replicate measurements, and control charts. External performance audits, which are conducted by the use of inter-laboratory checks, such as participation in laboratory evaluation programs and performance evaluation samples available from a NELAC-accredited Proficiency Standard Vendor, are another method.

Proficiency samples will be obtained twice per year from an appropriate vendor for all tests and matrices for which we are accredited and for which PTs are available. HEAL participates in soil, waste water, drinking water, and underground storage tank PT studies. Copies of results are available upon request. HEAL's management and all analysts shall ensure that all PT samples are handled in the same manner as real environmental samples utilizing the same staff, methods, procedures, equipment, facilities, and frequency of analysis as used for routine analysis of that analyte. When analyzing a PT, HEAL shall employ the same calibration, laboratory quality control and acceptance criteria, sequence of analytical steps, number of replicates, and other procedures as used when analyzing routine samples.

With regards to analyzing PT Samples, HEAL shall not send any PT sample, or portion of a PT sample, to another laboratory for any analysis for which we seek accreditation, or are accredited. HEAL shall not knowingly receive any PT sample or portion of a PT sample from another laboratory for any analysis for which the sending laboratory seeks accreditation, or is accredited. Laboratory management or staff will not communicate with any individual at another laboratory concerning the PT sample. Laboratory management or staff shall not attempt to obtain the assigned value of any PT sample from the PT Provider.

Internal Audits are performed annually by the QA/QCO in accordance with the current Internal Audit SOP. The system audit consists of a qualitative inspection of the QA system in the laboratory and an assessment of the adequacy of the physical facilities for sampling, calibration, and measurement. This audit includes a careful evaluation and review of laboratory quality control procedures. Internal audits are performed using the guidelines outlined below, which include, but are not limited to:

1. Review of staff qualifications, demonstration of capability, and personnel training programs
2. Storage and handling of reagents, standards, and samples
3. Standard preparation logbook and LIMS procedures
4. Extraction logbooks
5. Raw data logbooks
6. Analytical logbooks or batch printouts and instrument maintenance logbooks

7. Data review procedures
8. Corrective action procedures
9. Review of data packages, which is performed regularly by the lab manager/QA Officer.

The QA/QCO will conduct these audits on an annual basis.

Management Reviews

HEAL management shall periodically, and at least annually, conduct a review of the laboratory's quality system and environmental testing activities to ensure their continuing suitability and effectiveness, and to introduce necessary changes or improvements. The review shall take account of:

1. the suitability and implementation of policies and procedures
2. reports from managerial and supervisory personnel
3. the outcome of recent internal audits
4. corrective and preventive actions
5. assessments by external bodies
6. the results of inter-laboratory comparisons or proficiency tests
7. changes in volume and type of work
8. client feed back
9. complaints
10. other relevant factors, such as laboratory health and safety, QC activities, resources, and staff training.

Findings from management reviews and the actions that arise from them shall be recorded and any corrective actions that arise shall be completed in an appropriate and agreed upon timescale.

Complaints

Complaints from clients are documented and given to the laboratory manager. The lab manager shall review the information and contact the client. If doubt is raised concerning the laboratory's policies or procedures, then an audit of the section or sections may be performed. All records of complaints and subsequent actions shall be maintained in the client compliant logbook for five years unless otherwise stated.

Internal and External Reports

The QA/QCO is responsible for preparation and submission of quality assurance reports to the appropriate management personnel as problems and issues arise. These reports

include the assessment of measurement systems, data precision and accuracy, and the results of performance and system audits. Additionally, they include significant QA problems, corrective actions, and recommended resolution measures. Reports of these Quality Assurance Audits describe the particular activities audited, procedures utilized in the examination and evaluation of laboratory records, and data validation procedures. Finally, there are procedures for evaluating the performance of Quality Control and Quality Assurance activities, and laboratory deficiencies and the implementation of corrective actions with the review requirements.

14.0 References (Analytical Protocols Utilized at HEAL)

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11. The Merck Index, Eleventh Edition, Merck & Co., Inc. 1989.

12. Methods for Chemical Analysis of Water and Wastes, USEPA, EPA-600/4-79-020, March 1979 and as amended December, 1982 (EPA-600/4-82-055)

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17. Quality Systems for Analytical Services, Revision 2.2, U.S. Department of Energy, October 2006.

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21. Standard Methods for the Examination of Water and Wastewater:
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    b. APHA, AWWA, and WEF; 21st Edition, 2005
    c. APHA, AWWA, and WEF; 22nd Edition, 2011
    d. APHA, AWWA, and WEF; Online

22. Technical Notes on Drinking Water Methods, U.S. Environmental Protection Agency, October 1994.

23. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, USEPA SW-846, 3rd Edition, Updates I, II, IIA, IIB, III, December, 1996.

Appendix D

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 20, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL:
FAX

RE: River Terrace Low Flow 4/28/16 OrderNo.: 1604C71

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 6 sample(s) on 4/29/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: TP-5
Project: River Terrace Low Flow 4/28/16
Collection Date: 4/28/2016 9:50:00 AM
Lab ID: 1604C71-001
Matrix: AQUEOUS
Received Date: 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**
Diesel Range Organics (DRO)	1.4	0.20		mg/L	1	5/2/2016 2:51:49 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/2/2016 2:51:49 PM
Surr: DNOP	104	63.2-161		%Rec	1	5/2/2016 2:51:49 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	11	0.50		mg/L	10	4/29/2016 5:14:49 PM
Surr: BFB	193	66.4-120	S	%Rec	10	4/29/2016 5:14:49 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**
Lead	0.027	0.0050		mg/L	1	5/3/2016 11:42:43 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	ND	10		µg/L	10	4/29/2016 7:18:15 PM
Toluene	ND	10		µg/L	10	4/29/2016 7:18:15 PM
Ethylbenzene	300	10		µg/L	10	4/29/2016 7:18:15 PM
Methyl tert-butyl ether (MTBE)	ND	10		µg/L	10	4/29/2016 7:18:15 PM
Xylenes, Total	1800	15		µg/L	10	4/29/2016 7:18:15 PM
Surr: 1,2-Dichloroethane-d4	96.1	70-130		%Rec	10	4/29/2016 7:18:15 PM
Surr: 4-Bromofluorobenzene	107	70-130		%Rec	10	4/29/2016 7:18:15 PM
Surr: Dibromofluoromethane	100	70-130		%Rec	10	4/29/2016 7:18:15 PM
Surr: Toluene-d8	101	70-130		%Rec	10	4/29/2016 7:18:15 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: DW-3
Project: River Terrace Low Flow 4/28/16
Collection Date: 4/28/2016 10:35:00 AM
Lab ID: 1604C71-002 **Matrix:** AQUEOUS **Received Date:** 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**
Diesel Range Organics (DRO)	0.35	0.20		mg/L	1	5/2/2016 3:56:37 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/2/2016 3:56:37 PM
Surr: DNOP	101	63.2-161		%Rec	1	5/2/2016 3:56:37 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.33	0.050		mg/L	1	5/2/2016 4:43:59 PM
Surr: BFB	322	66.4-120	S	%Rec	1	5/2/2016 4:43:59 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**
Lead	0.014	0.0050		mg/L	1	5/3/2016 11:47:00 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**
Benzene	4.9	1.0		µg/L	1	5/5/2016 2:41:22 PM
Toluene	ND	1.0		µg/L	1	5/5/2016 2:41:22 PM
Ethylbenzene	34	1.0		µg/L	1	5/5/2016 2:41:22 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	5/5/2016 2:41:22 PM
Xylenes, Total	11	1.5		µg/L	1	5/5/2016 2:41:22 PM
Surr: 1,2-Dichloroethane-d4	94.9	70-130		%Rec	1	5/5/2016 2:41:22 PM
Surr: 4-Bromofluorobenzene	88.4	70-130		%Rec	1	5/5/2016 2:41:22 PM
Surr: Dibromofluoromethane	86.8	70-130		%Rec	1	5/5/2016 2:41:22 PM
Surr: Toluene-d8	97.4	70-130		%Rec	1	5/5/2016 2:41:22 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** MW-49
Project: River Terrace Low Flow 4/28/16 **Collection Date:** 4/28/2016 11:25:00 AM
Lab ID: 1604C71-003 **Matrix:** AQUEOUS **Received Date:** 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	5/2/2016 4:18:19 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/2/2016 4:18:19 PM
Surr: DNOP	101	63.2-161		%Rec	1	5/2/2016 4:18:19 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	4/29/2016 6:52:20 PM
Surr: BFB	92.5	66.4-120		%Rec	1	4/29/2016 6:52:20 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**
Lead	0.040	0.0050		mg/L	1	5/3/2016 11:48:24 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	ND	1.0		µg/L	1	4/29/2016 9:13:03 PM
Toluene	ND	1.0		µg/L	1	4/29/2016 9:13:03 PM
Ethylbenzene	ND	1.0		µg/L	1	4/29/2016 9:13:03 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	4/29/2016 9:13:03 PM
Xylenes, Total	ND	1.5		µg/L	1	4/29/2016 9:13:03 PM
Surr: 1,2-Dichloroethane-d4	97.2	70-130		%Rec	1	4/29/2016 9:13:03 PM
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	4/29/2016 9:13:03 PM
Surr: Dibromofluoromethane	91.0	70-130		%Rec	1	4/29/2016 9:13:03 PM
Surr: Toluene-d8	106	70-130		%Rec	1	4/29/2016 9:13:03 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: TP-6
Project: River Terrace Low Flow 4/28/16
Collection Date: 4/28/2016 12:00:00 PM
Lab ID: 1604C71-004
Matrix: AQUEOUS
Received Date: 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**
Diesel Range Organics (DRO)	0.75	0.20		mg/L	1	5/2/2016 4:40:04 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/2/2016 4:40:04 PM
Surr: DNOP	101	63.2-161		%Rec	1	5/2/2016 4:40:04 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.99	0.050		mg/L	1	4/29/2016 10:08:43 PM
Surr: BFB	579	66.4-120	S	%Rec	1	4/29/2016 10:08:43 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**
Lead	0.033	0.0050		mg/L	1	5/3/2016 11:49:56 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	ND	1.0		µg/L	1	4/29/2016 9:41:53 PM
Toluene	ND	1.0		µg/L	1	4/29/2016 9:41:53 PM
Ethylbenzene	68	1.0		µg/L	1	4/29/2016 9:41:53 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	4/29/2016 9:41:53 PM
Xylenes, Total	ND	1.5		µg/L	1	4/29/2016 9:41:53 PM
Surr: 1,2-Dichloroethane-d4	91.5	70-130		%Rec	1	4/29/2016 9:41:53 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	4/29/2016 9:41:53 PM
Surr: Dibromofluoromethane	91.3	70-130		%Rec	1	4/29/2016 9:41:53 PM
Surr: Toluene-d8	106	70-130		%Rec	1	4/29/2016 9:41:53 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: TP-8
Project: River Terrace Low Flow 4/28/16
Collection Date: 4/28/2016 1:35:00 PM
Lab ID: 1604C71-005
Matrix: AQUEOUS
Received Date: 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**
Diesel Range Organics (DRO)	1.0	0.20		mg/L	1	5/2/2016 5:01:57 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/2/2016 5:01:57 PM
Surr: DNOP	95.1	63.2-161		%Rec	1	5/2/2016 5:01:57 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	2.9	0.25		mg/L	5	4/29/2016 10:33:24 PM
Surr: BFB	187	66.4-120	S	%Rec	5	4/29/2016 10:33:24 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**
Lead	0.034	0.0050		mg/L	1	5/3/2016 11:51:17 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	ND	5.0		µg/L	5	4/29/2016 10:10:39 PM
Toluene	ND	5.0		µg/L	5	4/29/2016 10:10:39 PM
Ethylbenzene	29	5.0		µg/L	5	4/29/2016 10:10:39 PM
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	5	4/29/2016 10:10:39 PM
Xylenes, Total	26	7.5		µg/L	5	4/29/2016 10:10:39 PM
Surr: 1,2-Dichloroethane-d4	91.9	70-130		%Rec	5	4/29/2016 10:10:39 PM
Surr: 4-Bromofluorobenzene	94.3	70-130		%Rec	5	4/29/2016 10:10:39 PM
Surr: Dibromofluoromethane	85.3	70-130		%Rec	5	4/29/2016 10:10:39 PM
Surr: Toluene-d8	107	70-130		%Rec	5	4/29/2016 10:10:39 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: TP-9
Project: River Terrace Low Flow 4/28/16
Collection Date: 4/28/2016 2:30:00 PM
Lab ID: 1604C71-006
Matrix: AQUEOUS
Received Date: 4/29/2016 7:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	5/2/2016 5:23:42 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/2/2016 5:23:42 PM
Surr: DNOP	112	63.2-161		%Rec	1	5/2/2016 5:23:42 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.092	0.050		mg/L	1	4/29/2016 11:22:38 PM
Surr: BFB	131	66.4-120	S	%Rec	1	4/29/2016 11:22:38 PM
EPA 6010B: TOTAL RECOVERABLE METALS						Analyst: **MED**
Lead	0.052	0.0050		mg/L	1	5/3/2016 11:52:45 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	ND	1.0		µg/L	1	4/29/2016 10:39:22 PM
Toluene	ND	1.0		µg/L	1	4/29/2016 10:39:22 PM
Ethylbenzene	ND	1.0		µg/L	1	4/29/2016 10:39:22 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	4/29/2016 10:39:22 PM
Xylenes, Total	ND	1.5		µg/L	1	4/29/2016 10:39:22 PM
Surr: 1,2-Dichloroethane-d4	96.4	70-130		%Rec	1	4/29/2016 10:39:22 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	4/29/2016 10:39:22 PM
Surr: Dibromofluoromethane	95.0	70-130		%Rec	1	4/29/2016 10:39:22 PM
Surr: Toluene-d8	105	70-130		%Rec	1	4/29/2016 10:39:22 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604C71**

20-May-16

Client: Western Refining Southwest, Inc.

Project: River Terrace Low Flow 4/28/16

Sample ID **1604C71-001CMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **TP-5**	Batch ID: **25096**	RunNo: **33916**							
Prep Date: **5/2/2016**	Analysis Date: **5/2/2016**	SeqNo: **1045539**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.8	0.20	2.500	1.389	97.9	73.3	174			
Surr: DNOP	0.24		0.2500		97.1	63.2	161			

Sample ID **1604C71-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **TP-5**	Batch ID: **25096**	RunNo: **33916**							
Prep Date: **5/2/2016**	Analysis Date: **5/2/2016**	SeqNo: **1045540**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.8	0.20	2.500	1.389	98.1	73.3	174	0.154	20	
Surr: DNOP	0.24		0.2500		94.4	63.2	161	0	0	

Sample ID **LCS-25096**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **LCSW**	Batch ID: **25096**	RunNo: **33916**							
Prep Date: **5/2/2016**	Analysis Date: **5/2/2016**	SeqNo: **1045546**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.3	0.20	2.500	0	93.7	65.4	162			
Surr: DNOP	0.20		0.2500		80.3	63.2	161			

Sample ID **MB-25096**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **PBW**	Batch ID: **25096**	RunNo: **33916**							
Prep Date: **5/2/2016**	Analysis Date: **5/2/2016**	SeqNo: **1045547**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.40		0.5000		79.6	63.2	161			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604C71**

20-May-16

Client: Western Refining Southwest, Inc.

Project: River Terrace Low Flow 4/28/16

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **A33897**	RunNo: **33897**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044018** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		90.1	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **A33897**	RunNo: **33897**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044019** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.45	0.050	0.5000	0	90.7	80	120			
Surr: BFB	21		20.00		105	66.4	120			

Sample ID **1604C71-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **TP-5**	Batch ID: **A33897**	RunNo: **33897**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044021** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	16	0.50	5.000	11.09	96.7	70	130			
Surr: BFB	410		200.0		203	66.4	120			S

Sample ID **1604C71-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **TP-5**	Batch ID: **A33897**	RunNo: **33897**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044022** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	16	0.50	5.000	11.09	91.0	70	130	1.81	20	
Surr: BFB	400		200.0		201	66.4	120	0	0	S

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **R33934**	RunNo: **33934**
Prep Date:	Analysis Date: **5/2/2016**	SeqNo: **1045461** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		88.5	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **R33934**	RunNo: **33934**
Prep Date:	Analysis Date: **5/2/2016**	SeqNo: **1045462** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- B Analyte detected in the associated Method Blank
- D Sample Diluted Due to Matrix
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S % Recovery outside of range due to dilution or matrix
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604C71**

20-May-16

Client: Western Refining Southwest, Inc.

Project: River Terrace Low Flow 4/28/16

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSW**	Batch ID:	**R33934**		RunNo:	**33934**					
Prep Date:		Analysis Date:	**5/2/2016**		SeqNo:	**1045462**	Units:	**mg/L**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		0.46	0.050	0.5000	0	92.6	80	120			
Surr: BFB		19		20.00		96.5	66.4	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604C71**

20-May-16

Client: Western Refining Southwest, Inc.

Project: River Terrace Low Flow 4/28/16

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R33898**	RunNo: **33898**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044053** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.5		10.00		94.6	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	9.0		10.00		90.0	70	130			
Surr: Toluene-d8	11		10.00		107	70	130			

Sample ID **100ng lcs3**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R33898**	RunNo: **33898**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044054** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	90.5	70	130			
Toluene	19	1.0	20.00	0	93.7	70	130			
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.4	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	10		10.00		99.9	70	130			

Sample ID **1604c71-001ams**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **TP-5**	Batch ID: **R33898**	RunNo: **33898**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044070** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	180	10	200.0	1.024	88.2	70	130			
Toluene	190	10	200.0	1.702	93.8	70	130			
Surr: 1,2-Dichloroethane-d4	97		100.0		97.0	70	130			
Surr: 4-Bromofluorobenzene	98		100.0		97.5	70	130			
Surr: Dibromofluoromethane	100		100.0		103	70	130			
Surr: Toluene-d8	100		100.0		99.9	70	130			

Sample ID **1604c71-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **TP-5**	Batch ID: **R33898**	RunNo: **33898**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044071** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	170	10	200.0	1.024	85.5	70	130	3.03	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604C71**

20-May-16

Client: Western Refining Southwest, Inc.

Project: River Terrace Low Flow 4/28/16

Sample ID **1604c71-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **TP-5**	Batch ID: **R33898**	RunNo: **33898**
Prep Date:	Analysis Date: **4/29/2016**	SeqNo: **1044071** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	190	10	200.0	1.702	95.3	70	130	1.59	20	
Surr: 1,2-Dichloroethane-d4	95		100.0		95.1	70	130	0	0	
Surr: 4-Bromofluorobenzene	100		100.0		101	70	130	0	0	
Surr: Dibromofluoromethane	94		100.0		93.8	70	130	0	0	
Surr: Toluene-d8	100		100.0		104	70	130	0	0	

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A34023**	RunNo: **34023**
Prep Date:	Analysis Date: **5/5/2016**	SeqNo: **1048388** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	105	70	130			
Toluene	20	1.0	20.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	10		10.00		101	70	130			
Surr: Toluene-d8	9.6		10.00		95.9	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A34023**	RunNo: **34023**
Prep Date:	Analysis Date: **5/5/2016**	SeqNo: **1048389** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.4		10.00		94.3	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.1	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604C71**

20-May-16

Client: Western Refining Southwest, Inc.

Project: River Terrace Low Flow 4/28/16

Sample ID	**MB-25107**	SampType: **MBLK**			TestCode: **EPA 6010B: Total Recoverable Metals**					
Client ID:	**PBW**	Batch ID: **25107**			RunNo: **33941**					
Prep Date:	**5/2/2016**	Analysis Date: **5/3/2016**			SeqNo: **1045836**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	ND	0.0050								

Sample ID	**LCS-25107**	SampType: **LCS**			TestCode: **EPA 6010B: Total Recoverable Metals**					
Client ID:	**LCSW**	Batch ID: **25107**			RunNo: **33941**					
Prep Date:	**5/2/2016**	Analysis Date: **5/3/2016**			SeqNo: **1045840**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.52	0.0050	0.5000	0	104	80	120			

Sample ID	**1604C71-001DMS**	SampType: **MS**			TestCode: **EPA 6010B: Total Recoverable Metals**					
Client ID:	**TP-5**	Batch ID: **25107**			RunNo: **33941**					
Prep Date:	**5/2/2016**	Analysis Date: **5/3/2016**			SeqNo: **1046263**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.51	0.0050	0.5000	0.02745	97.2	75	125			

Sample ID	**1604C71-001DMSD**	SampType: **MSD**			TestCode: **EPA 6010B: Total Recoverable Metals**					
Client ID:	**TP-5**	Batch ID: **25107**			RunNo: **33941**					
Prep Date:	**5/2/2016**	Analysis Date: **5/3/2016**			SeqNo: **1046264**		Units: **mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Lead	0.53	0.0050	0.5000	0.02745	101	75	125	3.31	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw   Work Order Number: 1604C71   RcptNo: 1

Received by/date: CM 04/29/16

Logged By: Anne Thorne   4/29/2016 7:00:00 AM   Anne Thorne

Completed By: Anne Thorne   4/29/2016   Anne Thorne

Reviewed By: [signature] 04/29/16

Chain of Custody

1. Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☑
2. Is Chain of Custody complete? Yes ☑ No ☐ Not Present ☐
3. How was the sample delivered? Courier

Log In

4. Was an attempt made to cool the samples? Yes ☑ No ☐ NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C Yes ☑ No ☐ NA ☐
6. Sample(s) in proper container(s)? Yes ☑ No ☐
7. Sufficient sample volume for indicated test(s)? Yes ☑ No ☐
8. Are samples (except VOA and ONG) properly preserved? ~~Yes~~ ~~☑~~ No ☑
9. Was preservative added to bottles? Yes ☑ ~~No~~ ~~☑~~ NA ☐

FOR METALS ANALYSIS: ADDED 1mL HNO3 TO -001D-002D FOR ACCEPTABLE pH. HELD FOR 24 HOURS PRIOR TO ANALYSIS [initials] 04/29/16 @1220

10. VOA vials have zero headspace? Yes ☐ No ☐ No VOA Vials ☑
11. Were any sample containers received broken? Yes ☐ No ☑
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody) Yes ☑ No ☐
13. Are matrices correctly identified on Chain of Custody? Yes ☑ No ☐
14. Is it clear what analyses were requested? Yes ☑ No ☐
15. Were all holding times able to be met? (If no, notify customer for authorization.) Yes ☑ No ☐

# of preserved bottles checked for pH: 6
(<2 or >12 unless noted)
Adjusted? YES
Checked by: [signature]

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☑ NA ☐

Person Notified:		Date	
By Whom:		Via:	☐ eMail ☐ Phone ☐ Fax ☐ In Person
Regarding:			
Client Instructions:			

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other

X EDD (Type)

Turn-Around Time:

X Standard ☐ Rush

Project Name: River Terrace- Low Flow

4/28/16

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: X Yes ☐ No

Sample Temperature: 3.0 +1.0 = 04/29/16

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No 1604C71	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE Only	8270 (Semi-VOA)	DRO - Ext. 8015B	Total Metal Pb only			Air Bubbles (Y or N)
4/28/16	0950	H_2O	TP-5	5-VOA	HCL	-001			X							X						
				1-8oz Amber	Cool	AT 04/29/16 -002												X				
				1-500 ml	HNO_3	-003													X			

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
4-28-16	1554		Christine Walls	4/28/16	1554	
4/28/16	1810	Christine Walls		04/29/16	0700	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard **X** Level 4 (Full Validation)

☐ Other

X EDD (Type)

Turn-Around Time:

X Standard ☐ **Rush**

Project Name: River Terrace- Low Flow

4/28/16

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: **X** Yes ☐ No

Sample Temperature: 3.0 1.0 °T 4/29/16

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1604671	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE Only	8270 (Semi-VOA)	DRO - Ext. 8015B	Total Metal Pb only			Air Bubbles (Y or N)
4/28/16	1035	H_2O	DW-3	5-VOA	HCL	-002			X							X						
				1-8oz Amber	Cool	-002												X				
				1-500 ml	HNO_3	-002													X			

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
4-28-16	1554			4/28/16	1554	
4/28/16	1810			04/29/16	0700	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush _____

Project Name: River Terrace- Low Flow

4/28/16

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: X Yes ☐ No

Sample Temperature: 3.0 1.0 A 04/29/16

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1604C71	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO3,NO2,PO4,SO4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE Only	8270 (Semi-VOA)	DRO - Ext. 8015B	Total Metal Pb only			Air Bubbles (Y or N)
4/28/16	1125	H_2O	MW-49	5-VOA	HCL	-003			X							X						
				1-8oz Amber	Cool	-003												X				
				1-500 ml	HNO_3	-003													X			

Date:	Time:	Relinquished by:	Received by:	Date	Time
4-28-16	1554			4/28/16	1554
4/28/16	1810			04/29/16	0700

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Client: **Western Refining**

Mailing Address: **50 CR 4990**
Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:
☐ Standard X Level 4 (Full Validation)
☐ Other ______
X EDD (Type) ______

Turn-Around Time:
X Standard ☐ Rush ______

Project Name: River Terrace- Low Flow
4/28/16

Project #:
PO#12615519

Project Manager:
Kelly Robinson

Sampler: Michael A Wicker

On Ice: X Yes ☐ No

Sample Temperature: [illegible] 04/29/16

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1604C71	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE Only	8270 (Semi-VOA)	DRO - Ext. 8015B	Total Metal Pb only				Air Bubbles (Y or N)
4/28/16	1200	H_2O	TP-6	5-VOA	HCL	-004			X							X							
				1-8oz Amber	Cool	-004												X					
				1-500 ml	HNO_3	-004													X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
4-28-16	1554	[signature]	Christine Walters	4/28/16	1554
4/28/16	1810	Christine Walters	[signature]	04/29/16	0700

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other

X EDD (Type)

Turn-Around Time:

X Standard ☐ Rush

Project Name: River Terrace- Low Flow

4/28/16

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: X Yes ☐ No

Sample Temperature: 3.0/1.0 04/29/16

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1604C71	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE Only	8270 (Semi-VOA)	DRO - Ext. 8015B	Total Metal Pb only				Air Bubbles (Y or N)
4/28/16	1335	H_2O	TP-8	5-VOA	HCL	-005			X							X							
				1-8oz Amber	Cool	-005												X					
				1-500 ml	HNO_3	-005													X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
4-28-16	1554	[signature]	[signature]	4/28/16	1554
4/28/16	1810	[signature]	[signature]	04/29/16	0700

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other

X EDD (Type)

Turn-Around Time:

X Standard ☐ Rush

Project Name: **River Terrace- Low Flow 4/28/16**

Project #: **PO#12615519**

Project Manager: **Kelly Robinson**

Sampler: **Michael A Wicker**

On Ice: X Yes ☐ No

Sample Temperature: 3.6/1.0 m 04/29/16

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1604C71
4/28/16	1430	H_2O	TP-9	5-VOA	HCL	006
				1-8oz Amber	Cool	006
				1-500 ml	HNO_3	006

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE Only	8270 (Semi-VOA)	DRO - Ext. 8015B	Total Metal Pb only			Air Bubbles (Y or N)
		X							X						
											X				
												X			

Date:	Time:	Relinquished by:	Received by:	Date	Time	Remarks:
4-28-16	1554		Christine Walters	4/28/16	1554	
4/28/16	1810	Christine Walters		04/29/16	0700	

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 03, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4166
FAX (505) 632-3911

RE: GAC-1/13/16 OrderNo.: 1601453

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 1/14/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued February 04, 2016.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1601453**
Date Reported: **3/3/2016**

CLIENT: Western Refining Southwest, Inc.
Project: GAC-1/13/16
Lab ID: 1601453-001 **Matrix:** AQUEOUS

Client Sample ID: GAC-Inlet
Collection Date: 1/13/2016 11:00:00 AM
Received Date: 1/14/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	0.79	0.20		mg/L	1	1/18/2016 11:42:13 AM	23253
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/18/2016 11:42:13 AM	23253
Surr: DNOP	111	63.2-161		%Rec	1	1/18/2016 11:42:13 AM	23253
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1.1	0.25		mg/L	5	1/19/2016 2:30:39 PM	R31540
Surr: BFB	123	49.5-130		%Rec	5	1/19/2016 2:30:39 PM	R31540
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	5.0		µg/L	5	1/19/2016 8:07:11 PM	R31533
Toluene	ND	5.0		µg/L	5	1/19/2016 8:07:11 PM	R31533
Ethylbenzene	22	5.0		µg/L	5	1/19/2016 8:07:11 PM	R31533
Methyl tert-butyl ether (MTBE)	ND	5.0		µg/L	5	1/19/2016 8:07:11 PM	R31533
Xylenes, Total	42	7.5		µg/L	5	1/19/2016 8:07:11 PM	R31533
Surr: 1,2-Dichloroethane-d4	98.9	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533
Surr: 4-Bromofluorobenzene	81.2	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533
Surr: Dibromofluoromethane	105	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533
Surr: Toluene-d8	98.1	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC-1/13/16
Collection Date: 1/13/2016 11:20:00 AM
Lab ID: 1601453-002
Matrix: AQUEOUS
Received Date: 1/14/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/18/2016 12:47:03 PM	23253
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/18/2016 12:47:03 PM	23253
Surr: DNOP	105	63.2-161		%Rec	1	1/18/2016 12:47:03 PM	23253
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/19/2016 2:53:26 PM	R31540
Surr: BFB	87.4	49.5-130		%Rec	1	1/19/2016 2:53:26 PM	R31540
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/19/2016 8:36:01 PM	R31533
Toluene	ND	1.0		µg/L	1	1/19/2016 8:36:01 PM	R31533
Ethylbenzene	ND	1.0		µg/L	1	1/19/2016 8:36:01 PM	R31533
Methyl tert-butyl ether (MTBE)	2.8	1.0		µg/L	1	1/19/2016 8:36:01 PM	R31533
Xylenes, Total	ND	1.5		µg/L	1	1/19/2016 8:36:01 PM	R31533
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533
Surr: 4-Bromofluorobenzene	98.8	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533
Surr: Dibromofluoromethane	108	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533
Surr: Toluene-d8	95.9	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lag
Project: GAC-1/13/16
Collection Date: 1/13/2016 11:40:00 AM
Lab ID: 1601453-003
Matrix: AQUEOUS
Received Date: 1/14/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/18/2016 1:08:21 PM	23253
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/18/2016 1:08:21 PM	23253
Surr: DNOP	111	63.2-161		%Rec	1	1/18/2016 1:08:21 PM	23253
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/19/2016 3:16:14 PM	R31540
Surr: BFB	84.9	49.5-130		%Rec	1	1/19/2016 3:16:14 PM	R31540
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/19/2016 9:04:45 PM	R31533
Toluene	ND	1.0		µg/L	1	1/19/2016 9:04:45 PM	R31533
Ethylbenzene	ND	1.0		µg/L	1	1/19/2016 9:04:45 PM	R31533
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	1/19/2016 9:04:45 PM	R31533
Xylenes, Total	ND	1.5		µg/L	1	1/19/2016 9:04:45 PM	R31533
Surr: 1,2-Dichloroethane-d4	98.1	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533
Surr: Dibromofluoromethane	106	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533
Surr: Toluene-d8	93.8	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**

03-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC-1/13/16

Sample ID **MB-23253**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **963872** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.53		0.5000		106	63.2	161			

Sample ID **LCS-23253**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **963934** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.3	0.20	2.500	0	91.5	65.4	162			
Surr: DNOP	0.23		0.2500		93.5	63.2	161			

Sample ID **1601453-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Inlet**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **963968** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0.7934	91.0	73.3	174			
Surr: DNOP	0.24		0.2500		95.9	63.2	161			

Sample ID **1601453-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Inlet**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **964050** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0.7934	95.9	73.3	174	3.90	20	
Surr: DNOP	0.25		0.2500		101	63.2	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**

03-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC-1/13/16

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**PBW**	Batch ID:	**R31540**	RunNo:	**31540**					
Prep Date:		Analysis Date:	**1/19/2016**	SeqNo:	**965293**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		90.6	49.5	130			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSW**	Batch ID:	**R31540**	RunNo:	**31540**					
Prep Date:		Analysis Date:	**1/19/2016**	SeqNo:	**965294**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	94.8	80	120			
Surr: BFB	21		20.00		103	49.5	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**

03-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC-1/13/16

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A31485**	RunNo: **31485**
Prep Date:	Analysis Date: **1/15/2016**	SeqNo: **963779** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.4	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.5	70	130			
Surr: Toluene-d8	9.8		10.00		98.2	70	130			

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A31485**	RunNo: **31485**
Prep Date:	Analysis Date: **1/15/2016**	SeqNo: **963780** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.6	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.8	70	130			
Surr: Dibromofluoromethane	8.7		10.00		86.9	70	130			
Surr: Toluene-d8	9.8		10.00		97.9	70	130			

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A31514**	RunNo: **31514**
Prep Date:	Analysis Date: **1/18/2016**	SeqNo: **964373** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.6		10.00		95.9	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.5	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	9.4		10.00		93.5	70	130			

Sample ID **rb3**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A31514**	RunNo: **31514**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **964374** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.6	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.5	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.4		10.00		94.1	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R31533**	RunNo: **31533**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965174** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**

03-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC-1/13/16

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R31533**	RunNo: **31533**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965174** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	110	70	130			
Toluene	22	1.0	20.00	0	111	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.1	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	9.8		10.00		98.2	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R31533**	RunNo: **31533**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965175** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		96.5	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.4	70	130			
Surr: Toluene-d8	9.4		10.00		94.2	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1601453 RcptNo: 1

Received by/date: 01/14/16

Logged By: Lindsay Mangin 1/14/2016 8:00:00 AM

Completed By: Lindsay Mangin 1/14/2016 10:22:26 AM

Reviewed By: 01/14/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Yes			

Chain-of-Custody Record

Client: Western Refining

Mailing Address: #50 CR4990

Phone #: 505-632-4169

email or Fax#:

QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: GAC - 1/13/16

Project #: PO - 12610954

Project Manager:

Sampler: Matt

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1601453	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015B DRO Ext.				Air Bubbles (Y or N)
1/16	11:00	H_2O	GAC-Inlet	4-VOA	HCL	-001			X							X						
1/16	11:00	H_2O	GAC-Inlet	1-liter	Amber	-001												X				
1/16	11:20	H_2O	GAC-lead	4-VOA	HCL	-002			X							X						
1/16	11:20	H_2O	GAC-lead	1-liter	Amber	-002												X				
1/16	11:40	H_2O	GAC-lag	4-VOA	HCL	-003			X							X						
1/16	11:40	H_2O	GAC-lag	1-liter	Amber	-003												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
1/16	3:00			1/13/16	1516
1/13/16	1520			01/14/16	0800

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 04, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4166
FAX (505) 632-3911

RE: GAC-1/13/16 OrderNo.: 1601453

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 1/14/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1601453**
Date Reported: **2/4/2016**

CLIENT: Western Refining Southwest, Inc.
Project: GAC-1/13/16
Lab ID: 1601453-001 **Matrix:** AQUEOUS

Client Sample ID: GAC-Inlet
Collection Date: 1/13/2016 11:00:00 AM
Received Date: 1/14/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	0.79	0.20		mg/L	1	1/18/2016 11:42:13 AM	23253
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/18/2016 11:42:13 AM	23253
Surr: DNOP	111	63.2-161		%Rec	1	1/18/2016 11:42:13 AM	23253
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1.1	0.25		mg/L	5	1/19/2016 2:30:39 PM	R31540
Surr: BFB	123	49.5-130		%Rec	5	1/19/2016 2:30:39 PM	R31540
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	2.5		µg/L	5	1/19/2016 8:07:11 PM	R31533
Toluene	ND	5.0		µg/L	5	1/19/2016 8:07:11 PM	R31533
Ethylbenzene	22	5.0		µg/L	5	1/19/2016 8:07:11 PM	R31533
Xylenes, Total	42	7.5		µg/L	5	1/19/2016 8:07:11 PM	R31533
Surr: 1,2-Dichloroethane-d4	98.9	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533
Surr: 4-Bromofluorobenzene	81.2	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533
Surr: Dibromofluoromethane	105	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533
Surr: Toluene-d8	98.1	70-130		%Rec	5	1/19/2016 8:07:11 PM	R31533

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC-1/13/16
Collection Date: 1/13/2016 11:20:00 AM
Lab ID: 1601453-002
Matrix: AQUEOUS
Received Date: 1/14/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/18/2016 12:47:03 PM	23253
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/18/2016 12:47:03 PM	23253
Surr: DNOP	105	63.2-161		%Rec	1	1/18/2016 12:47:03 PM	23253
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/19/2016 2:53:26 PM	R31540
Surr: BFB	87.4	49.5-130		%Rec	1	1/19/2016 2:53:26 PM	R31540
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/19/2016 8:36:01 PM	R31533
Toluene	ND	1.0		µg/L	1	1/19/2016 8:36:01 PM	R31533
Ethylbenzene	ND	1.0		µg/L	1	1/19/2016 8:36:01 PM	R31533
Xylenes, Total	ND	1.5		µg/L	1	1/19/2016 8:36:01 PM	R31533
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533
Surr: 4-Bromofluorobenzene	98.8	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533
Surr: Dibromofluoromethane	108	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533
Surr: Toluene-d8	95.9	70-130		%Rec	1	1/19/2016 8:36:01 PM	R31533

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lag
Project: GAC-1/13/16
Collection Date: 1/13/2016 11:40:00 AM
Lab ID: 1601453-003
Matrix: AQUEOUS
Received Date: 1/14/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	1/18/2016 1:08:21 PM	23253
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	1/18/2016 1:08:21 PM	23253
Surr: DNOP	111	63.2-161		%Rec	1	1/18/2016 1:08:21 PM	23253
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	1/19/2016 3:16:14 PM	R31540
Surr: BFB	84.9	49.5-130		%Rec	1	1/19/2016 3:16:14 PM	R31540
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	1/19/2016 9:04:45 PM	R31533
Toluene	ND	1.0		µg/L	1	1/19/2016 9:04:45 PM	R31533
Ethylbenzene	ND	1.0		µg/L	1	1/19/2016 9:04:45 PM	R31533
Xylenes, Total	ND	1.5		µg/L	1	1/19/2016 9:04:45 PM	R31533
Surr: 1,2-Dichloroethane-d4	98.1	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533
Surr: 4-Bromofluorobenzene	101	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533
Surr: Dibromofluoromethane	106	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533
Surr: Toluene-d8	93.8	70-130		%Rec	1	1/19/2016 9:04:45 PM	R31533

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**

04-Feb-16

Client: Western Refining Southwest, Inc.

Project: GAC-1/13/16

Sample ID **MB-23253**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **963872** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.53		0.5000		106	63.2	161			

Sample ID **LCS-23253**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **963934** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.3	0.20	2.500	0	91.5	65.4	162			
Surr: DNOP	0.23		0.2500		93.5	63.2	161			

Sample ID **1601453-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Inlet**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **963968** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0.7934	91.0	73.3	174			
Surr: DNOP	0.24		0.2500		95.9	63.2	161			

Sample ID **1601453-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Inlet**	Batch ID: **23253**	RunNo: **31488**
Prep Date: **1/18/2016**	Analysis Date: **1/18/2016**	SeqNo: **964050** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0.7934	95.9	73.3	174	3.90	20	
Surr: DNOP	0.25		0.2500		101	63.2	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**
04-Feb-16

Client: Western Refining Southwest, Inc.
Project: GAC-1/13/16

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **R31540**	RunNo: **31540**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965293** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		90.6	49.5	130			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **R31540**	RunNo: **31540**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965294** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	94.8	80	120			
Surr: BFB	21		20.00		103	49.5	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**

04-Feb-16

Client: Western Refining Southwest, Inc.
Project: GAC-1/13/16

Sample ID **rb2**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A31485**	RunNo: **31485**
Prep Date:	Analysis Date: **1/15/2016**	SeqNo: **963779** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.4	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.5	70	130			
Surr: Toluene-d8	9.8		10.00		98.2	70	130			

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A31485**	RunNo: **31485**
Prep Date:	Analysis Date: **1/15/2016**	SeqNo: **963780** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.6	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.8	70	130			
Surr: Dibromofluoromethane	8.7		10.00		86.9	70	130			
Surr: Toluene-d8	9.8		10.00		97.9	70	130			

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A31514**	RunNo: **31514**
Prep Date:	Analysis Date: **1/18/2016**	SeqNo: **964373** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.6		10.00		95.9	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		96.5	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	9.4		10.00		93.5	70	130			

Sample ID **rb3**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A31514**	RunNo: **31514**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **964374** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.6	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.5	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.4		10.00		94.1	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R31533**	RunNo: **31533**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965174** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1601453**

04-Feb-16

Client: Western Refining Southwest, Inc.

Project: GAC-1/13/16

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R31533**	RunNo: **31533**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965174** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	22	1.0	20.00	0	110	70	130			
Toluene	22	1.0	20.00	0	111	70	130			
Surr: 1,2-Dichloroethane-d4	9.9		10.00		99.1	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	9.8		10.00		98.2	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R31533**	RunNo: **31533**
Prep Date:	Analysis Date: **1/19/2016**	SeqNo: **965175** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.7		10.00		96.5	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.4	70	130			
Surr: Toluene-d8	9.4		10.00		94.2	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1601453 RcptNo: 1

Received by/date: 01/14/16

Logged By: Lindsay Mangin 1/14/2016 8:00:00 AM

Completed By: Lindsay Mangin 1/14/2016 10:22:26 AM

Reviewed By: 01/14/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Yes			

Chain-of-Custody Record

Client: Western Refining

Mailing Address: #50 CR4990

Phone #: 505-632-4169

email or Fax#:

QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other

☐ EDD (Type)

Turn-Around Time:
☒ Standard ☐ Rush

Project Name: GAC - 1/13/16

Project #: PO - 12610954

Project Manager:

Sampler: Matt

On Ice: ☒ Yes ☐ No

Sample Temperature: 1.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1601453	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015B DRO Ext.				Air Bubbles (Y or N)
1/16	11:00	H_2O	GAC-Inlet	4-VOA	HCL	-001			X							X						
1/16	11:00	H_2O	GAC-Inlet	1-liter	Amber	-001												X				
1/16	11:20	H_2O	GAC-lead	4-VOA	HCL	-002			X							X						
1/16	11:20	H_2O	GAC-lead	1-liter	Amber	-002												X				
1/16	11:40	H_2O	GAC-lag	4-VOA	HCL	-003			X							X						
1/16	11:40	H_2O	GAC-lag	1-liter	Amber	-003												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
1/16	3:00			1/13/16	1516
1/13/16	1520			01/14/16	0800

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 09, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC 2-24-16 OrderNo.: 1602B06

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 2/26/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lag
Project: GAC 2-24-16
Collection Date: 2/24/2016 2:35:00 PM
Lab ID: 1602B06-001
Matrix: AQUEOUS
Received Date: 2/26/2016 8:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **KJH**	
Diesel Range Organics (DRO)	ND	0.20	0.20		mg/L	1	2/29/2016 2:52:14 PM	23973
Motor Oil Range Organics (MRO)	ND	2.5	2.5		mg/L	1	2/29/2016 2:52:14 PM	23973
Surr: DNOP	124	0	63.2-161		%Rec	1	2/29/2016 2:52:14 PM	23973
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	3/1/2016 3:20:00 PM	A32486
Surr: BFB	77.6	0	49.5-130		%Rec	1	3/1/2016 3:20:00 PM	A32486
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **DJF**	
Benzene	ND	0.48	5.0	D	µg/L	5	2/29/2016 1:09:24 PM	A32476
Toluene	ND	0.45	5.0	D	µg/L	5	2/29/2016 1:09:24 PM	A32476
Ethylbenzene	ND	0.56	5.0	D	µg/L	5	2/29/2016 1:09:24 PM	A32476
Methyl tert-butyl ether (MTBE)	ND	1.1	5.0	D	µg/L	5	2/29/2016 1:09:24 PM	A32476
Xylenes, Total	ND	1.6	7.5	D	µg/L	5	2/29/2016 1:09:24 PM	A32476
Surr: 1,2-Dichloroethane-d4	96.0	0	70-130	D	%Rec	5	2/29/2016 1:09:24 PM	A32476
Surr: 4-Bromofluorobenzene	109	0	70-130	D	%Rec	5	2/29/2016 1:09:24 PM	A32476
Surr: Dibromofluoromethane	101	0	70-130	D	%Rec	5	2/29/2016 1:09:24 PM	A32476
Surr: Toluene-d8	103	0	70-130	D	%Rec	5	2/29/2016 1:09:24 PM	A32476

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC 2-24-16
Collection Date: 2/24/2016 2:25:00 PM
Lab ID: 1602B06-002
Matrix: AQUEOUS
Received Date: 2/26/2016 8:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **KJH**	
Diesel Range Organics (DRO)	ND	0.20	0.20		mg/L	1	2/29/2016 3:57:44 PM	23973
Motor Oil Range Organics (MRO)	ND	2.5	2.5		mg/L	1	2/29/2016 3:57:44 PM	23973
Surr: DNOP	123	0	63.2-161		%Rec	1	2/29/2016 3:57:44 PM	23973
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.025	0.050		mg/L	1	2/29/2016 5:22:38 PM	R32473
Surr: BFB	85.8	0	49.5-130		%Rec	1	2/29/2016 5:22:38 PM	R32473
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **DJF**	
Benzene	ND	0.096	1.0		µg/L	1	2/29/2016 2:34:40 PM	A32476
Toluene	ND	0.089	1.0		µg/L	1	2/29/2016 2:34:40 PM	A32476
Ethylbenzene	ND	0.11	1.0		µg/L	1	2/29/2016 2:34:40 PM	A32476
Methyl tert-butyl ether (MTBE)	2.1	0.21	1.0		µg/L	1	2/29/2016 2:34:40 PM	A32476
Xylenes, Total	ND	0.32	1.5		µg/L	1	2/29/2016 2:34:40 PM	A32476
Surr: 1,2-Dichloroethane-d4	97.2	0	70-130		%Rec	1	2/29/2016 2:34:40 PM	A32476
Surr: 4-Bromofluorobenzene	106	0	70-130		%Rec	1	2/29/2016 2:34:40 PM	A32476
Surr: Dibromofluoromethane	103	0	70-130		%Rec	1	2/29/2016 2:34:40 PM	A32476
Surr: Toluene-d8	107	0	70-130		%Rec	1	2/29/2016 2:34:40 PM	A32476

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC 2-24-16
Collection Date: 2/24/2016 2:17:00 PM
Lab ID: 1602B06-003
Matrix: AQUEOUS
Received Date: 2/26/2016 8:00:00 AM

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed	Batch ID
EPA METHOD 8015D: DIESEL RANGE							Analyst: **KJH**	
Diesel Range Organics (DRO)	4.5	0.20	0.20		mg/L	1	2/29/2016 4:19:36 PM	23973
Motor Oil Range Organics (MRO)	ND	2.5	2.5		mg/L	1	2/29/2016 4:19:36 PM	23973
Surr: DNOP	117	0	63.2-161		%Rec	1	2/29/2016 4:19:36 PM	23973
EPA METHOD 8015D: GASOLINE RANGE							Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.60	0.025	0.050		mg/L	1	2/29/2016 5:46:59 PM	R32473
Surr: BFB	208	0	49.5-130	S	%Rec	1	2/29/2016 5:46:59 PM	R32473
EPA METHOD 8260: VOLATILES SHORT LIST							Analyst: **DJF**	
Benzene	0.75	0.096	1.0	J	µg/L	1	2/29/2016 3:03:00 PM	A32476
Toluene	0.29	0.089	1.0	J	µg/L	1	2/29/2016 3:03:00 PM	A32476
Ethylbenzene	17	0.11	1.0		µg/L	1	2/29/2016 3:03:00 PM	A32476
Methyl tert-butyl ether (MTBE)	ND	0.21	1.0		µg/L	1	2/29/2016 3:03:00 PM	A32476
Xylenes, Total	3.8	0.32	1.5		µg/L	1	2/29/2016 3:03:00 PM	A32476
Surr: 1,2-Dichloroethane-d4	93.3	0	70-130		%Rec	1	2/29/2016 3:03:00 PM	A32476
Surr: 4-Bromofluorobenzene	97.5	0	70-130		%Rec	1	2/29/2016 3:03:00 PM	A32476
Surr: Dibromofluoromethane	98.0	0	70-130		%Rec	1	2/29/2016 3:03:00 PM	A32476
Surr: Toluene-d8	105	0	70-130		%Rec	1	2/29/2016 3:03:00 PM	A32476

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1602B06**

09-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 2-24-16

Sample ID **LCS-23973**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **LCSW**	Batch ID: **23973**	RunNo: **32458**							
Prep Date: **2/29/2016**	Analysis Date: **2/29/2016**	SeqNo: **993032**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	126	65.4	162			
Surr: DNOP	0.29		0.2500		116	63.2	161			

Sample ID **MB-23973**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **PBW**	Batch ID: **23973**	RunNo: **32458**							
Prep Date: **2/29/2016**	Analysis Date: **2/29/2016**	SeqNo: **993033**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.60		0.5000		121	63.2	161			

Sample ID **1602B06-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **GAC-Lag**	Batch ID: **23973**	RunNo: **32458**							
Prep Date: **2/29/2016**	Analysis Date: **2/29/2016**	SeqNo: **993100**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.0	0.20	2.500	0	120	73.3	174			
Surr: DNOP	0.27		0.2500		110	63.2	161			

Sample ID **1602B06-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **GAC-Lag**	Batch ID: **23973**	RunNo: **32458**							
Prep Date: **2/29/2016**	Analysis Date: **2/29/2016**	SeqNo: **993101**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0	130	73.3	174	7.63	20	
Surr: DNOP	0.29		0.2500		117	63.2	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1602B06**

09-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 2-24-16

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **R32473**	RunNo: **32473**
Prep Date:	Analysis Date: **2/29/2016**	SeqNo: **993128** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		88.7	49.5	130			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **R32473**	RunNo: **32473**
Prep Date:	Analysis Date: **2/29/2016**	SeqNo: **993129** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.45	0.050	0.5000	0	90.8	80	120			
Surr: BFB	21		20.00		104	49.5	130			

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **A32486**	RunNo: **32486**
Prep Date:	Analysis Date: **3/1/2016**	SeqNo: **993897** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		87.8	49.5	130			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **A32486**	RunNo: **32486**
Prep Date:	Analysis Date: **3/1/2016**	SeqNo: **993898** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	94.8	80	120			
Surr: BFB	21		20.00		107	49.5	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1602B06**

09-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 2-24-16

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A32476**	RunNo: **32476**
Prep Date:	Analysis Date: **2/29/2016**	SeqNo: **993243** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		99.6	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		109	70	130			
Surr: Dibromofluoromethane	10		10.00		100	70	130			
Surr: Toluene-d8	11		10.00		105	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A32476**	RunNo: **32476**
Prep Date:	Analysis Date: **2/29/2016**	SeqNo: **993244** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	103	70	130			
Toluene	23	1.0	20.00	0	113	70	130			
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.5	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		106	70	130			
Surr: Dibromofluoromethane	9.6		10.00		95.8	70	130			
Surr: Toluene-d8	11		10.00		106	70	130			

Sample ID **1602b06-001a ms**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lag**	Batch ID: **A32476**	RunNo: **32476**
Prep Date:	Analysis Date: **2/29/2016**	SeqNo: **993246** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	110	5.0	100.0	0	110	70	130			D
Toluene	110	5.0	100.0	0	113	70	130			D
Surr: 1,2-Dichloroethane-d4	52		50.00		104	70	130			D
Surr: 4-Bromofluorobenzene	56		50.00		111	70	130			D
Surr: Dibromofluoromethane	52		50.00		103	70	130			D
Surr: Toluene-d8	52		50.00		103	70	130			D

Sample ID **1602b06-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lag**	Batch ID: **A32476**	RunNo: **32476**
Prep Date:	Analysis Date: **2/29/2016**	SeqNo: **993247** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	100	5.0	100.0	0	104	70	130	6.40	20	D

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1602B06**

09-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 2-24-16

Sample ID **1602b06-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lag**	Batch ID: **A32476**	RunNo: **32476**
Prep Date:	Analysis Date: **2/29/2016**	SeqNo: **993247** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	100	5.0	100.0	0	104	70	130	7.68	20	D
Surr: 1,2-Dichloroethane-d4	50		50.00		100	70	130	0	0	D
Surr: 4-Bromofluorobenzene	54		50.00		108	70	130	0	0	D
Surr: Dibromofluoromethane	51		50.00		103	70	130	0	0	D
Surr: Toluene-d8	51		50.00		101	70	130	0	0	D

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1602B06 RcptNo: 1

Received by/date: 02/26/16

Logged By: Ashley Gallegos 2/26/2016 8:00:00 AM

Completed By: Ashley Gallegos 2/26/2016 10:15:06 AM

Reviewed By: 02/26/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.0	Good	Yes			

Chain-of-Custody Record

Client: Western Refining

Mailing Address: #50 CR4990
Bloomfield NM 87413

Phone #: 505-632-4169

Email or Fax#:

QA/QC Package:
☐ Standard ☒ Level 4 (Full Validation)

Accreditation
☐ NELAP ☐ Other _____

☐ EDD (Type) _____

Turn-Around Time:
☒ Standard ☐ Rush _____

Project Name:
GAC - 2-24-16

Project #:
PO# 126155 19

Project Manager:

Sampler: Matt
On Ice: ☒ Yes ☐ No
Sample Temperature: 1.0

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1102B016	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH's (8310 or 8270 SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015B DRO Ext.				Air Bubbles (Y or N)
2-24-16	1435	H_2O	GAC-Lag	4 VOAs	HCL	-001			X							X						
				1-500mL	Amber													X				
	1425		GAC-Lead	4 VOAs	HCL	-002			X							X						
				1-500mL	Amber													X				
	1417		GAC-Inlet	4 VOAs	HCL	-003			X							X						
↓				1-500mL	Amber													X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
2-25-16	3:00				
Date:	Time:	Relinquished by:	Received by:	Date	Time
2/25/16	1820			02/26/16	0800

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

March 16, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC 3-8-16 OrderNo.: 1603449

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 3/9/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1603449**
Date Reported: **3/16/2016**

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Lag
Project: GAC 3-8-16
Collection Date: 3/8/2016 3:10:00 PM
Lab ID: 1603449-001 **Matrix:** AQUEOUS **Received Date:** 3/9/2016 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	3/9/2016 2:02:42 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	3/9/2016 2:02:42 PM
Surr: DNOP	90.7	63.2-161		%Rec	1	3/9/2016 2:02:42 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/10/2016 3:46:44 PM
Surr: BFB	88.0	49.5-130		%Rec	1	3/10/2016 3:46:44 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	3/11/2016 12:42:42 PM
Toluene	ND	1.0		µg/L	1	3/11/2016 12:42:42 PM
Ethylbenzene	ND	1.0		µg/L	1	3/11/2016 12:42:42 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	3/11/2016 12:42:42 PM
Xylenes, Total	ND	1.5		µg/L	1	3/11/2016 12:42:42 PM
Surr: 1,2-Dichloroethane-d4	95.3	70-130		%Rec	1	3/11/2016 12:42:42 PM
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	1	3/11/2016 12:42:42 PM
Surr: Dibromofluoromethane	93.7	70-130		%Rec	1	3/11/2016 12:42:42 PM
Surr: Toluene-d8	97.9	70-130		%Rec	1	3/11/2016 12:42:42 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Lead
Project: GAC 3-8-16 **Collection Date:** 3/8/2016 3:15:00 PM
Lab ID: 1603449-002 **Matrix:** AQUEOUS **Received Date:** 3/9/2016 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	3/9/2016 3:07:11 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	3/9/2016 3:07:11 PM
Surr: DNOP	87.0	63.2-161		%Rec	1	3/9/2016 3:07:11 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	3/10/2016 5:00:35 PM
Surr: BFB	83.4	49.5-130		%Rec	1	3/10/2016 5:00:35 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	3/11/2016 1:10:58 PM
Toluene	ND	1.0		µg/L	1	3/11/2016 1:10:58 PM
Ethylbenzene	ND	1.0		µg/L	1	3/11/2016 1:10:58 PM
Methyl tert-butyl ether (MTBE)	1.7	1.0		µg/L	1	3/11/2016 1:10:58 PM
Xylenes, Total	ND	1.5		µg/L	1	3/11/2016 1:10:58 PM
Surr: 1,2-Dichloroethane-d4	98.5	70-130		%Rec	1	3/11/2016 1:10:58 PM
Surr: 4-Bromofluorobenzene	110	70-130		%Rec	1	3/11/2016 1:10:58 PM
Surr: Dibromofluoromethane	98.4	70-130		%Rec	1	3/11/2016 1:10:58 PM
Surr: Toluene-d8	103	70-130		%Rec	1	3/11/2016 1:10:58 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Inlet
Project: GAC 3-8-16
Collection Date: 3/8/2016 3:20:00 PM
Lab ID: 1603449-003
Matrix: AQUEOUS
Received Date: 3/9/2016 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	0.92	0.20		mg/L	1	3/9/2016 3:28:44 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	3/9/2016 3:28:44 PM
Surr: DNOP	92.3	63.2-161		%Rec	1	3/9/2016 3:28:44 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.92	0.050		mg/L	1	3/10/2016 5:25:07 PM
Surr: BFB	228	49.5-130	S	%Rec	1	3/10/2016 5:25:07 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	3/11/2016 1:39:23 PM
Toluene	ND	1.0		µg/L	1	3/11/2016 1:39:23 PM
Ethylbenzene	12	1.0		µg/L	1	3/11/2016 1:39:23 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	3/11/2016 1:39:23 PM
Xylenes, Total	8.5	1.5		µg/L	1	3/11/2016 1:39:23 PM
Surr: 1,2-Dichloroethane-d4	91.0	70-130		%Rec	1	3/11/2016 1:39:23 PM
Surr: 4-Bromofluorobenzene	104	70-130		%Rec	1	3/11/2016 1:39:23 PM
Surr: Dibromofluoromethane	89.5	70-130		%Rec	1	3/11/2016 1:39:23 PM
Surr: Toluene-d8	101	70-130		%Rec	1	3/11/2016 1:39:23 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1603449**

16-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 3-8-16

Sample ID **MB-24165**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **24165**	RunNo: **32662**
Prep Date: **3/9/2016**	Analysis Date: **3/9/2016**	SeqNo: **999977** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.35		0.5000		69.7	63.2	161			

Sample ID **LCS-24165**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24165**	RunNo: **32662**
Prep Date: **3/9/2016**	Analysis Date: **3/9/2016**	SeqNo: **999978** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.3	0.20	2.500	0	92.0	65.4	162			
Surr: DNOP	0.23		0.2500		90.7	63.2	161			

Sample ID **1603449-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **Lag**	Batch ID: **24165**	RunNo: **32662**
Prep Date: **3/9/2016**	Analysis Date: **3/9/2016**	SeqNo: **1000168** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.4	0.20	2.500	0	96.3	73.3	174			
Surr: DNOP	0.24		0.2500		94.6	63.2	161			

Sample ID **1603449-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **Lag**	Batch ID: **24165**	RunNo: **32662**
Prep Date: **3/9/2016**	Analysis Date: **3/9/2016**	SeqNo: **1000169** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.4	0.20	2.500	0	94.8	73.3	174	1.57	20	
Surr: DNOP	0.24		0.2500		94.8	63.2	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1603449**

16-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 3-8-16

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **C32696**	RunNo: **32696**
Prep Date:	Analysis Date: **3/10/2016**	SeqNo: **1001375** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		89.0	49.5	130			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **C32696**	RunNo: **32696**
Prep Date:	Analysis Date: **3/10/2016**	SeqNo: **1001376** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.52	0.050	0.5000	0	104	80	120			
Surr: BFB	21		20.00		104	49.5	130			

Sample ID **1603449-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Lag**	Batch ID: **C32696**	RunNo: **32696**
Prep Date:	Analysis Date: **3/10/2016**	SeqNo: **1001379** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.52	0.050	0.5000	0	103	70	130			
Surr: BFB	20		20.00		102	49.5	130			

Sample ID **1603449-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Lag**	Batch ID: **C32696**	RunNo: **32696**
Prep Date:	Analysis Date: **3/10/2016**	SeqNo: **1001380** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	93.1	70	130	10.3	20	
Surr: BFB	20		20.00		99.0	49.5	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1603449**

16-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 3-8-16

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A32762**	RunNo: **32762**
Prep Date:	Analysis Date: **3/11/2016**	SeqNo: **1002963** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.1		10.00		90.8	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		114	70	130			
Surr: Dibromofluoromethane	9.3		10.00		92.6	70	130			
Surr: Toluene-d8	9.8		10.00		97.7	70	130			

Sample ID **100ng lcs b**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A32762**	RunNo: **32762**
Prep Date:	Analysis Date: **3/11/2016**	SeqNo: **1002964** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	90.5	70	130			
Toluene	20	1.0	20.00	0	98.8	70	130			
Surr: 1,2-Dichloroethane-d4	9.3		10.00		92.7	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		111	70	130			
Surr: Dibromofluoromethane	9.1		10.00		90.9	70	130			
Surr: Toluene-d8	9.8		10.00		98.3	70	130			

Sample ID **1603449-001a ms**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lag**	Batch ID: **A32762**	RunNo: **32762**
Prep Date:	Analysis Date: **3/11/2016**	SeqNo: **1002966** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.2	70	130			
Toluene	19	1.0	20.00	0	97.3	70	130			
Surr: 1,2-Dichloroethane-d4	9.4		10.00		94.1	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		110	70	130			
Surr: Dibromofluoromethane	9.5		10.00		94.7	70	130			
Surr: Toluene-d8	9.3		10.00		93.5	70	130			

Sample ID **1603449-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lag**	Batch ID: **A32762**	RunNo: **32762**
Prep Date:	Analysis Date: **3/11/2016**	SeqNo: **1002967** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	93.0	70	130	6.43	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1603449**

16-Mar-16

Client: Western Refining Southwest, Inc.

Project: GAC 3-8-16

Sample ID **1603449-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lag**	Batch ID: **A32762**	RunNo: **32762**
Prep Date:	Analysis Date: **3/11/2016**	SeqNo: **1002967** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	20	1.0	20.00	0	102	70	130	4.84	20	
Surr: 1,2-Dichloroethane-d4	9.4		10.00		94.1	70	130	0	0	
Surr: 4-Bromofluorobenzene	11		10.00		108	70	130	0	0	
Surr: Dibromofluoromethane	9.4		10.00		93.7	70	130	0	0	
Surr: Toluene-d8	9.7		10.00		97.4	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1603449 RcptNo: 1

Received by/date: 03/09/16

Logged By: **Lindsay Mangin** 3/9/2016 7:15:00 AM

Completed By: **Lindsay Mangin** 3/9/2016 8:24:18 AM

Reviewed By: 03/09/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.1	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

☐ Other _____

☒ EDD (Type) _____

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: **GAC**

3-8-16

Project #:

PO#12615519

Project Manager:

Sampler:

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1603449	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015 B DRO Extented				Air Bubbles (Y or N)
3-8-16	1510	H_2O	Lag	5 - VOA	HCl	-001			x							x						
	1510	H_2O	Lag	1	Amber	-001												x				
	1515	H_2O	Lead	5 - VOA	HCl	-002			x							x						
	1515	H_2O	Lead	1	Amber	-002												x				
	1520	H_2O	Inlet	5 - VOA	HCl	-003			x							x						
↓	1520	H_2O	Inlet	1	Amber	-003												x				

Date:	Time:	Relinquished by:	Received by:	Date	Time
3-16	1602			3/8/16	1602
8/16	1829			03/09/16	0715

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

April 26, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC-Lead 4-7-16 OrderNo.: 1604448

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 4/12/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1604448**
Date Reported: **4/26/2016**

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC-Lead 4-7-16
Collection Date: 4/7/2016 2:35:00 PM
Lab ID: 1604448-001 **Matrix:** AQUEOUS **Received Date:** 4/12/2016 8:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	4/14/2016 12:31:48 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	4/14/2016 12:31:48 PM
Surr: DNOP	130	63.2-161		%Rec	1	4/14/2016 12:31:48 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	4/12/2016 4:14:16 PM
Surr: BFB	92.6	66.4-120		%Rec	1	4/12/2016 4:14:16 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	4/18/2016 2:19:40 PM
Toluene	ND	1.0		µg/L	1	4/18/2016 2:19:40 PM
Ethylbenzene	ND	1.0		µg/L	1	4/18/2016 2:19:40 PM
Xylenes, Total	ND	1.5		µg/L	1	4/18/2016 2:19:40 PM
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	4/18/2016 2:19:40 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	4/18/2016 2:19:40 PM
Surr: Dibromofluoromethane	102	70-130		%Rec	1	4/18/2016 2:19:40 PM
Surr: Toluene-d8	99.6	70-130		%Rec	1	4/18/2016 2:19:40 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC-Lead 4-7-16
Collection Date: 4/7/2016 2:25:00 PM
Lab ID: 1604448-002 **Matrix:** AQUEOUS **Received Date:** 4/12/2016 8:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**
Diesel Range Organics (DRO)	1.9	0.20		mg/L	1	4/14/2016 2:35:05 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	4/14/2016 2:35:05 PM
Surr: DNOP	109	63.2-161		%Rec	1	4/14/2016 2:35:05 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	1.2	0.050		mg/L	1	4/12/2016 5:27:44 PM
Surr: BFB	290	66.4-120	S	%Rec	1	4/12/2016 5:27:44 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	4/18/2016 2:47:49 PM
Toluene	ND	1.0		µg/L	1	4/18/2016 2:47:49 PM
Ethylbenzene	12	1.0		µg/L	1	4/18/2016 2:47:49 PM
Xylenes, Total	15	1.5		µg/L	1	4/18/2016 2:47:49 PM
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	4/18/2016 2:47:49 PM
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	4/18/2016 2:47:49 PM
Surr: Dibromofluoromethane	99.9	70-130		%Rec	1	4/18/2016 2:47:49 PM
Surr: Toluene-d8	98.2	70-130		%Rec	1	4/18/2016 2:47:49 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

26-Apr-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **MB-24771**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031260** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.74		0.5000		148	63.2	161			

Sample ID **LCS-24771**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031261** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.5	0.20	2.500	0	140	65.4	162			
Surr: DNOP	0.37		0.2500		149	63.2	161			

Sample ID **24771-LCS2**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031490** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	124	65.4	162			
Surr: DNOP	0.31		0.2500		126	63.2	161			

Sample ID **24771-LCS3**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031491** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.3	0.20	2.500	0	134	65.4	162			
Surr: DNOP	0.33		0.2500		133	63.2	161			

Sample ID **24771-LCS4**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031492** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0	128	65.4	162			
Surr: DNOP	0.32		0.2500		129	63.2	161			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

26-Apr-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **1604448-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1032110** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	123	73.3	174			
Surr: DNOP	0.23		0.2500		93.5	63.2	161			

Sample ID **1604448-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1032111** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.3	0.20	2.500	0	131	73.3	174	6.26	20	
Surr: DNOP	0.24		0.2500		97.0	63.2	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

26-Apr-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029510** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		88.5	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029511** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	94.5	80	120			
Surr: BFB	20		20.00		100	66.4	120			

Sample ID **1604448-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Lead**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029520** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.51	0.050	0.5000	0.02540	97.4	70	130			
Surr: BFB	20		20.00		101	66.4	120			

Sample ID **1604448-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Lead**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029521** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.51	0.050	0.5000	0.02540	96.0	70	130	1.42	20	
Surr: BFB	20		20.00		102	66.4	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

26-Apr-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034233** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.9		10.00		98.6	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034234** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	116	70	130			
Toluene	22	1.0	20.00	0	110	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		99.8	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		106	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.9		10.00		99.1	70	130			

Sample ID **1604448-001a ms**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lead**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034236** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	24	1.0	20.00	0	119	70	130			
Toluene	23	1.0	20.00	0	115	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID **1604448-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lead**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034237** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	115	70	130	2.91	20	
Toluene	22	1.0	20.00	0	108	70	130	6.34	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

26-Apr-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **1604448-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lead**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034237** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		105	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		103	70	130	0	0	
Surr: Toluene-d8	9.8		10.00		97.9	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1604448 RcptNo: 1

Received by/date: KM 04/12/16

Logged By: **Ashley Gallegos** 4/12/2016 8:45:00 AM

Completed By: **Ashley Gallegos** 4/12/2016 10:20:56 AM

Reviewed By: IO 04/12/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	FedEx		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush _____

Project Name: **GAC - Lead**

Date: 4-7-16

Project #:

PO#12615519

Project Manager:

Sampler:

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1004448	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
4-7-16	1435	H_2O	GAC - Lead	5 VOA	HCl	-001			X							X						
↓	1435	H_2O	GAC - Lead	1-500-ml Amber	Cool													X				
	1425	H_2O	GAC -Inlet	5 VOA	HCl	-002			X							X						
↓	1425	H_2O	GAC -Inlet	1-500-ml Amber	Cool													X				
4-11-16																						

Date:	Time:	Relinquished by:	Received by:	Date	Time
~~4-8-16~~ MW	1615			04/12/16	0845
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 04, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC-Lead 4-7-16 OrderNo.: 1604448

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 4/12/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued April 26, 2016.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC-Lead 4-7-16
Collection Date: 4/7/2016 2:35:00 PM
Lab ID: 1604448-001
Matrix: AQUEOUS
Received Date: 4/12/2016 8:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	4/14/2016 12:31:48 PM	24771
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	4/14/2016 12:31:48 PM	24771
Surr: DNOP	130	63.2-161		%Rec	1	4/14/2016 12:31:48 PM	24771
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	4/12/2016 4:14:16 PM	A33471
Surr: BFB	92.6	66.4-120		%Rec	1	4/12/2016 4:14:16 PM	A33471
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	4/18/2016 2:19:40 PM	A33608
Toluene	ND	1.0		µg/L	1	4/18/2016 2:19:40 PM	A33608
Ethylbenzene	ND	1.0		µg/L	1	4/18/2016 2:19:40 PM	A33608
Methyl tert-butyl ether (MTBE)	1.5	1.0		µg/L	1	4/18/2016 2:19:40 PM	A33608
Xylenes, Total	ND	1.5		µg/L	1	4/18/2016 2:19:40 PM	A33608
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	4/18/2016 2:19:40 PM	A33608
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	4/18/2016 2:19:40 PM	A33608
Surr: Dibromofluoromethane	102	70-130		%Rec	1	4/18/2016 2:19:40 PM	A33608
Surr: Toluene-d8	99.6	70-130		%Rec	1	4/18/2016 2:19:40 PM	A33608

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC-Lead 4-7-16
Collection Date: 4/7/2016 2:25:00 PM
Lab ID: 1604448-002
Matrix: AQUEOUS
Received Date: 4/12/2016 8:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**	
Diesel Range Organics (DRO)	1.9	0.20		mg/L	1	4/14/2016 2:35:05 PM	24771
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	4/14/2016 2:35:05 PM	24771
Surr: DNOP	109	63.2-161		%Rec	1	4/14/2016 2:35:05 PM	24771
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1.2	0.050		mg/L	1	4/12/2016 5:27:44 PM	A33471
Surr: BFB	290	66.4-120	S	%Rec	1	4/12/2016 5:27:44 PM	A33471
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	4/18/2016 2:47:49 PM	A33608
Toluene	ND	1.0		µg/L	1	4/18/2016 2:47:49 PM	A33608
Ethylbenzene	12	1.0		µg/L	1	4/18/2016 2:47:49 PM	A33608
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	4/18/2016 2:47:49 PM	A33608
Xylenes, Total	15	1.5		µg/L	1	4/18/2016 2:47:49 PM	A33608
Surr: 1,2-Dichloroethane-d4	102	70-130		%Rec	1	4/18/2016 2:47:49 PM	A33608
Surr: 4-Bromofluorobenzene	106	70-130		%Rec	1	4/18/2016 2:47:49 PM	A33608
Surr: Dibromofluoromethane	99.9	70-130		%Rec	1	4/18/2016 2:47:49 PM	A33608
Surr: Toluene-d8	98.2	70-130		%Rec	1	4/18/2016 2:47:49 PM	A33608

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

04-May-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **MB-24771**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031260** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.74		0.5000		148	63.2	161			

Sample ID **LCS-24771**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031261** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.5	0.20	2.500	0	140	65.4	162			
Surr: DNOP	0.37		0.2500		149	63.2	161			

Sample ID **24771-LCS2**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031490** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	124	65.4	162			
Surr: DNOP	0.31		0.2500		126	63.2	161			

Sample ID **24771-LCS3**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031491** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.3	0.20	2.500	0	134	65.4	162			
Surr: DNOP	0.33		0.2500		133	63.2	161			

Sample ID **24771-LCS4**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1031492** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0	128	65.4	162			
Surr: DNOP	0.32		0.2500		129	63.2	161			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

04-May-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **1604448-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1032110** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	123	73.3	174			
Surr: DNOP	0.23		0.2500		93.5	63.2	161			

Sample ID **1604448-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **24771**	RunNo: **33517**
Prep Date: **4/13/2016**	Analysis Date: **4/14/2016**	SeqNo: **1032111** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.3	0.20	2.500	0	131	73.3	174	6.26	20	
Surr: DNOP	0.24		0.2500		97.0	63.2	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

04-May-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029510** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		88.5	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029511** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.47	0.050	0.5000	0	94.5	80	120			
Surr: BFB	20		20.00		100	66.4	120			

Sample ID **1604448-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Lead**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029520** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.51	0.050	0.5000	0.02540	97.4	70	130			
Surr: BFB	20		20.00		101	66.4	120			

Sample ID **1604448-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Lead**	Batch ID: **A33471**	RunNo: **33471**
Prep Date:	Analysis Date: **4/12/2016**	SeqNo: **1029521** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.51	0.050	0.5000	0.02540	96.0	70	130	1.42	20	
Surr: BFB	20		20.00		102	66.4	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

04-May-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034233** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		105	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		102	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.9		10.00		98.6	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034234** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	116	70	130			
Toluene	22	1.0	20.00	0	110	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		99.8	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		106	70	130			
Surr: Dibromofluoromethane	10		10.00		103	70	130			
Surr: Toluene-d8	9.9		10.00		99.1	70	130			

Sample ID **1604448-001a ms**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lead**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034236** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	24	1.0	20.00	0	119	70	130			
Toluene	23	1.0	20.00	0	115	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		104	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	10		10.00		103	70	130			

Sample ID **1604448-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lead**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034237** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	23	1.0	20.00	0	115	70	130	2.91	20	

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- B Analyte detected in the associated Method Blank
- D Sample Diluted Due to Matrix
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S % Recovery outside of range due to dilution or matrix
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1604448**

04-May-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 4-7-16

Sample ID **1604448-001a msd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **GAC-Lead**	Batch ID: **A33608**	RunNo: **33608**
Prep Date:	Analysis Date: **4/18/2016**	SeqNo: **1034237** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	22	1.0	20.00	0	108	70	130	6.34	20	
Surr: 1,2-Dichloroethane-d4	11		10.00		107	70	130	0	0	
Surr: 4-Bromofluorobenzene	10		10.00		105	70	130	0	0	
Surr: Dibromofluoromethane	10		10.00		103	70	130	0	0	
Surr: Toluene-d8	9.8		10.00		97.9	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1604448 RcptNo: 1

Received by/date: KM 04/12/16

Logged By: **Ashley Gallegos** 4/12/2016 8:45:00 AM

Completed By: **Ashley Gallegos** 4/12/2016 10:20:56 AM

Reviewed By: IO 04/12/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	FedEx		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.6	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush _____

Project Name: **GAC - Lead**

Date: 4-7-16

Project #:

PO#12615519

Project Manager:

Sampler:

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.6

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1004448	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
4-7-16	1435	H_2O	GAC - Lead	5 VOA	HCl	-001			X							X						
↓	1435	H_2O	GAC - Lead	1-500-ml Amber	Cool													X				
	1425	H_2O	GAC -Inlet	5 VOA	HCl	-002			X							X						
↓	1425	H_2O	GAC -Inlet	1-500-ml Amber	Cool													X				
4-11-16																						

Date:	Time:	Relinquished by:	Received by:	Date	Time
~~4-8-16~~ MW	1615			04/12/16	0845
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

May 24, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC Lead 5-4-2016 OrderNo.: 1605208

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 5/5/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1605208**
Date Reported: **5/24/2016**

CLIENT: Western Refining Southwest, Inc.
Project: GAC Lead 5-4-2016
Lab ID: 1605208-001 **Matrix:** AQUEOUS

Client Sample ID: GAC-Lead
Collection Date: 5/4/2016 11:00:00 AM
Received Date: 5/5/2016 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	5/12/2016 1:17:48 PM	25259
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/12/2016 1:17:48 PM	25259
Surr: DNOP	111	63.2-161		%Rec	1	5/12/2016 1:17:48 PM	25259
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	5/9/2016 11:02:40 AM	A34079
Surr: BFB	91.4	66.4-120		%Rec	1	5/9/2016 11:02:40 AM	A34079
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	5/10/2016 7:14:00 PM	B34127
Toluene	ND	1.0		µg/L	1	5/10/2016 7:14:00 PM	B34127
Ethylbenzene	ND	1.0		µg/L	1	5/10/2016 7:14:00 PM	B34127
Methyl tert-butyl ether (MTBE)	1.1	1.0		µg/L	1	5/10/2016 7:14:00 PM	B34127
Xylenes, Total	ND	1.5		µg/L	1	5/10/2016 7:14:00 PM	B34127
Surr: 1,2-Dichloroethane-d4	90.6	70-130		%Rec	1	5/10/2016 7:14:00 PM	B34127
Surr: 4-Bromofluorobenzene	98.9	70-130		%Rec	1	5/10/2016 7:14:00 PM	B34127
Surr: Dibromofluoromethane	86.2	70-130		%Rec	1	5/10/2016 7:14:00 PM	B34127
Surr: Toluene-d8	97.0	70-130		%Rec	1	5/10/2016 7:14:00 PM	B34127

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC Lead 5-4-2016
Collection Date: 5/4/2016 10:50:00 AM
Lab ID: 1605208-002 **Matrix:** AQUEOUS **Received Date:** 5/5/2016 7:15:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **KJH**	
Diesel Range Organics (DRO)	1.3	0.20		mg/L	1	5/12/2016 2:23:14 PM	25259
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	5/12/2016 2:23:14 PM	25259
Surr: DNOP	118	63.2-161		%Rec	1	5/12/2016 2:23:14 PM	25259
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1.3	0.050		mg/L	1	5/9/2016 11:27:15 AM	A34079
Surr: BFB	295	66.4-120	S	%Rec	1	5/9/2016 11:27:15 AM	A34079
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	5/10/2016 7:38:00 PM	B34127
Toluene	ND	1.0		µg/L	1	5/10/2016 7:38:00 PM	B34127
Ethylbenzene	10	1.0		µg/L	1	5/10/2016 7:38:00 PM	B34127
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	5/10/2016 7:38:00 PM	B34127
Xylenes, Total	31	1.5		µg/L	1	5/10/2016 7:38:00 PM	B34127
Surr: 1,2-Dichloroethane-d4	92.2	70-130		%Rec	1	5/10/2016 7:38:00 PM	B34127
Surr: 4-Bromofluorobenzene	96.0	70-130		%Rec	1	5/10/2016 7:38:00 PM	B34127
Surr: Dibromofluoromethane	88.3	70-130		%Rec	1	5/10/2016 7:38:00 PM	B34127
Surr: Toluene-d8	98.1	70-130		%Rec	1	5/10/2016 7:38:00 PM	B34127

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1605208**

24-May-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 5-4-2016

Sample ID **1605208-001CMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **25259**	RunNo: **34172**
Prep Date: **5/11/2016**	Analysis Date: **5/12/2016**	SeqNo: **1053992** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.7	0.20	2.500	0	108	73.3	174			
Surr: DNOP	0.28		0.2500		113	63.2	161			

Sample ID **1605208-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **25259**	RunNo: **34172**
Prep Date: **5/11/2016**	Analysis Date: **5/12/2016**	SeqNo: **1053993** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.8	0.20	2.500	0	112	73.3	174	3.73	20	
Surr: DNOP	0.30		0.2500		118	63.2	161	0	0	

Sample ID **LCS-25259**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **25259**	RunNo: **34172**
Prep Date: **5/11/2016**	Analysis Date: **5/12/2016**	SeqNo: **1053995** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.8	0.20	2.500	0	111	65.4	162			
Surr: DNOP	0.27		0.2500		109	63.2	161			

Sample ID **MB-25259**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **25259**	RunNo: **34172**
Prep Date: **5/11/2016**	Analysis Date: **5/12/2016**	SeqNo: **1053996** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.59		0.5000		117	63.2	161			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1605208**

24-May-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 5-4-2016

Sample ID	**5ML RB**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**PBW**	Batch ID:	**A34079**		RunNo:	**34079**					
Prep Date:		Analysis Date:	**5/9/2016**		SeqNo:	**1050450**	Units:	**mg/L**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		ND	0.050								
Surr: BFB		18		20.00		91.8	66.4	120			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSW**	Batch ID:	**A34079**		RunNo:	**34079**					
Prep Date:		Analysis Date:	**5/9/2016**		SeqNo:	**1050451**	Units:	**mg/L**			
Analyte		Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)		0.45	0.050	0.5000	0	89.4	80	120			
Surr: BFB		21		20.00		106	66.4	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1605208**

24-May-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 5-4-2016

Sample ID **100ng LCS**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **B34127**	RunNo: **34127**
Prep Date:	Analysis Date: **5/10/2016**	SeqNo: **1052228** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	95.2	70	130			
Toluene	21	1.0	20.00	0	105	70	130			
Surr: 1,2-Dichloroethane-d4	9.5		10.00		94.9	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.6	70	130			
Surr: Dibromofluoromethane	9.3		10.00		93.5	70	130			
Surr: Toluene-d8	10		10.00		100	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **B34127**	RunNo: **34127**
Prep Date:	Analysis Date: **5/10/2016**	SeqNo: **1052229** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.5		10.00		95.1	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	9.2		10.00		91.8	70	130			
Surr: Toluene-d8	9.9		10.00		98.7	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1605208 RcptNo: 1

Received by/date: 05/05/16

Logged By: Lindsay Mangin 5/5/2016 7:15:00 AM

Completed By: Lindsay Mangin 5/5/2016 9:23:34 AM

Reviewed By: 05/05/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.5	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard ☒ Level 4 (Full Validation)

☐ Other _____

☒ EDD (Type) _____

Turn-Around Time:

☒ Standard ☐ Rush _____

Project Name: **GAC - Lead**

Date: 5-4-2016

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: M. Wicker

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.5

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1605208	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
5-4-16	1100	H_2O	GAC - Lead	5 VOA	HCl	-001			X							X						
↓	1100	H_2O	GAC - Lead	1-500-ml Amber	Cool	-001												X				
↓	1050	H_2O	GAC -Inlet	5 VOA	HCl	-002			X							X						
↓	1050	H_2O	GAC -Inlet	1-500-ml Amber	Cool	-002												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
5-4-16	1535			5/4/16	1535
5/4/16	1740			05/05/16	0715

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

July 05, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC 6-1-16 OrderNo.: 1606077

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 6/2/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Lag
Project: GAC 6-1-16
Collection Date: 6/1/2016 10:20:00 AM
Lab ID: 1606077-001
Matrix: AQUEOUS
Received Date: 6/2/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	6/7/2016 12:45:33 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	6/7/2016 12:45:33 PM
Surr: DNOP	114	63.2-161		%Rec	1	6/7/2016 12:45:33 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	6/3/2016 1:21:04 PM
Surr: BFB	84.2	66.4-120		%Rec	1	6/3/2016 1:21:04 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	ND	1.0		µg/L	1	6/10/2016 7:43:00 PM
Toluene	ND	1.0		µg/L	1	6/10/2016 7:43:00 PM
Ethylbenzene	ND	1.0		µg/L	1	6/10/2016 7:43:00 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	6/10/2016 7:43:00 PM
Xylenes, Total	ND	1.5		µg/L	1	6/10/2016 7:43:00 PM
Surr: 1,2-Dichloroethane-d4	92.9	70-130		%Rec	1	6/10/2016 7:43:00 PM
Surr: 4-Bromofluorobenzene	100	70-130		%Rec	1	6/10/2016 7:43:00 PM
Surr: Dibromofluoromethane	96.5	70-130		%Rec	1	6/10/2016 7:43:00 PM
Surr: Toluene-d8	99.5	70-130		%Rec	1	6/10/2016 7:43:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc. **Client Sample ID:** Lead
Project: GAC 6-1-16 **Collection Date:** 6/1/2016 10:30:00 AM
Lab ID: 1606077-002 **Matrix:** AQUEOUS **Received Date:** 6/2/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	6/7/2016 1:50:58 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	6/7/2016 1:50:58 PM
Surr: DNOP	126	63.2-161		%Rec	1	6/7/2016 1:50:58 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	6/3/2016 1:45:34 PM
Surr: BFB	87.3	66.4-120		%Rec	1	6/3/2016 1:45:34 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	ND	1.0		µg/L	1	6/10/2016 8:06:00 PM
Toluene	ND	1.0		µg/L	1	6/10/2016 8:06:00 PM
Ethylbenzene	ND	1.0		µg/L	1	6/10/2016 8:06:00 PM
Methyl tert-butyl ether (MTBE)	1.2	1.0		µg/L	1	6/10/2016 8:06:00 PM
Xylenes, Total	ND	1.5		µg/L	1	6/10/2016 8:06:00 PM
Surr: 1,2-Dichloroethane-d4	91.8	70-130		%Rec	1	6/10/2016 8:06:00 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	6/10/2016 8:06:00 PM
Surr: Dibromofluoromethane	96.9	70-130		%Rec	1	6/10/2016 8:06:00 PM
Surr: Toluene-d8	99.2	70-130		%Rec	1	6/10/2016 8:06:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Inlet
Project: GAC 6-1-16
Collection Date: 6/1/2016 10:40:00 AM
Lab ID: 1606077-003
Matrix: AQUEOUS
Received Date: 6/2/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**
Diesel Range Organics (DRO)	0.23	0.20		mg/L	1	6/7/2016 2:12:47 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	6/7/2016 2:12:47 PM
Surr: DNOP	115	63.2-161		%Rec	1	6/7/2016 2:12:47 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.15	0.050		mg/L	1	6/3/2016 2:10:02 PM
Surr: BFB	116	66.4-120		%Rec	1	6/3/2016 2:10:02 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**
Benzene	1.1	1.0		µg/L	1	6/10/2016 8:29:00 PM
Toluene	ND	1.0		µg/L	1	6/10/2016 8:29:00 PM
Ethylbenzene	1.2	1.0		µg/L	1	6/10/2016 8:29:00 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	6/10/2016 8:29:00 PM
Xylenes, Total	ND	1.5		µg/L	1	6/10/2016 8:29:00 PM
Surr: 1,2-Dichloroethane-d4	91.8	70-130		%Rec	1	6/10/2016 8:29:00 PM
Surr: 4-Bromofluorobenzene	103	70-130		%Rec	1	6/10/2016 8:29:00 PM
Surr: Dibromofluoromethane	94.8	70-130		%Rec	1	6/10/2016 8:29:00 PM
Surr: Toluene-d8	98.2	70-130		%Rec	1	6/10/2016 8:29:00 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606077**

05-Jul-16

Client: Western Refining Southwest, Inc.

Project: GAC 6-1-16

Sample ID **MB-25701**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **25701**	RunNo: **34721**
Prep Date: **6/7/2016**	Analysis Date: **6/7/2016**	SeqNo: **1071758** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.56		0.5000		113	63.2	161			

Sample ID **LCS-25701**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **25701**	RunNo: **34721**
Prep Date: **6/7/2016**	Analysis Date: **6/7/2016**	SeqNo: **1071759** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.0	0.20	2.500	0	120	65.4	162			
Surr: DNOP	0.27		0.2500		107	63.2	161			

Sample ID **1606077-001CMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **Lag**	Batch ID: **25701**	RunNo: **34721**
Prep Date: **6/7/2016**	Analysis Date: **6/7/2016**	SeqNo: **1071765** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.9	0.20	2.500	0	115	73.3	174			
Surr: DNOP	0.26		0.2500		105	63.2	161			

Sample ID **1606077-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **Lag**	Batch ID: **25701**	RunNo: **34721**
Prep Date: **6/7/2016**	Analysis Date: **6/7/2016**	SeqNo: **1071766** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	123	73.3	174	6.87	20	
Surr: DNOP	0.28		0.2500		113	63.2	161	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606077**

05-Jul-16

Client: Western Refining Southwest, Inc.

Project: GAC 6-1-16

Sample ID	**5ML RB**	SampType:	**MBLK**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**PBW**	Batch ID:	**B34677**		RunNo:	**34677**				
Prep Date:		Analysis Date:	**6/3/2016**		SeqNo:	**1070400**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		89.4	66.4	120			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**		TestCode:	**EPA Method 8015D: Gasoline Range**				
Client ID:	**LCSW**	Batch ID:	**B34677**		RunNo:	**34677**				
Prep Date:		Analysis Date:	**6/3/2016**		SeqNo:	**1070401**	Units:	**mg/L**		
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.49	0.050	0.5000	0	98.5	80	120			
Surr: BFB	20		20.00		102	66.4	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1606077**

05-Jul-16

Client: Western Refining Southwest, Inc.

Project: GAC 6-1-16

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **A34856**	RunNo: **34856**
Prep Date:	Analysis Date: **6/10/2016**	SeqNo: **1076410** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	93.5	70	130			
Toluene	19	1.0	20.00	0	96.8	70	130			
Surr: 1,2-Dichloroethane-d4	9.2		10.00		92.4	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.9	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.0	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **A34856**	RunNo: **34856**
Prep Date:	Analysis Date: **6/10/2016**	SeqNo: **1076411** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.8		10.00		98.2	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.5	70	130			
Surr: Dibromofluoromethane	9.7		10.00		96.8	70	130			
Surr: Toluene-d8	10		10.00		99.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1606077** RcptNo: **1**

Received by/date: 06/02/16

Logged By: **Lindsay Mangin** **6/2/2016 7:30:00 AM**

Completed By: **Lindsay Mangin** **6/2/2016 9:23:21 AM**

Reviewed By: 06/02/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date:

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.1	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard **X** Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ **Rush**_____

Project Name: **GAC**

6-1-16

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1606077	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / ~~DRO~~ / ~~MRO~~)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015 B DRO Extented	Air Bubbles (Y or N)
6-1-16	1020	H_2O	Lag	5 - VOA	HCl	-001			x							x			
↓	↓	H_2O	Lag	1 - Amber	Cool	-001												x	
	1030	H_2O	Lead	5 - VOA	HCl	-002			x							x			
	↓	H_2O	Lead	1 - Amber	Cool	-002												x	
	1040	H_2O	Inlet	5 - VOA	HCl	-003			x							x			
↓	↓	H_2O	Inlet	1 - Amber	Cool	-003												x	

Date:	Time:	Relinquished by:	Received by:	Date	Time
6-1-16	1611		Christine Walls	6/1/16	1611
Date:	Time:	Relinquished by:	Received by:	Date	Time
6/1/16	1824			06/02/16	0730

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 03, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC Lead 7-14-2016 OrderNo.: 1607715

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 7/15/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1607715**
Date Reported: **8/3/2016**

CLIENT: Western Refining Southwest, Inc.
Project: GAC Lead 7-14-2016
Lab ID: 1607715-001 **Matrix:** AQUEOUS

Client Sample ID: GAC-Lead
Collection Date: 7/14/2016 3:30:00 PM
Received Date: 7/15/2016 7:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	7/21/2016 4:15:28 AM	26463
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	7/21/2016 4:15:28 AM	26463
Surr: DNOP	130	67.9-149		%Rec	1	7/21/2016 4:15:28 AM	26463
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	7/20/2016 6:31:58 PM	B35832
Surr: BFB	92.4	66.4-120		%Rec	1	7/20/2016 6:31:58 PM	B35832
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **BCN**	
Benzene	ND	1.0		µg/L	1	7/20/2016 6:13:00 PM	C35848
Toluene	ND	1.0		µg/L	1	7/20/2016 6:13:00 PM	C35848
Ethylbenzene	ND	1.0		µg/L	1	7/20/2016 6:13:00 PM	C35848
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	7/20/2016 6:13:00 PM	C35848
Xylenes, Total	ND	1.5		µg/L	1	7/20/2016 6:13:00 PM	C35848
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	1	7/20/2016 6:13:00 PM	C35848
Surr: 4-Bromofluorobenzene	105	70-130		%Rec	1	7/20/2016 6:13:00 PM	C35848
Surr: Dibromofluoromethane	99.0	70-130		%Rec	1	7/20/2016 6:13:00 PM	C35848
Surr: Toluene-d8	93.7	70-130		%Rec	1	7/20/2016 6:13:00 PM	C35848

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC Lead 7-14-2016
Collection Date: 7/14/2016 3:45:00 PM
Lab ID: 1607715-002 **Matrix:** AQUEOUS **Received Date:** 7/15/2016 7:50:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	0.81	0.20		mg/L	1	7/21/2016 5:21:03 AM	26463
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	7/21/2016 5:21:03 AM	26463
Surr: DNOP	126	67.9-149		%Rec	1	7/21/2016 5:21:03 AM	26463
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	5.4	0.50		mg/L	10	7/20/2016 6:56:28 PM	B35832
Surr: BFB	118	66.4-120		%Rec	10	7/20/2016 6:56:28 PM	B35832
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**	
Benzene	ND	1.0		µg/L	1	7/22/2016 8:22:53 PM	C35935
Toluene	ND	1.0		µg/L	1	7/22/2016 8:22:53 PM	C35935
Ethylbenzene	290	10		µg/L	10	7/20/2016 6:37:00 PM	C35848
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	7/22/2016 8:22:53 PM	C35935
Xylenes, Total	1500	15		µg/L	10	7/20/2016 6:37:00 PM	C35848
Surr: 1,2-Dichloroethane-d4	91.9	70-130		%Rec	1	7/22/2016 8:22:53 PM	C35935
Surr: 4-Bromofluorobenzene	123	70-130		%Rec	1	7/22/2016 8:22:53 PM	C35935
Surr: Dibromofluoromethane	95.0	70-130		%Rec	1	7/22/2016 8:22:53 PM	C35935
Surr: Toluene-d8	97.6	70-130		%Rec	1	7/22/2016 8:22:53 PM	C35935

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1607715**

03-Aug-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 7-14-2016

Sample ID **1607715-001CMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **26463**	RunNo: **35794**
Prep Date: **7/20/2016**	Analysis Date: **7/21/2016**	SeqNo: **1110170** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0	128	73.3	174			
Surr: DNOP	0.33		0.2500		133	67.9	149			

Sample ID **1607715-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **26463**	RunNo: **35794**
Prep Date: **7/20/2016**	Analysis Date: **7/21/2016**	SeqNo: **1110171** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	122	73.3	174	4.36	20	
Surr: DNOP	0.33		0.2500		131	67.9	149	0	0	

Sample ID **LCS-26463**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **26463**	RunNo: **35794**
Prep Date: **7/20/2016**	Analysis Date: **7/21/2016**	SeqNo: **1110173** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.5	0.20	2.500	0	138	65.4	162			
Surr: DNOP	0.36		0.2500		145	67.9	149			

Sample ID **MB-26463**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **26463**	RunNo: **35794**
Prep Date: **7/20/2016**	Analysis Date: **7/21/2016**	SeqNo: **1110174** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.58		0.5000		116	67.9	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1607715**

03-Aug-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 7-14-2016

Sample ID	**5ML RB**	SampType:	**MBLK**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**PBW**	Batch ID:	**B35832**	RunNo:	**35832**					
Prep Date:		Analysis Date:	**7/20/2016**	SeqNo:	**1109432**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	17		20.00		86.2	66.4	120			

Sample ID	**2.5UG GRO LCS**	SampType:	**LCS**	TestCode:	**EPA Method 8015D: Gasoline Range**					
Client ID:	**LCSW**	Batch ID:	**B35832**	RunNo:	**35832**					
Prep Date:		Analysis Date:	**7/20/2016**	SeqNo:	**1109433**	Units:	**mg/L**			
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.54	0.050	0.5000	0	109	80	120			
Surr: BFB	18		20.00		89.6	66.4	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1607715**

03-Aug-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 7-14-2016

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **C35848**	RunNo: **35848**
Prep Date:	Analysis Date: **7/20/2016**	SeqNo: **1109755** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	21	1.0	20.00	0	107	70	130			
Toluene	19	1.0	20.00	0	95.6	70	130			
Surr: 1,2-Dichloroethane-d4	12		10.00		116	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		107	70	130			
Surr: Dibromofluoromethane	11		10.00		106	70	130			
Surr: Toluene-d8	9.4		10.00		93.5	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **C35848**	RunNo: **35848**
Prep Date:	Analysis Date: **7/20/2016**	SeqNo: **1110132** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	11		10.00		112	70	130			
Surr: 4-Bromofluorobenzene	11		10.00		115	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.4		10.00		93.8	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **C35935**	RunNo: **35935**
Prep Date:	Analysis Date: **7/22/2016**	SeqNo: **1112466** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Surr: 1,2-Dichloroethane-d4	10		10.00		103	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		99.8	70	130			
Surr: Dibromofluoromethane	11		10.00		108	70	130			
Surr: Toluene-d8	10		10.00		99.5	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **C35935**	RunNo: **35935**
Prep Date:	Analysis Date: **7/22/2016**	SeqNo: **1112469** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual

Qualifiers:

- * Value exceeds Maximum Contaminant Level.
- B Analyte detected in the associated Method Blank
- D Sample Diluted Due to Matrix
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- P Sample pH Not In Range
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S % Recovery outside of range due to dilution or matrix
- W Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1607715**

03-Aug-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 7-14-2016

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **C35935**	RunNo: **35935**
Prep Date:	Analysis Date: **7/22/2016**	SeqNo: **1112469** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	70	130			
Toluene	20	1.0	20.00	0	101	70	130			
Surr: 1,2-Dichloroethane-d4	9.4		10.00		94.4	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		101	70	130			
Surr: Dibromofluoromethane	10		10.00		105	70	130			
Surr: Toluene-d8	9.9		10.00		99.4	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: Western Refining Southw Work Order Number: 1607715 RcptNo: 1

Received by/date: [signature] 07/15/16

Logged By: Lindsay Mangin 7/15/2016 7:50:00 AM [signature]

Completed By: Lindsay Mangin 7/15/2016 10:51:57 AM [signature]

Reviewed By: IC 7/15/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. Cooler Information

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	1.4	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush _____

Project Name: **GAC - Lead**

Date: 7-14-2016

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: ☑ Yes ☐ No

Sample Temperature: 1.4

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1607715	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
7-14-16	1530	H_2O	GAC - Lead	5 VOA	HCl	-001			X							X						
↓	↓	H_2O	GAC - Lead	1-500-ml Amber	Cool	-001												X				
↓	1545	H_2O	GAC -Inlet	5 VOA	HCl	-002			X							X						
↓	↓	H_2O	GAC -Inlet	1-500-ml Amber	Cool	-002												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
7-14-16	1650		Chet Waek	7/14/16	1650
7/14/16	1941	Christin Walters		07/15/16	0750

Remarks: Internal Note: North tank lead

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

August 26, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC-Lead OrderNo.: 1608686

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 8/11/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1608686**
Date Reported: **8/26/2016**

CLIENT: Western Refining Southwest, Inc.
Project: GAC-Lead
Lab ID: 1608686-001 **Matrix:** AQUEOUS

Client Sample ID: GAC-Lead
Collection Date: 8/10/2016 12:00:00 PM
Received Date: 8/11/2016 6:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	8/15/2016 11:30:43 PM	26971
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	8/15/2016 11:30:43 PM	26971
Surr: DNOP	122	67.9-149		%Rec	1	8/15/2016 11:30:43 PM	26971
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	8/17/2016 12:34:52 PM	A36586
Surr: BFB	80.4	66.4-120		%Rec	1	8/17/2016 12:34:52 PM	A36586
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	ND	1.0		µg/L	1	8/12/2016 5:56:00 PM	R36482
Toluene	ND	1.0		µg/L	1	8/12/2016 5:56:00 PM	R36482
Ethylbenzene	ND	1.0		µg/L	1	8/12/2016 5:56:00 PM	R36482
Methyl tert-butyl ether (MTBE)	1.5	1.0		µg/L	1	8/12/2016 5:56:00 PM	R36482
Xylenes, Total	ND	1.5		µg/L	1	8/12/2016 5:56:00 PM	R36482
Surr: 1,2-Dichloroethane-d4	101	70-130		%Rec	1	8/12/2016 5:56:00 PM	R36482
Surr: 4-Bromofluorobenzene	99.0	70-130		%Rec	1	8/12/2016 5:56:00 PM	R36482
Surr: Dibromofluoromethane	95.9	70-130		%Rec	1	8/12/2016 5:56:00 PM	R36482
Surr: Toluene-d8	99.5	70-130		%Rec	1	8/12/2016 5:56:00 PM	R36482

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC-Lead
Collection Date: 8/10/2016 11:50:00 AM
Lab ID: 1608686-002 **Matrix:** AQUEOUS **Received Date:** 8/11/2016 6:45:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	1.5	0.20		mg/L	1	8/16/2016 12:35:58 AM	26971
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	8/16/2016 12:35:58 AM	26971
Surr: DNOP	115	67.9-149		%Rec	1	8/16/2016 12:35:58 AM	26971
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	1.4	0.50		mg/L	10	8/17/2016 12:59:30 PM	A36586
Surr: BFB	104	66.4-120		%Rec	10	8/17/2016 12:59:30 PM	A36586
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **RAA**	
Benzene	1.1	1.0		µg/L	1	8/12/2016 6:19:00 PM	R36482
Toluene	ND	1.0		µg/L	1	8/12/2016 6:19:00 PM	R36482
Ethylbenzene	100	10		µg/L	10	8/12/2016 7:44:00 PM	R36482
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	8/12/2016 6:19:00 PM	R36482
Xylenes, Total	210	15		µg/L	10	8/12/2016 7:44:00 PM	R36482
Surr: 1,2-Dichloroethane-d4	97.2	70-130		%Rec	1	8/12/2016 6:19:00 PM	R36482
Surr: 4-Bromofluorobenzene	95.4	70-130		%Rec	1	8/12/2016 6:19:00 PM	R36482
Surr: Dibromofluoromethane	92.2	70-130		%Rec	1	8/12/2016 6:19:00 PM	R36482
Surr: Toluene-d8	100	70-130		%Rec	1	8/12/2016 6:19:00 PM	R36482

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1608686**

26-Aug-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead

Sample ID **1608686-001CMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **26971**	RunNo: **36497**
Prep Date: **8/15/2016**	Analysis Date: **8/15/2016**	SeqNo: **1130687** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.7	0.20	2.500	0	107	73.3	174			
Surr: DNOP	0.27		0.2500		108	67.9	149			

Sample ID **1608686-001CMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **26971**	RunNo: **36497**
Prep Date: **8/15/2016**	Analysis Date: **8/16/2016**	SeqNo: **1130688** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.5	0.20	2.500	0	139	73.3	174	25.8	20	R
Surr: DNOP	0.35		0.2500		142	67.9	149	0	0	

Sample ID **LCS-26971**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **26971**	RunNo: **36497**
Prep Date: **8/15/2016**	Analysis Date: **8/15/2016**	SeqNo: **1130695** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.6	0.20	2.500	0	106	65.4	162			
Surr: DNOP	0.27		0.2500		108	67.9	149			

Sample ID **MB-26971**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **26971**	RunNo: **36497**
Prep Date: **8/15/2016**	Analysis Date: **8/15/2016**	SeqNo: **1130696** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.57		0.5000		115	67.9	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1608686**

26-Aug-16

Client: Western Refining Southwest, Inc.
Project: GAC-Lead

Sample ID **5ML RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **A36586**	RunNo: **36586**
Prep Date:	Analysis Date: **8/17/2016**	SeqNo: **1132878** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	16		20.00		80.3	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **A36586**	RunNo: **36586**
Prep Date:	Analysis Date: **8/17/2016**	SeqNo: **1132880** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.44	0.050	0.5000	0	88.6	80	120			
Surr: BFB	18		20.00		90.1	66.4	120			

Sample ID **1608686-002BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Inlet**	Batch ID: **A36586**	RunNo: **36586**
Prep Date:	Analysis Date: **8/17/2016**	SeqNo: **1132890** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	6.2	0.50	5.000	1.396	95.2	70	130			
Surr: BFB	220		200.0		111	66.4	120			

Sample ID **1608686-002BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Inlet**	Batch ID: **A36586**	RunNo: **36586**
Prep Date:	Analysis Date: **8/17/2016**	SeqNo: **1132891** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	5.8	0.50	5.000	1.396	88.2	70	130	5.92	20	
Surr: BFB	220		200.0		110	66.4	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1608686**

26-Aug-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **R36482**	RunNo: **36482**
Prep Date:	Analysis Date: **8/12/2016**	SeqNo: **1129786** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	88.3	70	130			
Toluene	18	1.0	20.00	0	91.4	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.3	70	130			
Surr: Dibromofluoromethane	9.6		10.00		96.1	70	130			
Surr: Toluene-d8	10		10.00		101	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **R36482**	RunNo: **36482**
Prep Date:	Analysis Date: **8/12/2016**	SeqNo: **1129787** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	10		10.00		100	70	130			
Surr: Dibromofluoromethane	9.7		10.00		96.9	70	130			
Surr: Toluene-d8	10		10.00		100	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1608686** RcptNo: 1

Received by/date: 08/11/16

Logged By: **Lindsay Mangin** **8/11/2016 6:45:00 AM**

Completed By: **Lindsay Mangin** **8/11/2016 2:12:21 PM**

Reviewed By: aJ 08/12/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.1	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

Email or Fax#:

QA/QC Package:

[ ] Standard **X** Level 4 (Full Validation)

[ ] Other

[ ] EDD (Type)

Turn-Around Time:

X Standard ☐ Rush

Project Name: **GAC - Lead**

Date: 8-10-2016

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: ☑ Yes ☐ No

Sample Temperature: 2.1

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1608686
8-10-16	1200	H_2O	GAC - Lead	5 VOA	HCl	-001
	↓	" "	GAC - Lead	1-500-ml	Amber	-001
	1150	H_2O	GAC -Inlet	5 VOA	HCl	-002
	↓	" "	GAC -Inlet	1-500-ml	Amber	-002
		~~H_2O~~	~~GAC -Lag~~	~~5 VOA~~	~~HCl~~ MW	
		" "	~~GAC -Lag~~	~~1-500-ml~~	~~Amber~~ MW	

Analysis Request

BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / ~~DRO / MRO~~)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
		X							X						
											X				
		X							X						
											X				
		~~X~~	MW						~~X~~						
											~~X~~				

Date:	Time:	Relinquished by:	Received by:	Date	Time
8-10-16	1555		Christine Walls	8/10/16	1554
8/10/16	2040	Christine Walls		08/11/16	0845

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

September 27, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC 9-8-2016 OrderNo.: 1609433

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 9/9/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1609433**
Date Reported: **9/27/2016**

CLIENT: Western Refining Southwest, Inc.
Project: GAC 9-8-2016
Lab ID: 1609433-001 **Matrix:** AQUEOUS

Client Sample ID: Lag
Collection Date: 9/8/2016 11:00:00 AM
Received Date: 9/9/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	9/12/2016 3:12:01 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	9/12/2016 3:12:01 PM
Surr: DNOP	144	67.9-149		%Rec	1	9/12/2016 3:12:01 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**
Benzene	ND	1.0		µg/L	1	9/12/2016 12:10:12 PM
Toluene	ND	1.0		µg/L	1	9/12/2016 12:10:12 PM
Ethylbenzene	ND	1.0		µg/L	1	9/12/2016 12:10:12 PM
Xylenes, Total	ND	1.5		µg/L	1	9/12/2016 12:10:12 PM
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	9/12/2016 12:10:12 PM
Surr: 4-Bromofluorobenzene	98.3	70-130		%Rec	1	9/12/2016 12:10:12 PM
Surr: Dibromofluoromethane	96.4	70-130		%Rec	1	9/12/2016 12:10:12 PM
Surr: Toluene-d8	96.5	70-130		%Rec	1	9/12/2016 12:10:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	9/12/2016 12:10:12 PM
Surr: BFB	99.0	70-130		%Rec	1	9/12/2016 12:10:12 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Lead
Project: GAC 9-8-2016
Collection Date: 9/5/2016 11:10:00 AM
Lab ID: 1609433-002
Matrix: AQUEOUS
Received Date: 9/9/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	9/12/2016 4:17:14 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	9/12/2016 4:17:14 PM
Surr: DNOP	150	67.9-149	S	%Rec	1	9/12/2016 4:17:14 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**
Benzene	ND	1.0		µg/L	1	9/12/2016 1:36:45 PM
Toluene	ND	1.0		µg/L	1	9/12/2016 1:36:45 PM
Ethylbenzene	ND	1.0		µg/L	1	9/12/2016 1:36:45 PM
Xylenes, Total	ND	1.5		µg/L	1	9/12/2016 1:36:45 PM
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	9/12/2016 1:36:45 PM
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	9/12/2016 1:36:45 PM
Surr: Dibromofluoromethane	102	70-130		%Rec	1	9/12/2016 1:36:45 PM
Surr: Toluene-d8	101	70-130		%Rec	1	9/12/2016 1:36:45 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	9/12/2016 1:36:45 PM
Surr: BFB	102	70-130		%Rec	1	9/12/2016 1:36:45 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Inlet
Project: GAC 9-8-2016
Collection Date: 9/8/2016 11:20:00 AM
Lab ID: 1609433-003
Matrix: AQUEOUS
Received Date: 9/9/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	0.60	0.20		mg/L	1	9/13/2016 2:41:13 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	9/13/2016 2:41:13 PM
Surr: DNOP	122	67.9-149		%Rec	1	9/13/2016 2:41:13 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**
Benzene	ND	1.0		µg/L	1	9/12/2016 3:31:53 PM
Toluene	ND	1.0		µg/L	1	9/12/2016 3:31:53 PM
Ethylbenzene	21	1.0		µg/L	1	9/12/2016 3:31:53 PM
Xylenes, Total	8.1	1.5		µg/L	1	9/12/2016 3:31:53 PM
Surr: 1,2-Dichloroethane-d4	87.3	70-130		%Rec	1	9/12/2016 3:31:53 PM
Surr: 4-Bromofluorobenzene	60.1	70-130	S	%Rec	1	9/12/2016 3:31:53 PM
Surr: Dibromofluoromethane	84.6	70-130		%Rec	1	9/12/2016 3:31:53 PM
Surr: Toluene-d8	100	70-130		%Rec	1	9/12/2016 3:31:53 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**
Gasoline Range Organics (GRO)	1.4	0.050		mg/L	1	9/12/2016 3:31:53 PM
Surr: BFB	101	70-130		%Rec	1	9/12/2016 3:31:53 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.
D	Sample Diluted Due to Matrix
H	Holding times for preparation or analysis exceeded
ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits
S	% Recovery outside of range due to dilution or matrix
B	Analyte detected in the associated Method Blank
E	Value above quantitation range
J	Analyte detected below quantitation limits
P	Sample pH Not In Range
RL	Reporting Detection Limit
W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

27-Sep-16

Client: Western Refining Southwest, Inc.
Project: GAC 9-8-2016

Sample ID **1609433-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **Lag**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151160**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.4	0.20	2.500	0	135	73.3	174			
Surr: DNOP	0.37		0.2500		147	67.9	149			

Sample ID **1609433-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **Lag**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151161**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.4	0.20	2.500	0	136	73.3	174	0.518	20	
Surr: DNOP	0.36		0.2500		143	67.9	149	0	0	

Sample ID **LCS-27429**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **LCSW**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151162**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.3	0.20	2.500	0	131	65.4	162			
Surr: DNOP	0.35		0.2500		140	67.9	149			

Sample ID **MB-27429**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **PBW**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151163**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.72		0.5000		145	67.9	149			

Sample ID **1609433-003BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **Inlet**	Batch ID: **27464**	RunNo: **37139**							
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152316**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.8	0.20	2.500	0.6008	126	73.3	174			
Surr: DNOP	0.34		0.2500		137	67.9	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

27-Sep-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **1609433-003BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **Inlet**	Batch ID: **27464**	RunNo: **37139**
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152317** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.5	0.20	2.500	0.6008	118	73.3	174	5.98	20	
Surr: DNOP	0.33		0.2500		132	67.9	149	0	0	

Sample ID **LCS-27464**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **27464**	RunNo: **37139**
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152318** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.9	0.20	2.500	0	118	65.4	162			
Surr: DNOP	0.33		0.2500		131	67.9	149			

Sample ID **MB-27464**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **27464**	RunNo: **37139**
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152319** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.62		0.5000		125	67.9	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

27-Sep-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151445** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	94.7	70	130			
Toluene	18	1.0	20.00	0	91.9	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.4	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.2	70	130			
Surr: Toluene-d8	9.7		10.00		96.9	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151446** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		94.1	70	130			
Surr: Dibromofluoromethane	10		10.00		99.9	70	130			
Surr: Toluene-d8	9.8		10.00		97.7	70	130			

Sample ID **1609433-002ams**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lead**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151449** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.0	70	130			
Toluene	18	1.0	20.00	0	91.3	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.3	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.6		10.00		96.3	70	130			

Sample ID **1609433-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lead**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151450** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	90.8	70	130	8.67	20	
Toluene	18	1.0	20.00	0	89.8	70	130	1.66	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

27-Sep-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **1609433-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lead**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151450** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.9		10.00		98.8	70	130	0	0	
Surr: Dibromofluoromethane	9.7		10.00		97.4	70	130	0	0	
Surr: Toluene-d8	9.6		10.00		95.6	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

27-Sep-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **2.5ug gro lcs**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151489** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.52	0.050	0.5000	0	105	75.4	118			
Surr: BFB	10		10.00		103	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151490** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.10								
Surr: BFB	9.5		10.00		94.9	70	130			

Sample ID **1609433-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Lag**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151502** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.53	0.050	0.5000	0.03960	98.2	53.8	128			
Surr: BFB	9.9		10.00		98.9	70	130			

Sample ID **1609433-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Lag**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151503** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.50	0.050	0.5000	0.03960	93.0	53.8	128	4.95	20	
Surr: BFB	10		10.00		99.8	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1609433** RcptNo: **1**

Received by/date: 09/09/16

Logged By: **Ashley Gallegos** 9/9/2016 7:30:00 AM

Completed By: **Ashley Gallegos** 9/9/2016 8:36:29 AM

Reviewed By: 09/09/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.9	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard **X** Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ **Rush**_____

Project Name: **GAC**

9-8-2016

Project #:

PO#12615519

Project Manager:

Sampler: Michael A Wicker

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609433	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / ~~DRO~~ / ~~MRO~~)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015 B DRO Extented				Air Bubbles (Y or N)
9-8-16	1100	H_2O	Lag	5 - VOA	HCl	-001			x							x						
↓	↓	H_2O	Lag	1 - Amber	Cool													x				
	1110	H_2O	Lead	5 - VOA	HCl	-002			x							x						
	↓	H_2O	Lead	1 - Amber	Cool													x				
	1120	H_2O	Inlet	5 - VOA	HCl	-003			x							x						
↓	↓	H_2O	Inlet	1 - Amber	Cool													x				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9-8-16	1445			9/8/16	1445
Date:	Time:	Relinquished by:	Received by:	Date	Time
9/8/16	2100			09/09/16	0730

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 03, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC 9-8-2016 OrderNo.: 1609433

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 9/9/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued September 27, 2016.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1609433**
Date Reported: **10/3/2016**

CLIENT: Western Refining Southwest, Inc.
Project: GAC 9-8-2016
Lab ID: 1609433-001 **Matrix:** AQUEOUS

Client Sample ID: Lag
Collection Date: 9/8/2016 11:00:00 AM
Received Date: 9/9/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	9/12/2016 3:12:01 PM	27429
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	9/12/2016 3:12:01 PM	27429
Surr: DNOP	144	67.9-149		%Rec	1	9/12/2016 3:12:01 PM	27429
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	9/12/2016 12:10:12 PM	G37129
Surr: BFB	99.0	70-130		%Rec	1	9/12/2016 12:10:12 PM	G37129
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	9/12/2016 12:10:12 PM	W37129
Toluene	ND	1.0		µg/L	1	9/12/2016 12:10:12 PM	W37129
Ethylbenzene	ND	1.0		µg/L	1	9/12/2016 12:10:12 PM	W37129
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	9/12/2016 12:10:12 PM	W37129
Xylenes, Total	ND	1.5		µg/L	1	9/12/2016 12:10:12 PM	W37129
Surr: 1,2-Dichloroethane-d4	103	70-130		%Rec	1	9/12/2016 12:10:12 PM	W37129
Surr: 4-Bromofluorobenzene	98.3	70-130		%Rec	1	9/12/2016 12:10:12 PM	W37129
Surr: Dibromofluoromethane	96.4	70-130		%Rec	1	9/12/2016 12:10:12 PM	W37129
Surr: Toluene-d8	96.5	70-130		%Rec	1	9/12/2016 12:10:12 PM	W37129

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Lead
Project: GAC 9-8-2016
Collection Date: 9/5/2016 11:10:00 AM
Lab ID: 1609433-002
Matrix: AQUEOUS
Received Date: 9/9/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	9/12/2016 4:17:14 PM	27429
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	9/12/2016 4:17:14 PM	27429
Surr: DNOP	150	67.9-149	S	%Rec	1	9/12/2016 4:17:14 PM	27429
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	9/12/2016 1:36:45 PM	G37129
Surr: BFB	102	70-130		%Rec	1	9/12/2016 1:36:45 PM	G37129
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	9/12/2016 1:36:45 PM	W37129
Toluene	ND	1.0		µg/L	1	9/12/2016 1:36:45 PM	W37129
Ethylbenzene	ND	1.0		µg/L	1	9/12/2016 1:36:45 PM	W37129
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	9/12/2016 1:36:45 PM	W37129
Xylenes, Total	ND	1.5		µg/L	1	9/12/2016 1:36:45 PM	W37129
Surr: 1,2-Dichloroethane-d4	105	70-130		%Rec	1	9/12/2016 1:36:45 PM	W37129
Surr: 4-Bromofluorobenzene	99.2	70-130		%Rec	1	9/12/2016 1:36:45 PM	W37129
Surr: Dibromofluoromethane	102	70-130		%Rec	1	9/12/2016 1:36:45 PM	W37129
Surr: Toluene-d8	101	70-130		%Rec	1	9/12/2016 1:36:45 PM	W37129

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: Inlet
Project: GAC 9-8-2016
Collection Date: 9/8/2016 11:20:00 AM
Lab ID: 1609433-003
Matrix: AQUEOUS
Received Date: 9/9/2016 7:30:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	0.60	0.20		mg/L	1	9/13/2016 2:41:13 PM	27464
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	9/13/2016 2:41:13 PM	27464
Surr: DNOP	122	67.9-149		%Rec	1	9/13/2016 2:41:13 PM	27464
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **AG**	
Gasoline Range Organics (GRO)	1.4	0.050		mg/L	1	9/12/2016 3:31:53 PM	G37129
Surr: BFB	101	70-130		%Rec	1	9/12/2016 3:31:53 PM	G37129
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	9/12/2016 3:31:53 PM	W37129
Toluene	ND	1.0		µg/L	1	9/12/2016 3:31:53 PM	W37129
Ethylbenzene	21	1.0		µg/L	1	9/12/2016 3:31:53 PM	W37129
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	9/12/2016 3:31:53 PM	W37129
Xylenes, Total	8.1	1.5		µg/L	1	9/12/2016 3:31:53 PM	W37129
Surr: 1,2-Dichloroethane-d4	87.3	70-130		%Rec	1	9/12/2016 3:31:53 PM	W37129
Surr: 4-Bromofluorobenzene	60.1	70-130	S	%Rec	1	9/12/2016 3:31:53 PM	W37129
Surr: Dibromofluoromethane	84.6	70-130		%Rec	1	9/12/2016 3:31:53 PM	W37129
Surr: Toluene-d8	100	70-130		%Rec	1	9/12/2016 3:31:53 PM	W37129

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

03-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **1609433-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **Lag**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151160**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.4	0.20	2.500	0	135	73.3	174			
Surr: DNOP	0.37		0.2500		147	67.9	149			

Sample ID **1609433-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **Lag**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151161**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.4	0.20	2.500	0	136	73.3	174	0.518	20	
Surr: DNOP	0.36		0.2500		143	67.9	149	0	0	

Sample ID **LCS-27429**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **LCSW**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151162**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.3	0.20	2.500	0	131	65.4	162			
Surr: DNOP	0.35		0.2500		140	67.9	149			

Sample ID **MB-27429**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **PBW**	Batch ID: **27429**	RunNo: **37115**							
Prep Date: **9/12/2016**	Analysis Date: **9/12/2016**	SeqNo: **1151163**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.72		0.5000		145	67.9	149			

Sample ID **1609433-003BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **Inlet**	Batch ID: **27464**	RunNo: **37139**							
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152316**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.8	0.20	2.500	0.6008	126	73.3	174			
Surr: DNOP	0.34		0.2500		137	67.9	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

03-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **1609433-003BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **Inlet**	Batch ID: **27464**	RunNo: **37139**
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152317** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.5	0.20	2.500	0.6008	118	73.3	174	5.98	20	
Surr: DNOP	0.33		0.2500		132	67.9	149	0	0	

Sample ID **LCS-27464**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **27464**	RunNo: **37139**
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152318** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.9	0.20	2.500	0	118	65.4	162			
Surr: DNOP	0.33		0.2500		131	67.9	149			

Sample ID **MB-27464**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **27464**	RunNo: **37139**
Prep Date: **9/13/2016**	Analysis Date: **9/13/2016**	SeqNo: **1152319** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.62		0.5000		125	67.9	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

03-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151445** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	19	1.0	20.00	0	94.7	70	130			
Toluene	18	1.0	20.00	0	91.9	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.4	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.2	70	130			
Surr: Toluene-d8	9.7		10.00		96.9	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151446** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Methyl tert-butyl ether (MTBE)	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	10		10.00		101	70	130			
Surr: 4-Bromofluorobenzene	9.4		10.00		94.1	70	130			
Surr: Dibromofluoromethane	10		10.00		99.9	70	130			
Surr: Toluene-d8	9.8		10.00		97.7	70	130			

Sample ID **1609433-002ams**	SampType: **MS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lead**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151449** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	99.0	70	130			
Toluene	18	1.0	20.00	0	91.3	70	130			
Surr: 1,2-Dichloroethane-d4	10		10.00		104	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.3	70	130			
Surr: Dibromofluoromethane	10		10.00		102	70	130			
Surr: Toluene-d8	9.6		10.00		96.3	70	130			

Sample ID **1609433-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lead**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151450** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	18	1.0	20.00	0	90.8	70	130	8.67	20	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

03-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **1609433-002amsd**	SampType: **MSD**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **Lead**	Batch ID: **W37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151450** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Toluene	18	1.0	20.00	0	89.8	70	130	1.66	20	
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130	0	0	
Surr: 4-Bromofluorobenzene	9.9		10.00		98.8	70	130	0	0	
Surr: Dibromofluoromethane	9.7		10.00		97.4	70	130	0	0	
Surr: Toluene-d8	9.6		10.00		95.6	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1609433**

03-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC 9-8-2016

Sample ID **2.5ug gro lcs**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151489** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.52	0.050	0.5000	0	105	75.4	118			
Surr: BFB	10		10.00		103	70	130			

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151490** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.10								
Surr: BFB	9.5		10.00		94.9	70	130			

Sample ID **1609433-001ams**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Lag**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151502** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.53	0.050	0.5000	0.03960	98.2	53.8	128			
Surr: BFB	9.9		10.00		98.9	70	130			

Sample ID **1609433-001amsd**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **Lag**	Batch ID: **G37129**	RunNo: **37129**
Prep Date:	Analysis Date: **9/12/2016**	SeqNo: **1151503** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.50	0.050	0.5000	0.03960	93.0	53.8	128	4.95	20	
Surr: BFB	10		10.00		99.8	70	130	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1609433** RcptNo: **1**

Received by/date: 09/09/16

Logged By: **Ashley Gallegos** 9/9/2016 7:30:00 AM

Completed By: **Ashley Gallegos** 9/9/2016 8:36:29 AM

Reviewed By: 09/09/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	Adjusted?
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: Date

By Whom: Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.9	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard **X** Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ **Rush**_____

Project Name: **GAC**

9-8-2016

Project #:

PO#12615519

Project Manager:

Sampler: Michael A Wicker

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.9

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1609433	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / ~~DRO~~ / ~~MRO~~)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEX, MTBE only	8270 (Semi-VOA)	8015 B DRO Extented				Air Bubbles (Y or N)
9-8-16	1100	H_2O	Lag	5 - VOA	HCl	-001			x							x						
↓	↓	H_2O	Lag	1 - Amber	Cool													x				
	1110	H_2O	Lead	5 - VOA	HCl	-002			x							x						
	↓	H_2O	Lead	1 - Amber	Cool													x				
	1120	H_2O	Inlet	5 - VOA	HCl	-003			x							x						
↓	↓	H_2O	Inlet	1 - Amber	Cool													x				

Date:	Time:	Relinquished by:	Received by:	Date	Time
9-8-16	1445			9/8/16	1445
Date:	Time:	Relinquished by:	Received by:	Date	Time
9/8/16	2100			09/09/16	0730

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

October 25, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC Lead 10-11-2016 OrderNo.: 1610514

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 10/12/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC Lead
Project: GAC Lead 10-11-2016
Collection Date: 10/11/2016 2:05:00 PM
Lab ID: 1610514-001 **Matrix:** AQUEOUS **Received Date:** 10/12/2016 7:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	10/18/2016 1:23:12 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	10/18/2016 1:23:12 PM
Surr: DNOP	134	67.9-149		%Rec	1	10/18/2016 1:23:12 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	10/13/2016 11:37:53 AM
Surr: BFB	84.7	66.4-120		%Rec	1	10/13/2016 11:37:53 AM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	10/12/2016 7:15:47 PM
Toluene	ND	1.0		µg/L	1	10/12/2016 7:15:47 PM
Ethylbenzene	ND	1.0		µg/L	1	10/12/2016 7:15:47 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/12/2016 7:15:47 PM
Xylenes, Total	ND	1.5		µg/L	1	10/12/2016 7:15:47 PM
Surr: 1,2-Dichloroethane-d4	95.9	70-130		%Rec	1	10/12/2016 7:15:47 PM
Surr: 4-Bromofluorobenzene	98.0	70-130		%Rec	1	10/12/2016 7:15:47 PM
Surr: Dibromofluoromethane	96.2	70-130		%Rec	1	10/12/2016 7:15:47 PM
Surr: Toluene-d8	95.2	70-130		%Rec	1	10/12/2016 7:15:47 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC Inlet
Project: GAC Lead 10-11-2016
Collection Date: 10/11/2016 10:50:00 AM
Lab ID: 1610514-002 **Matrix:** AQUEOUS **Received Date:** 10/12/2016 7:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **JME**
Diesel Range Organics (DRO)	0.52	0.20		mg/L	1	10/18/2016 2:28:40 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	10/18/2016 2:28:40 PM
Surr: DNOP	129	67.9-149		%Rec	1	10/18/2016 2:28:40 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	0.47	0.050		mg/L	1	10/13/2016 1:15:16 PM
Surr: BFB	181	66.4-120	S	%Rec	1	10/13/2016 1:15:16 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	10/12/2016 8:12:55 PM
Toluene	ND	1.0		µg/L	1	10/12/2016 8:12:55 PM
Ethylbenzene	16	1.0		µg/L	1	10/12/2016 8:12:55 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	10/12/2016 8:12:55 PM
Xylenes, Total	6.9	1.5		µg/L	1	10/12/2016 8:12:55 PM
Surr: 1,2-Dichloroethane-d4	95.1	70-130		%Rec	1	10/12/2016 8:12:55 PM
Surr: 4-Bromofluorobenzene	102	70-130		%Rec	1	10/12/2016 8:12:55 PM
Surr: Dibromofluoromethane	90.0	70-130		%Rec	1	10/12/2016 8:12:55 PM
Surr: Toluene-d8	95.4	70-130		%Rec	1	10/12/2016 8:12:55 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610514**

25-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 10-11-2016

Sample ID **MB-28104**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **28104**	RunNo: **38002**
Prep Date: **10/17/2016**	Analysis Date: **10/18/2016**	SeqNo: **1185675** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.62		0.5000		124	67.9	149			

Sample ID **LCS-28104**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **28104**	RunNo: **38002**
Prep Date: **10/17/2016**	Analysis Date: **10/18/2016**	SeqNo: **1185676** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.3	0.20	2.500	0	130	65.4	162			
Surr: DNOP	0.29		0.2500		115	67.9	149			

Sample ID **1610514-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC Lead**	Batch ID: **28104**	RunNo: **38002**
Prep Date: **10/17/2016**	Analysis Date: **10/18/2016**	SeqNo: **1185679** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	123	73.3	174			
Surr: DNOP	0.26		0.2500		104	67.9	149			

Sample ID **1610514-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC Lead**	Batch ID: **28104**	RunNo: **38002**
Prep Date: **10/17/2016**	Analysis Date: **10/18/2016**	SeqNo: **1185680** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	123	73.3	174	0.371	20	
Surr: DNOP	0.26		0.2500		104	67.9	149	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610514**

25-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 10-11-2016

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **W37914**	RunNo: **37914**
Prep Date:	Analysis Date: **10/13/2016**	SeqNo: **1182118** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	17		20.00		86.9	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **W37914**	RunNo: **37914**
Prep Date:	Analysis Date: **10/13/2016**	SeqNo: **1182119** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.52	0.050	0.5000	0	104	80	120			
Surr: BFB	17		20.00		85.9	66.4	120			

Sample ID **1610514-001AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC Lead**	Batch ID: **W37914**	RunNo: **37914**
Prep Date:	Analysis Date: **10/13/2016**	SeqNo: **1182121** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.53	0.050	0.5000	0	105	70	130			
Surr: BFB	18		20.00		90.9	66.4	120			

Sample ID **1610514-001AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC Lead**	Batch ID: **W37914**	RunNo: **37914**
Prep Date:	Analysis Date: **10/13/2016**	SeqNo: **1182122** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.51	0.050	0.5000	0	102	70	130	3.33	20	
Surr: BFB	18		20.00		88.0	66.4	120	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1610514**

25-Oct-16

Client: Western Refining Southwest, Inc.

Project: GAC Lead 10-11-2016

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL37899**	RunNo: **37899**
Prep Date:	Analysis Date: **10/12/2016**	SeqNo: **1180619** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.7		10.00		97.0	70	130			
Surr: 4-Bromofluorobenzene	9.7		10.00		97.5	70	130			
Surr: Dibromofluoromethane	9.5		10.00		94.8	70	130			
Surr: Toluene-d8	9.7		10.00		96.5	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL37899**	RunNo: **37899**
Prep Date:	Analysis Date: **10/12/2016**	SeqNo: **1180620** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.8		10.00		97.8	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		98.5	70	130			
Surr: Dibromofluoromethane	9.7		10.00		97.2	70	130			
Surr: Toluene-d8	9.8		10.00		97.7	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1610514** RcptNo: **1**

Received by/date: 10/12/16

Logged By: **Lindsay Mangin** **10/12/2016 7:20:00 AM**

Completed By: **Lindsay Mangin** **10/12/2016 9:29:15 AM**

Reviewed By: aJ 10/12/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
6. Sample(s) in proper container(s)?	Yes ☑	No ☐	
7. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
8. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
9. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
10. VOA vials have zero headspace?	Yes ☑	No ☐	No VOA Vials ☐
11. Were any sample containers received broken?	Yes ☐	No ☑	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
13. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
14. Is it clear what analyses were requested?	Yes ☑	No ☐	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.2	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard **X** Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ **Rush**

Project Name: **GAC - Lead**

Date: 10-11-2016

Project #:

PO#12615519

Project Manager:

Kelly Robinson

Sampler: Michael A Wicker

On Ice: ☑ Yes ☐ No

Sample Temperature: 2.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1610514	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / DRO / MRO)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
10-11-16	1405	H_2O	GAC - Lead	5 VOA	HCl	-001			X							X						
↓	↓	H_2O	GAC - Lead	1-500-ml Amber	Cool	-001												X				
↓	1050	H_2O	GAC -Inlet	5 VOA	HCl	-002			X							X						
↓	↓	H_2O	GAC -Inlet	1-500-ml Amber	Cool	-002												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
10-11-16	1458		Christine Walker	10/11/16	1458
10/11/16	2017	Michael Wicker		Date	Time
				10/12/16	0720

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 11, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC-Lead 11-2-2016 OrderNo.: 1611230

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 11/3/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC-Lead 11-2-2016
Collection Date: 11/2/2016 11:10:00 AM
Lab ID: 1611230-001 **Matrix:** AQUEOUS **Received Date:** 11/3/2016 8:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	11/9/2016 3:17:36 PM	28545
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	11/9/2016 3:17:36 PM	28545
Surr: DNOP	121	67.9-149		%Rec	1	11/9/2016 3:17:36 PM	28545
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	11/8/2016 11:27:42 AM	G38528
Surr: BFB	88.4	66.4-120		%Rec	1	11/8/2016 11:27:42 AM	G38528
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	11/8/2016 9:32:38 PM	C38539
Toluene	ND	1.0		µg/L	1	11/8/2016 9:32:38 PM	C38539
Ethylbenzene	ND	1.0		µg/L	1	11/8/2016 9:32:38 PM	C38539
Xylenes, Total	ND	1.5		µg/L	1	11/8/2016 9:32:38 PM	C38539
Surr: 1,2-Dichloroethane-d4	99.9	70-130		%Rec	1	11/8/2016 9:32:38 PM	C38539
Surr: 4-Bromofluorobenzene	95.8	70-130		%Rec	1	11/8/2016 9:32:38 PM	C38539
Surr: Dibromofluoromethane	100	70-130		%Rec	1	11/8/2016 9:32:38 PM	C38539
Surr: Toluene-d8	102	70-130		%Rec	1	11/8/2016 9:32:38 PM	C38539

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC-Lead 11-2-2016
Collection Date: 11/2/2016 11:20:00 AM
Lab ID: 1611230-002 **Matrix:** AQUEOUS **Received Date:** 11/3/2016 8:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	0.49	0.20		mg/L	1	11/9/2016 4:22:23 PM	28545
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	11/9/2016 4:22:23 PM	28545
Surr: DNOP	122	67.9-149		%Rec	1	11/9/2016 4:22:23 PM	28545
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.39	0.050		mg/L	1	11/8/2016 11:52:15 AM	G38528
Surr: BFB	200	66.4-120	S	%Rec	1	11/8/2016 11:52:15 AM	G38528
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	1.5	1.0		µg/L	1	11/8/2016 10:01:16 PM	C38539
Toluene	ND	1.0		µg/L	1	11/8/2016 10:01:16 PM	C38539
Ethylbenzene	12	1.0		µg/L	1	11/8/2016 10:01:16 PM	C38539
Xylenes, Total	4.1	1.5		µg/L	1	11/8/2016 10:01:16 PM	C38539
Surr: 1,2-Dichloroethane-d4	87.7	70-130		%Rec	1	11/8/2016 10:01:16 PM	C38539
Surr: 4-Bromofluorobenzene	90.7	70-130		%Rec	1	11/8/2016 10:01:16 PM	C38539
Surr: Dibromofluoromethane	87.5	70-130		%Rec	1	11/8/2016 10:01:16 PM	C38539
Surr: Toluene-d8	100	70-130		%Rec	1	11/8/2016 10:01:16 PM	C38539

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1611230**

11-Nov-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 11-2-2016

Sample ID **LCS-28545**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **LCSW**	Batch ID: **28545**	RunNo: **38562**							
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1204867**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.5	0.20	2.500	0	101	72	170			
Surr: DNOP	0.28		0.2500		111	67.9	149			

Sample ID **MB-28545**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **PBW**	Batch ID: **28545**	RunNo: **38562**							
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1204868**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.61		0.5000		122	67.9	149			

Sample ID **1611230-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **GAC-Lead**	Batch ID: **28545**	RunNo: **38562**							
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1205312**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.6	0.20	2.500	0	104	75.4	162			
Surr: DNOP	0.28		0.2500		114	67.9	149			

Sample ID **1611230-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**							
Client ID: **GAC-Lead**	Batch ID: **28545**	RunNo: **38562**							
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1205313**	Units: **mg/L**						
Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.6	0.20	2.500	0	104	75.4	162	0.0154	20	
Surr: DNOP	0.29		0.2500		115	67.9	149	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1611230**

11-Nov-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 11-2-2016

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G38528**	RunNo: **38528**
Prep Date:	Analysis Date: **11/8/2016**	SeqNo: **1203934** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		88.7	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G38528**	RunNo: **38528**
Prep Date:	Analysis Date: **11/8/2016**	SeqNo: **1203935** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.46	0.050	0.5000	0	91.9	80	120			
Surr: BFB	19		20.00		93.3	66.4	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1611230**

11-Nov-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 11-2-2016

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **C38539**	RunNo: **38539**
Prep Date:	Analysis Date: **11/8/2016**	SeqNo: **1204485** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	20	1.0	20.00	0	101	70	130			
Toluene	21	1.0	20.00	0	103	70	130			
Surr: 1,2-Dichloroethane-d4	9.6		10.00		95.7	70	130			
Surr: 4-Bromofluorobenzene	9.1		10.00		90.9	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.8	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID **rb3**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **C38539**	RunNo: **38539**
Prep Date:	Analysis Date: **11/9/2016**	SeqNo: **1204486** Units: **µg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	1.0								
Toluene	ND	1.0								
Ethylbenzene	ND	1.0								
Xylenes, Total	ND	1.5								
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.8	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.2	70	130			
Surr: Dibromofluoromethane	11		10.00		108	70	130			
Surr: Toluene-d8	10		10.00		99.7	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1611230** RcptNo: **1**

Received by/date: AG 11/03/2016

Logged By: **Ashley Gallegos** **11/3/2016 8:20:00 AM** AG

Completed By: **Ashley Gallegos** **11/4/2016 9:37:41 AM** AG

Reviewed By: AG | aJ 11/04/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes	No	Not Present ✔
2. Is Chain of Custody complete?	Yes ✔	No	Not Present
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ✔	No	NA
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✔	No	NA
6. Sample(s) in proper container(s)?	Yes ✔	No	
7. Sufficient sample volume for indicated test(s)?	Yes ✔	No	
8. Are samples (except VOA and ONG) properly preserved?	Yes ✔	No	
9. Was preservative added to bottles?	Yes	No ✔	NA
10. VOA vials have zero headspace?	Yes ✔	No	No VOA Vials
11. Were any sample containers received broken?	Yes	No ✔	# of preserved bottles checked for pH:
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✔	No	(<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ✔	No	Adjusted?
14. Is it clear what analyses were requested?	Yes ✔	No	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✔	No	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes No NA ✔

Person Notified: Date

By Whom: Via: eMail Phone Fax In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.2	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush _____

Project Name: **GAC - Lead**

Date: 11-2-2016

Project #:

PO#12615519

Project Manager:

Sampler: Michael A Wicker

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1611230	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / ~~DRO / MRO~~)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
11-2-16	1110	H_2O	GAC - Lead	5 VOA	HCl	-001			X							X						
↓	↓	H_2O	GAC - Lead	1-500-ml Amber	Cool	-001												X				
↓	1120	H_2O	GAC -Inlet	5 VOA	HCl	-002			X							X						
↓	↓	H_2O	GAC -Inlet	1-500-ml Amber	Cool	-003												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
11-2-16	1625			11/2/18	1625
11/2/18	1843		Lindsey Cordova	11/03/16	0820

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

November 15, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC-Lead 11-2-2016 OrderNo.: 1611230

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 2 sample(s) on 11/3/2016 for the analyses presented in the following report.

This report is a revised report and it replaces the original report issued November 11, 2016.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. All samples are reported as received unless otherwise indicated.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman

Laboratory Manager

4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC-Lead 11-2-2016
Collection Date: 11/2/2016 11:10:00 AM
Lab ID: 1611230-001 **Matrix:** AQUEOUS **Received Date:** 11/3/2016 8:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	11/9/2016 3:17:36 PM	28545
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	11/9/2016 3:17:36 PM	28545
Surr: DNOP	121	67.9-149		%Rec	1	11/9/2016 3:17:36 PM	28545
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	11/8/2016 11:27:42 AM	G38528
Surr: BFB	88.4	66.4-120		%Rec	1	11/8/2016 11:27:42 AM	G38528
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	ND	1.0		µg/L	1	11/8/2016 9:32:38 PM	R38539
Toluene	ND	1.0		µg/L	1	11/8/2016 9:32:38 PM	R38539
Ethylbenzene	ND	1.0		µg/L	1	11/8/2016 9:32:38 PM	R38539
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	11/8/2016 9:32:38 PM	R38539
Xylenes, Total	ND	1.5		µg/L	1	11/8/2016 9:32:38 PM	R38539
Surr: 1,2-Dichloroethane-d4	99.9	70-130		%Rec	1	11/8/2016 9:32:38 PM	R38539
Surr: 4-Bromofluorobenzene	95.8	70-130		%Rec	1	11/8/2016 9:32:38 PM	R38539
Surr: Dibromofluoromethane	100	70-130		%Rec	1	11/8/2016 9:32:38 PM	R38539
Surr: Toluene-d8	102	70-130		%Rec	1	11/8/2016 9:32:38 PM	R38539

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
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Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC-Lead 11-2-2016
Collection Date: 11/2/2016 11:20:00 AM
Lab ID: 1611230-002
Matrix: AQUEOUS
Received Date: 11/3/2016 8:20:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed	Batch
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**	
Diesel Range Organics (DRO)	0.49	0.20		mg/L	1	11/9/2016 4:22:23 PM	28545
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	11/9/2016 4:22:23 PM	28545
Surr: DNOP	122	67.9-149		%Rec	1	11/9/2016 4:22:23 PM	28545
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**	
Gasoline Range Organics (GRO)	0.39	0.050		mg/L	1	11/8/2016 11:52:15 AM	G38528
Surr: BFB	200	66.4-120	S	%Rec	1	11/8/2016 11:52:15 AM	G38528
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **AG**	
Benzene	1.5	1.0		µg/L	1	11/8/2016 10:01:16 PM	R38539
Toluene	ND	1.0		µg/L	1	11/8/2016 10:01:16 PM	R38539
Ethylbenzene	12	1.0		µg/L	1	11/8/2016 10:01:16 PM	R38539
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	11/8/2016 10:01:16 PM	R38539
Xylenes, Total	4.1	1.5		µg/L	1	11/8/2016 10:01:16 PM	R38539
Surr: 1,2-Dichloroethane-d4	87.7	70-130		%Rec	1	11/8/2016 10:01:16 PM	R38539
Surr: 4-Bromofluorobenzene	90.7	70-130		%Rec	1	11/8/2016 10:01:16 PM	R38539
Surr: Dibromofluoromethane	87.5	70-130		%Rec	1	11/8/2016 10:01:16 PM	R38539
Surr: Toluene-d8	100	70-130		%Rec	1	11/8/2016 10:01:16 PM	R38539

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1611230**

15-Nov-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 11-2-2016

Sample ID **LCS-28545**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **28545**	RunNo: **38562**
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1204867** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.5	0.20	2.500	0	101	72	170			
Surr: DNOP	0.28		0.2500		111	67.9	149			

Sample ID **MB-28545**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **28545**	RunNo: **38562**
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1204868** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.61		0.5000		122	67.9	149			

Sample ID **1611230-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **28545**	RunNo: **38562**
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1205312** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.6	0.20	2.500	0	104	75.4	162			
Surr: DNOP	0.28		0.2500		114	67.9	149			

Sample ID **1611230-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **28545**	RunNo: **38562**
Prep Date: **11/8/2016**	Analysis Date: **11/9/2016**	SeqNo: **1205313** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	2.6	0.20	2.500	0	104	75.4	162	0.0154	20	
Surr: DNOP	0.29		0.2500		115	67.9	149	0	0	

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1611230**

15-Nov-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 11-2-2016

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G38528**	RunNo: **38528**
Prep Date:	Analysis Date: **11/8/2016**	SeqNo: **1203934** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	18		20.00		88.7	66.4	120			

Sample ID **2.5UG GRO LCS**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G38528**	RunNo: **38528**
Prep Date:	Analysis Date: **11/8/2016**	SeqNo: **1203935** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.46	0.050	0.5000	0	91.9	80	120			
Surr: BFB	19		20.00		93.3	66.4	120			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1611230**

15-Nov-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 11-2-2016

Sample ID **100ng lcs2**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **C38539**	RunNo: **38539**
Prep Date:	Analysis Date: **11/8/2016**	SeqNo: **1204485** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.6		10.00		95.7	70	130			
Surr: 4-Bromofluorobenzene	9.1		10.00		90.9	70	130			
Surr: Dibromofluoromethane	9.8		10.00		97.8	70	130			
Surr: Toluene-d8	10		10.00		104	70	130			

Sample ID **rb3**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **C38539**	RunNo: **38539**
Prep Date:	Analysis Date: **11/9/2016**	SeqNo: **1204486** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.9		10.00		98.8	70	130			
Surr: 4-Bromofluorobenzene	9.9		10.00		99.2	70	130			
Surr: Dibromofluoromethane	11		10.00		108	70	130			
Surr: Toluene-d8	10		10.00		99.7	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1611230** RcptNo: **1**

Received by/date: AG 11/03/2016

Logged By: **Ashley Gallegos** **11/3/2016 8:20:00 AM** AG

Completed By: **Ashley Gallegos** **11/4/2016 9:37:41 AM** AG

Reviewed By: AG | aJ 11/04/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes	No	Not Present ✔
2. Is Chain of Custody complete?	Yes ✔	No	Not Present
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ✔	No	NA
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✔	No	NA
6. Sample(s) in proper container(s)?	Yes ✔	No	
7. Sufficient sample volume for indicated test(s)?	Yes ✔	No	
8. Are samples (except VOA and ONG) properly preserved?	Yes ✔	No	
9. Was preservative added to bottles?	Yes	No ✔	NA
10. VOA vials have zero headspace?	Yes ✔	No	No VOA Vials
11. Were any sample containers received broken?	Yes	No ✔	# of preserved bottles checked for pH:
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✔	No	(<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ✔	No	Adjusted?
14. Is it clear what analyses were requested?	Yes ✔	No	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✔	No	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes No NA ✔

Person Notified: Date

By Whom: Via: eMail Phone Fax In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.2	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**

Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:

☐ Standard X Level 4 (Full Validation)

☐ Other _____

X EDD (Type) _____

Turn-Around Time:

X Standard ☐ Rush _____

Project Name: **GAC - Lead**

Date: 11-2-2016

Project #:

PO#12615519

Project Manager:

Sampler: Michael A Wicker

On Ice: ☒ Yes ☐ No

Sample Temperature: 3.2

HALL ENVIRONMENTAL ANALYSIS LABORATORY

www.hallenvironmental.com

4901 Hawkins NE - Albuquerque, NM 87109

Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1611230	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / ~~DRO / MRO~~)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
11-2-16	1110	H_2O	GAC - Lead	5 VOA	HCl	-001			X							X						
↓	↓	H_2O	GAC - Lead	1-500-ml Amber	Cool	-001												X				
↓	1120	H_2O	GAC -Inlet	5 VOA	HCl	-002			X							X						
↓	↓	H_2O	GAC -Inlet	1-500-ml Amber	Cool	-003												X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
11-2-16	1625			11/2/18	1625
11/2/18	1843		Lindsey Cordova	11/03/16	0820

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

December 09, 2016

Kelly Robinson

Western Refining Southwest, Inc.
#50 CR 4990
Bloomfield, NM 87413
TEL: (505) 632-4135
FAX

RE: GAC-Lead 12-01-2016 OrderNo.: 1612065

Dear Kelly Robinson:

Hall Environmental Analysis Laboratory received 3 sample(s) on 12/2/2016 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent. To access our accredited tests please go to www.hallenvironmental.com or the state specific web sites. In order to properly interpret your results it is imperative that you review this report in its entirety. See the sample checklist and/or the Chain of Custody for information regarding the sample receipt temperature and preservation. Data qualifiers or a narrative will be provided if the sample analysis or analytical quality control parameters require a flag. When necessary, data qualifers are provided on both the sample analysis report and the QC summary report, both sections should be reviewed. All samples are reported, as received, unless otherwise indicated. Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH and residual chlorine are qualified as being analyzed outside of the recommended holding time.

Please don't hesitate to contact HEAL for any additional information or clarifications.

ADHS Cert #AZ0682 -- NMED-DWB Cert #NM9425 -- NMED-Micro Cert #NM0190

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

Analytical Report
Lab Order **1612065**
Date Reported: **12/9/2016**

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lead
Project: GAC-Lead 12-01-2016
Collection Date: 12/1/2016 12:20:00 PM
Lab ID: 1612065-001 **Matrix:** AQUEOUS **Received Date:** 12/2/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	12/8/2016 1:34:54 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	12/8/2016 1:34:54 PM
Surr: DNOP	126	67.9-149		%Rec	1	12/8/2016 1:34:54 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	12/5/2016 2:22:18 PM
Surr: BFB	85.8	66.4-120		%Rec	1	12/5/2016 2:22:18 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	12/5/2016 3:03:44 PM
Toluene	ND	1.0		µg/L	1	12/5/2016 3:03:44 PM
Ethylbenzene	ND	1.0		µg/L	1	12/5/2016 3:03:44 PM
Methyl tert-butyl ether (MTBE)	1.2	1.0		µg/L	1	12/5/2016 3:03:44 PM
Xylenes, Total	ND	1.5		µg/L	1	12/5/2016 3:03:44 PM
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	12/5/2016 3:03:44 PM
Surr: 4-Bromofluorobenzene	89.8	70-130		%Rec	1	12/5/2016 3:03:44 PM
Surr: Dibromofluoromethane	108	70-130		%Rec	1	12/5/2016 3:03:44 PM
Surr: Toluene-d8	95.3	70-130		%Rec	1	12/5/2016 3:03:44 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Inlet
Project: GAC-Lead 12-01-2016
Collection Date: 12/1/2016 12:10:00 PM
Lab ID: 1612065-002
Matrix: AQUEOUS
Received Date: 12/2/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	0.75	0.20		mg/L	1	12/8/2016 2:56:48 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	12/8/2016 2:56:48 PM
Surr: DNOP	124	67.9-149		%Rec	1	12/8/2016 2:56:48 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	1.1	0.25		mg/L	5	12/5/2016 2:47:09 PM
Surr: BFB	121	66.4-120	S	%Rec	5	12/5/2016 2:47:09 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	12/5/2016 4:30:21 PM
Toluene	ND	1.0		µg/L	1	12/5/2016 4:30:21 PM
Ethylbenzene	30	1.0		µg/L	1	12/5/2016 4:30:21 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	12/5/2016 4:30:21 PM
Xylenes, Total	46	1.5		µg/L	1	12/5/2016 4:30:21 PM
Surr: 1,2-Dichloroethane-d4	107	70-130		%Rec	1	12/5/2016 4:30:21 PM
Surr: 4-Bromofluorobenzene	96.1	70-130		%Rec	1	12/5/2016 4:30:21 PM
Surr: Dibromofluoromethane	106	70-130		%Rec	1	12/5/2016 4:30:21 PM
Surr: Toluene-d8	94.2	70-130		%Rec	1	12/5/2016 4:30:21 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Western Refining Southwest, Inc.
Client Sample ID: GAC-Lag
Project: GAC-Lead 12-01-2016
Collection Date: 12/1/2016 2:10:00 PM
Lab ID: 1612065-003 **Matrix:** AQUEOUS **Received Date:** 12/2/2016 8:00:00 AM

Analyses	Result	PQL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015D: DIESEL RANGE						Analyst: **TOM**
Diesel Range Organics (DRO)	ND	0.20		mg/L	1	12/8/2016 3:23:52 PM
Motor Oil Range Organics (MRO)	ND	2.5		mg/L	1	12/8/2016 3:23:52 PM
Surr: DNOP	130	67.9-149		%Rec	1	12/8/2016 3:23:52 PM
EPA METHOD 8015D: GASOLINE RANGE						Analyst: **NSB**
Gasoline Range Organics (GRO)	ND	0.050		mg/L	1	12/5/2016 4:26:41 PM
Surr: BFB	87.4	66.4-120		%Rec	1	12/5/2016 4:26:41 PM
EPA METHOD 8260: VOLATILES SHORT LIST						Analyst: **DJF**
Benzene	ND	1.0		µg/L	1	12/5/2016 3:32:39 PM
Toluene	ND	1.0		µg/L	1	12/5/2016 3:32:39 PM
Ethylbenzene	ND	1.0		µg/L	1	12/5/2016 3:32:39 PM
Methyl tert-butyl ether (MTBE)	ND	1.0		µg/L	1	12/5/2016 3:32:39 PM
Xylenes, Total	ND	1.5		µg/L	1	12/5/2016 3:32:39 PM
Surr: 1,2-Dichloroethane-d4	109	70-130		%Rec	1	12/5/2016 3:32:39 PM
Surr: 4-Bromofluorobenzene	84.5	70-130		%Rec	1	12/5/2016 3:32:39 PM
Surr: Dibromofluoromethane	109	70-130		%Rec	1	12/5/2016 3:32:39 PM
Surr: Toluene-d8	92.6	70-130		%Rec	1	12/5/2016 3:32:39 PM

Refer to the QC Summary report and sample login checklist for flagged QC data and preservation information.

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1612065**

09-Dec-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 12-01-2016

Sample ID **1612065-001BMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **29056**	RunNo: **39239**
Prep Date: **12/7/2016**	Analysis Date: **12/8/2016**	SeqNo: **1228602** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.1	0.20	2.500	0	125	75.4	162			
Surr: DNOP	0.27		0.2500		109	67.9	149			

Sample ID **1612065-001BMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **GAC-Lead**	Batch ID: **29056**	RunNo: **39239**
Prep Date: **12/7/2016**	Analysis Date: **12/8/2016**	SeqNo: **1228603** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0	128	75.4	162	2.96	20	
Surr: DNOP	0.26		0.2500		106	67.9	149	0	0	

Sample ID **LCS-29056**	SampType: **LCS**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **LCSW**	Batch ID: **29056**	RunNo: **39239**
Prep Date: **12/7/2016**	Analysis Date: **12/8/2016**	SeqNo: **1228606** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	3.2	0.20	2.500	0	128	72	170			
Surr: DNOP	0.26		0.2500		104	67.9	149			

Sample ID **MB-29056**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Diesel Range**
Client ID: **PBW**	Batch ID: **29056**	RunNo: **39239**
Prep Date: **12/7/2016**	Analysis Date: **12/8/2016**	SeqNo: **1228607** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	0.20								
Motor Oil Range Organics (MRO)	ND	2.5								
Surr: DNOP	0.59		0.5000		119	67.9	149			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1612065**

09-Dec-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 12-01-2016

Sample ID **RB**	SampType: **MBLK**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **PBW**	Batch ID: **G39141**	RunNo: **39141**
Prep Date:	Analysis Date: **12/5/2016**	SeqNo: **1224983** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	0.050								
Surr: BFB	17		20.00		86.7	66.4	120			

Sample ID **2.5UG GRO LCSB**	SampType: **LCS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **LCSW**	Batch ID: **G39141**	RunNo: **39141**
Prep Date:	Analysis Date: **12/5/2016**	SeqNo: **1224984** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	0.43	0.050	0.5000	0	85.8	79.1	123			
Surr: BFB	19		20.00		93.0	66.4	120			

Sample ID **1612065-002AMS**	SampType: **MS**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Inlet**	Batch ID: **G39141**	RunNo: **39141**
Prep Date:	Analysis Date: **12/5/2016**	SeqNo: **1224996** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	3.2	0.25	2.500	1.059	84.2	64.8	129			
Surr: BFB	140		100.0		139	66.4	120			S

Sample ID **1612065-002AMSD**	SampType: **MSD**	TestCode: **EPA Method 8015D: Gasoline Range**
Client ID: **GAC-Inlet**	Batch ID: **G39141**	RunNo: **39141**
Prep Date:	Analysis Date: **12/5/2016**	SeqNo: **1224997** Units: **mg/L**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	3.4	0.25	2.500	1.059	92.1	64.8	129	6.07	20	
Surr: BFB	140		100.0		136	66.4	120	0	0	S

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1612065**

09-Dec-16

Client: Western Refining Southwest, Inc.

Project: GAC-Lead 12-01-2016

Sample ID **rb**	SampType: **MBLK**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **PBW**	Batch ID: **SL39159**	RunNo: **39159**
Prep Date:	Analysis Date: **12/5/2016**	SeqNo: **1225147** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	10		10.00		100	70	130			
Surr: 4-Bromofluorobenzene	9.3		10.00		93.2	70	130			
Surr: Dibromofluoromethane	10		10.00		104	70	130			
Surr: Toluene-d8	9.8		10.00		97.6	70	130			

Sample ID **100ng lcs**	SampType: **LCS**	TestCode: **EPA Method 8260: Volatiles Short List**
Client ID: **LCSW**	Batch ID: **SL39159**	RunNo: **39159**
Prep Date:	Analysis Date: **12/5/2016**	SeqNo: **1225148** Units: **%Rec**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Surr: 1,2-Dichloroethane-d4	9.4		10.00		94.4	70	130			
Surr: 4-Bromofluorobenzene	9.5		10.00		94.9	70	130			
Surr: Dibromofluoromethane	9.5		10.00		95.4	70	130			
Surr: Toluene-d8	9.8		10.00		97.8	70	130			

Qualifiers:

*	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
D	Sample Diluted Due to Matrix	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	P	Sample pH Not In Range
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	% Recovery outside of range due to dilution or matrix	W	Sample container temperature is out of limit as specified

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name: **Western Refining Southw** Work Order Number: **1612065** RcptNo: 1

Received by/date: AG 12/02/16

Logged By: **Ashley Gallegos** **12/2/2016 8:00:00 AM** AG

Completed By: **Ashley Gallegos** **12/2/2016 9:34:06 AM** AG

Reviewed By: IO 12/02/16

Chain of Custody

1. Custody seals intact on sample bottles?	Yes	No	Not Present ✔
2. Is Chain of Custody complete?	Yes ✔	No	Not Present
3. How was the sample delivered?	Courier		

Log In

4. Was an attempt made to cool the samples?	Yes ✔	No	NA
5. Were all samples received at a temperature of >0° C to 6.0°C	Yes ✔	No	NA
6. Sample(s) in proper container(s)?	Yes ✔	No	
7. Sufficient sample volume for indicated test(s)?	Yes ✔	No	
8. Are samples (except VOA and ONG) properly preserved?	Yes ✔	No	
9. Was preservative added to bottles?	Yes	No ✔	NA
10. VOA vials have zero headspace?	Yes ✔	No	No VOA Vials
11. Were any sample containers received broken?	Yes	No ✔	
12. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ✔	No	# of preserved bottles checked for pH: (<2 or >12 unless noted)
13. Are matrices correctly identified on Chain of Custody?	Yes ✔	No	Adjusted?
14. Is it clear what analyses were requested?	Yes ✔	No	
15. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ✔	No	Checked by:

Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes No NA ✔

Person Notified: Date

By Whom: Via: eMail Phone Fax In Person

Regarding:

Client Instructions:

17. Additional remarks:

18. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	2.4	Good	Yes			

Chain-of-Custody Record

Client: **Western Refining**

Mailing Address: **#50 CR 4990**
Bloomfield, NM 87413

Phone #: **505-632-4135**

email or Fax#:

QA/QC Package:
☐ Standard X Level 4 (Full Validation)
☐ Other
X EDD (Type)

Turn-Around Time:
X Standard ☐ Rush

Project Name: **GAC - Lead**

Date: 12-01-2016

Project #:
PO#12615519

Project Manager:
Kelly Robinson

Sampler: Michael A Wicker

On Ice: ☑ Yes ☐ No

Sample Temperature: 2.4°C

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Analysis Request

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1612065	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH 8015B (GRO / ~~DRO~~ / ~~MRO~~)	TPH (Method 418.1)	EDB (Method 504.1)	PAH (8310 or 8270SIMS)	RCRA 8 Metals	Anions (F,Cl,NO_3,NO_2,PO_4,SO_4)	8081 Pesticides / 8082 PCB's	8260B (VOA) BTEx, MTBE only	8270 (Semi-VOA)	8015B DRO Extended				Air Bubbles (Y or N)
12/1/16	1220	H_2O	GAC - Lead	5 VOA	HCl	-001			x							x						
↓	↓	H_2O	GAC - Lead	1-500-ml Amber	Cool													x				
↓	1210	H_2O	GAC -Inlet	5 VOA	HCl	-002			x							x						
↓	↓	H_2O	GAC -Inlet	1-500-ml Amber	Cool													x				
↓	1410	H_2O	GAC-Lag	5 VOA	HCl	-003			X							X						
↓	↓	H_2O	GAC-Lag	1-500ml	Cool													X				

Date:	Time:	Relinquished by:	Received by:	Date	Time
12/1/16	1600		Michael Wicker	12/1/16	1600
12/1/16	1810	Martha Walker		12/02/16	0800

Remarks:

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.