FINAL REPORT

In Situ Bioremediation of Perchlorate in Vadose Zone Source Areas

ESTCP Project ER-200435

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Acronyms and Abbreviations

Aerojet	Aerojet General, Rancho Cordova, CA
AFB	Air Force Base
Ag	Silver
As	Arsenic
Ba	Barium
Old Bldg D1	Building D; site evaluated at Tronox
Bgs	Below Ground Surface
Cd	Cadmium
Cm	Centimeter
CO_2	Carbon Dioxide
Cr	Chromium
CSTR	Continuous Stirred Tank Reactor
DAP	Diammonium Phosphate
DoD	Department of Defense
DWEL	Drinking Water Equivalent Level
Edwards	Edwards Air Force Base, Edwards, CA
EPA/USEPA	United States Environmental Protection Agency
ESTCP	Environmental Security Technology Certification Program
Ft	Feet
g	Grams
Hg	Mercury
hr	hours
ITRC	Interstate Technology & Regulatory Council
kg	kilogram
L	Liter
LHAAP	Longhorn Army Ammunition Plant, Karnack, TX
µg	Micrograms
M	Meters
MADEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
mg	Milligrams
mL	Milliliters
mm	Millimeter
mM	Millimolar
N_2	Nitrogen gas
NFESC	Naval Facilities Engineering Service Center
NH_4ClO_4	Ammonium Perchlorate
NMED	New Mexico Environmental Department
NSWC-IHDIV	Naval Surface Warfare Center Indian Head Division, MD

O_2	Oxygen
ORP	Oxidation-Reduction Potential
Pb	Lead
PI	Principal Investigator
ppb	Parts Per Billion
PQL	Practical Quantitation Limit
PRB	Perchlorate-Reducing Bacteria
QA	Quality Assurance
RCRA	Resource Conservation Recovery Act
RfD	Reference Dose
RI	Remedial Investigation
RPM	Revolutions per Minute
Se	Selenium
SERDP	Strategic Environmental Research and Development Program
SW-846	EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods
TOC	Total Organic Carbon
Tronox	Tronox, LLC, Henderson, NV
USCS	Unified Soil Classification System
USGS	United States Geological Survey
WHC	Soil Water Holding Capacity
VOCs	Volatile Organic Compounds

Executive Summary

This summary report details the results of site assessment work and treatability studies conducted to support a field trial of two separate i*n situ* treatment approaches for perchlorate in deep vadose soils. Due to difficulties in finding a suitable site for this project in a timely manner, the field demonstration was not executed. This report provides (1) two field approaches for applying substrates to promote perchlorate biodegradation to unsaturated soils; (2) results from the field assessment of vadose-zone perchlorate at two sites; and (3) data from a laboratory microcosm study of the most effective substrates to stimulate perchlorate and nitrate biodegradation in a perchlorate-containing deep vadose soil at the Tronox site in Henderson, NV.

The primary objective of this project was to demonstrate and validate the treatment of perchlorate within vadose zone soils through bioremediation and flushing via two electron donor delivery methods: Treatment #1, the infiltration of liquid electron donor using an engineered infiltration gallery; and Treatment #2, the addition of a electron donor source to the upper soil column and periodic watering to promote vertical distribution within the vadose zone (see Figures 1.1 and 1.2). For Treatment #1, an engineered infiltration gallery was to be designed to effectively deliver and distribute the electron donor to the perchlorate-impacted vadose soils. For Treatment #2, a complex electron donor source such as emulsified vegetable oil or cow manure was to be mixed into the upper meter of the soil, and an automated sprinkling system designed to supply water over the test plot area and promote vertical penetration of the electron donor agent along with the infiltrating waters.

During the site selection process, a total of six soil borings were advanced at the Tronox site in Henderson, Nevada. The lithology (moderate to highly permeable alluvial sands and gravel with some silts (Quaternary Alluvium (Qal)), vadose zone thickness (approximately 30 to 35 feet), and perchlorate concentrations and distribution (impacts were found in each 5 ft soil interval from ground surface to the water table interface at concentrations ranging from 2.09 mg/kg up to 6,900 mg/kg) indicated that several locations at the Tronox site were suitable for conducting the proposed studies.

The results from the laboratory microcosm study showed that three liquid amendments (emulsified vegetable oil substrate [EOS], ethanol, and citrate) were effective for promoting biological degradation of nitrate and perchlorate in unsaturated soils (~ 75 – 85 % of water holding capacity; WHC). Among these amendments, EOS resulted in the fastest and most consistent biodegradation of the target anions. Perchlorate concentrations in the EOS-treated samples declined from > 1,400 mg/kg to < 0.3 mg/kg in 18 weeks. Several solid (or solid/liquid combination) amendments also were effective for stimulating perchlorate biodegradation in the vadose soils, including soybean oil with peat moss, bioreactor sludge with acetate, and cheese

whey. Among these substrates, the former two mixtures resulted in the most rapid and consistent perchlorate biodegradation. Based on the laboratory results, EOS is likely to be the most effective substrate for promoting perchlorate biodegradation in an infiltration gallery design (Treatment #1) in which the amendment is diluted with water and percolated through the formation, and a mixture of soybean oil and peat moss is suggested in the surface amendment design (Treatment # 2) in which the substrate is mixed into the soil surface, which is them watered to promote distribution of the carbon to deeper regions of the soil.

One of the difficulties with unsaturated soils is the inherent heterogeneity compared to other sample matrices (i.e., groundwater or headspace), and this heterogeneity can lead to large variability, which was observed for some treatments in the laboratory study. The high concentrations of perchlorate in the vadose soils (> 1,400 mg/kg on average), and the possibility that some of this material was present as precipitate, probably contributed to this variability. However, despite the soil heterogeneity and high contaminant concentrations, the laboratory studies suggest that, if amendments can be well distributed in the vadose soil matrix, bioremediation of perchlorate from > 1,400 mg/kg to < 1 mg/kg is feasible. The field component of this project at Tronox was cancelled due to scheduling and other issues, but the laboratory studies completed to support this effort suggest that perchlorate treatment in the deep vadose soils is feasible if amendment distribution can be achieved.

1.0 Introduction

1.1 Background

Ammonium perchlorate (NH_4ClO_4) has been used for several decades in the United States as an oxidizer in solid propellants and explosives. This compound and other perchlorate salts are also present in various commercial products, such as fireworks, safety flares and matches. Discharges during the manufacture of perchlorate salts and from the periodic replacement of outdated solid fuels in military missiles and rockets have resulted in substantial perchlorate contamination in soils and groundwater in several states, including California, Texas, Utah, Maryland and Nevada (Damian and Pontius, 1999; Hatzinger, 2005). Although there is no federal drinking water standard (Maximum Contaminant Level; MCL) for perchlorate, the United States Environmental Protection Agency has issued a reference dose (RfD) of 0.7 µg perchlorate/kg body wt/day, which corresponds to a drinking water equivalent level (DWEL) of ~ 24.5 µg/L (USEPA, 2005). In addition, California has established a state MCL of 6 µg/L and Massachusetts has set a drinking water MCL of 2 µg/L (MADEP, 2008). Several other states, including Nevada, Maryland, New York and Texas have also instituted advisory levels for the oxidant (ITRC, 2008).

Biological treatment has been successfully applied for *ex situ* remediation of perchlorate in groundwater beginning in 1998, and *in situ* applications are rapidly emerging. During the past decade, a variety of microbial strains have been isolated with the ability to degrade perchlorate by using the molecule as a terminal electron acceptor (Coates and Achenbach, 2004; Coates et al., 1999; Rikken et al., 1996; Wallace et al., 1996; Logan, 1998; Wu et al., 2001). In general, these perchlorate-reducing bacteria (PRB) are facultative anaerobes, capable of utilizing oxygen, nitrate, and perchlorate as electron acceptors (Coates and Achenbach, 2004). Research suggests that these organisms are naturally-occurring in many environments, including groundwater aquifers, sludges, and raw wastewater, as well as in soils (Coates and Achenbach, 2004; Coates et al., 1999; Wu et al., 2001; Waller et al., 2004). Such strains have been successfully utilized in *ex situ* fluidized bed reactor systems to treat perchlorate-contaminated groundwater at five sites, including the Longhorn Army Ammunition Plant (Karnack, TX), Aerojet Corporation (Rancho Cordova, CA), Tronox LLC (formerly Kerr-McGee Corp production facility; Henderson, NV), and Jet Propulsion Labs (Pasadena, CA) (Hatzinger, 2005; McCarty and Meyer, 2005). Continuous Stirred-Tank Reactors (CSTRs) have also been successfully applied to biologically treat high concentrations of perchlorate in wastewater (Hatzinger, 2005).

Various *in situ* bioremediation approaches for perchlorate in groundwater have also been examined at the laboratory and the field scale, and two different full-scale systems have been installed at the former PEPCON facility in Henderson, NV and the Naval Weapons Industrial

Reserve Plant, McGregor, TX, respectively (ITRC, 2008; Hatzinger, 2005). For *in situ* treatment, one of several different organic substrates is added to perchlorate-contaminated water, either via passive injection, through installation of a trench, or through a recirculation system (Stroo and Ward, 2008). These substrates are then utilized by indigenous bacteria as an electron donor and carbon source during perchlorate biodegradation.

While there has been a significant effort to develop practical remediation technologies for perchlorate in groundwater, there has been little consideration of perchlorate treatment in unsaturated soils, particularly in deep vadose zone soils that overly many groundwater perchlorate plumes. Residual perchlorate contamination within vadose zone soils in source areas such as hog out operations, open-burn, open-detonation areas, live fire ranges, and ammonium perchlorate production and fine grinding facilities continues to pose an ongoing threat to groundwater. Previous laboratory and field research has demonstrated success with treatment of perchlorate-laden surface soils by addition of manure, composting, or in large agricultural bags (e.g., ITRC, 2008; Evans et al., 2008). Phytoremediation has also been tested for soil treatment (ITRC, 2008). However, these approaches may not be cost effective or feasible for sites with deep groundwater and high levels of residual perchlorate contamination within vadose zone soils in source areas. Table 1.1 identifies some sites with potentially thick layers of vadose zone soils impacted with perchlorate. Due to the high solubility of perchlorate, these impacted soils will continue to act as a source of continuing contamination to underlying groundwater aquifers (Newman et al., 2005; ITRC, 2008). This ongoing source will increase the operating timeframe and associated costs for hydraulic containment (pump and treatment) and *in situ* groundwater treatment systems.

The goal of this ESTCP project was to build upon previous laboratory and field demonstrations of perchlorate treatment in groundwater and test the effectiveness of electron donor addition for stimulating biological perchlorate reduction within vadose zone soils at the field scale. Two primary methods of *in situ* vadose zone soil treatment were proposed to be examined for cost and applicability: 1) injection/infiltration of a liquid phase electron donor and 2) surface soil amendment with a slow-release electron donor followed by soil watering to transport that electron donor into the vadose soil. Several sites at the Naval Warfare Center, Indian Head Division, Indian Head, MD (NSWC-IHDIV) were initially evaluated and deemed to be unsuitable for the demonstration due to either geological constraints (i.e., thin vadose zone or poorly conductive vadose soils) or a lack of perchlorate contamination in the vadose zone (see Section 3.1.1). As a result, an alternate demonstration location with suitable geology and contaminant distribution was selected, the Tronox LLC (Tronox) facility in Henderson, NV. This facility, which was formerly a perchlorate fuel production plant for the US Navy and then the Kerr-McGee Corporation, was found to have substantial quantities of perchlorate in vadose

soils and groundwater, and was deemed to be a potential user of the type of technology this project intended to demonstrate.

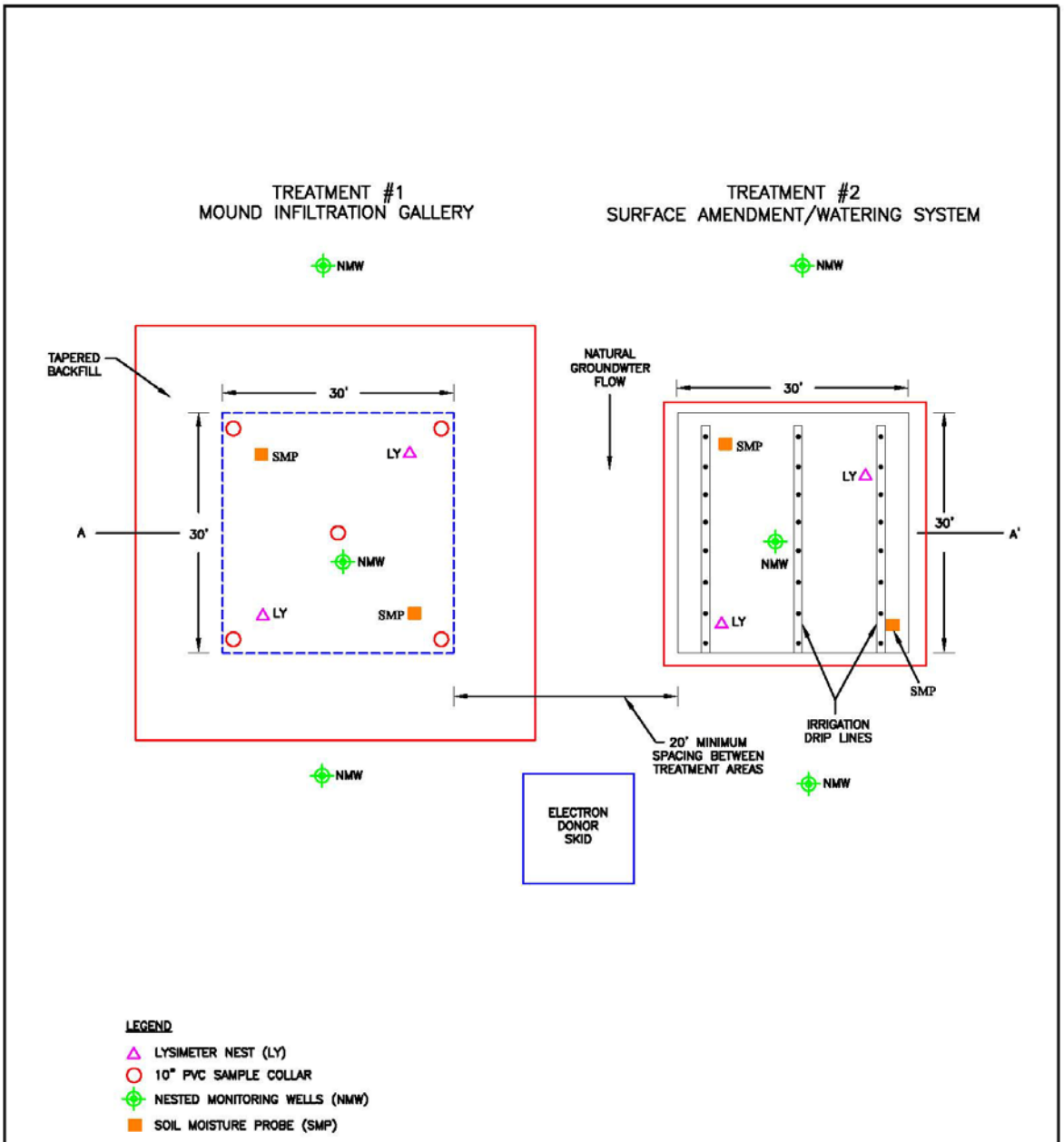
1.2 Technical Objective

The objective of this demonstration was to evaluate the cost and performance of two different bioremediation approaches for removing perchlorate in deep vadose zone soils. The first approach entailed delivering soluble electron donor to the subsurface soils through an engineered infiltration gallery and the second entailed mixing the electron donor into the upper, surficial soil, then watering the surface to promote infiltration to deeper regions. Schematics showing the proposed treatment approaches in plan and cross-section view are provided as Figures 1.1 and 1.2.

Table 1.1 Potential Thickness of Unsaturated Soils Impacted with Perchlorate at Several Sites.

Site	Location	Thickness of Unsaturated Soil (ft)	Perchlorate in Groundwater
NSWCIHDIV Site 21	Indian Head, MD	40-45[1]	798 µg/L[1]
Jet Propulsion Laboratory	Pasadena, CA	200[2]	3,600 µg/L[8]
Thiokol Propulsion	Brigham City, UT	60 – 400[1]	5,000 mg/L[5]
Edwards AFB (Site 285)	Edwards, CA	125 – 190[2]	>10,000 µg/L[4]
American Pacific Corp.	Henderson, NV	50 –300[1]	350 mg/L[7]
GenCorp Aerojet	Rancho Cordova, CA	100 – 300[1]	6 mg/L[6]
Los Alamos National Labs	Los Alamos, NM	50 – 740[1]	1,622 µg/L[11]
White Sands Missile Range	White Sands, NM	70 - 200[3]	21,000 µg/L[11]
Holloman AFB	Alamogordo, NM	300 - 400[3]	40 µg/L[9]
Boeing Corp.	Rancho Cordova, CA	100 – 300[1]	1,600 µg/L[11]
Mass. Military Reservation	Cape Cod, MA	40 – 150[2]	300 µg/L[11]
Melrose Bombing Range	NM	110 - 135[3]	25 µg/L[11]
Cannon AFB	Clovis, NM	300[3]	7 µg/L[10]
Whittaker Bermite	Santa Clara, CA	50 - 400[2]	300 µg/L

[1] Personal communication with site personnel.
[2] From Remedial Investigation (RI) or other site report.
[3] New Mexico Environmental Department (NMED). From USGS quarterly reports.
[4] Edwards AFB. Listed is highest concentration. Average concentration at site 285 is 300 µg/L.
[5] Applied Research Associates, Inc. Note the units are mg/L. USEPA reports 600 ppm in 2000.
[6] Shaw/Envirogen. Note the units are mg/L.
[7] Calgon. Note the units are mg/L.
[8] NFESC (Naval Facilities Engineering Service Center).
[9] USEPA 2000. Concentration in groundwater is 40 µg/L. Concentration in surface water is 16,000 µg/L.
[10] Environmental Working Group.
[11] USEPA 2000.



REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

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CONCEPTUAL IN-SITU TREATMENT OF PERCHLORATE IN VADOSE ZONE SOILS
Tronox, LLC, Henderson, NV

FIGURE 1.1
SCHEMATIC PLAN VIEW
PROPOSED VADOSE TREATMENTS

DESIGNED BY	JBD	10/13/08	CHECKED BY		
DRAWN BY	BEB	10/13/08	APPROVED BY		

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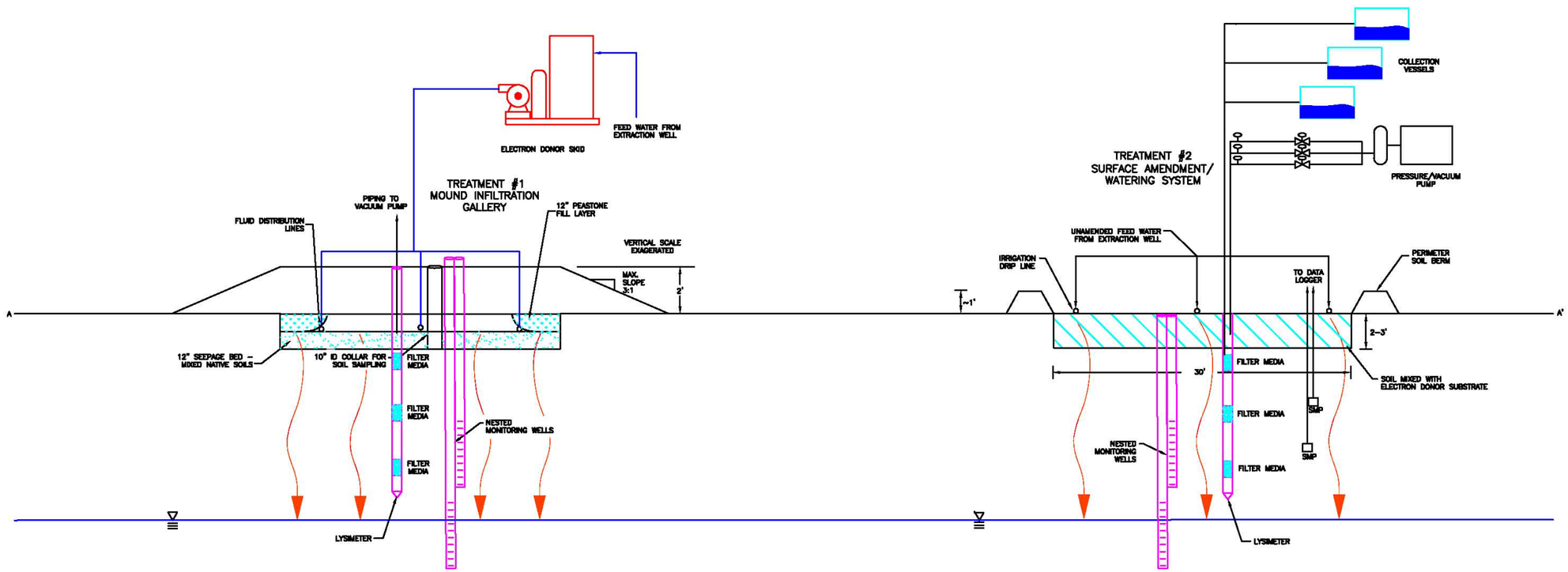

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CONCEPTUAL IN–SITU TREATMENT OF PERCHLORATE IN VADOSE ZONE SOILS
Tronox, LLC, Henderson, NV

FIGURE 1.2
A–A' CROSS SECTION
PROPOSED VADOSE TREATMENTS

DESIGNED BY	JBD	10/13/08	CHECKED BY	
DRAWN BY	BEB	10/13/08	APPROVED BY	

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2.0 Technology

2.1 Technology Description

The primary objective of this project was to demonstrate and validate the treatment of perchlorate within vadose zone soils through bioremediation and flushing via two electron donor delivery methods: Treatment #1, the infiltration of liquid electron donor using an engineered infiltration gallery; and Treatment #2, the addition of a electron donor source to the upper soil column and periodic watering to promote vertical distribution within the vadose zone (see Figures 1.1 and 1.2). For Treatment #1, an engineered infiltration gallery was to be designed to effectively deliver and distribute the electron donor to the perchlorate-impacted vadose soils. For Treatment #2, a complex electron donor source such as emulsified vegetable oil or cow manure was to be mixed into the upper meter of the soil, and an automated sprinkling system designed to supply water over the test plot area and promote vertical penetration of the electron donor agent along with the infiltrating waters. Due to underground injection control permitting requirements, it was expected that Lake Mead water (unchlorinated) would be used during this project to provide water to both treatment plots (see Figures 1.1 and 1.2). Lake Mead water was to be collected and amended with electron donor (for Treatment #1 only) and, if necessary, other amendments (e.g., pH buffering agents or nutrients). The most effective electron donor for each treatment method (both liquid and solid donors were tested in the laboratory) was determined in microcosm studies performed at Shaw Environmental, Lawrenceville, NJ (see Section 3.2). Quantities of the lake water were to be directed to the infiltration gallery and the surface treatment areas, which would release the water into the vadose zone soils causing a vertical spreading of the electron donor and amendments throughout the vadose zone. Soil moisture probes, suction lysimeters, and a network of groundwater monitoring wells were proposed to measure the variability and flux of perchlorate within the vadose zone and groundwater (wells) throughout the demonstration. Two suction lysimeter nests were to be installed in each treatment plot (total of 4 nests) with screens set in the upper, middle, and lower thirds of the vadose zone for monitoring purposes. Additionally, soil moisture probes were proposed to be installed at approximately 10 and 20 ft below ground surface (bgs) in order to observe the propagation of the wetting front. See Figures 1.1 and 1.2 for plot details. The rate of fluid infiltration was to be varied within each treatment area during the study and the corresponding effect on contaminant mobilization and degradation rates monitored.

2.2 Technology Development and Maturity

Numerous studies reveal that PRB are widespread in the environment, including soils and groundwater, and that these organisms can be stimulated to biodegrade perchlorate from mg/L (water) or mg/kg (soil) concentrations to low µg/L or µg/kg concentrations, respectively, using a variety of different electron donors (ITRC, 2008; Coates and Achenbach, 2004; Hatzinger, 2005;

Logan, 1998; Waller et al., 2004; Chaudhuri et al., 2002). During the past decade, full-scale *in situ* and *ex situ* groundwater treatment systems have been designed and implemented utilizing native bacteria to biodegrade perchlorate (ITRC, 2008; Hatzinger, 2005). A limited number of field and full-scale applications of perchlorate biodegradation for surface soil and shallow vadose soil clean-up have also been reported (Evans et al., 2008; Cox et al., 2000; Logan, 2001; ITRC, 2008). A gas injection system for vadose treatment (GEDIT) is also presently completing testing through the ESTCP program (ITRC, 2008). However, significant testing, evaluation and cost comparison of various approaches for delivering liquid electron donors to deep vadose soils for perchlorate bioremediation have not been conducted.

Infiltration galleries and vertical injection points have been applied for treating vadose zone soils contaminated with both organic contaminants such as solvents and petroleum compounds and inorganics such as hexavalent chromium and other metals (Ellis et al., 2002; Flatham and Bottomley, 1994). In these applications, typically liquid forms of oxidizing, reducing, or biological stimulation agents are introduced to the source area vadose zone soils and allowed to vertically migrate through the contaminated soils, thereby treating the contaminant of concern in place. *In-situ* soil washing techniques have also been employed in a similar manner to flush the contaminant to the groundwater for capture and/or treatment. In addition, various studies have been conducted at Aerojet (CA) and the Longhorn Army Ammunition Plant (TX) to demonstrate the ability to reduce perchlorate within surficial and shallow vadose zone soils via the application of a mixture of manure, ethanol, and other amendments to the ground surface (see review of surficial soil treatment approaches in ITRC, 2008).

This ESTCP demonstration proposed to utilize an engineered infiltration gallery to deliver electron donor and water to the subsurface for perchlorate remediation, and compare the results with this system to a more simple approach consisting of surface soil amendment with electron donor followed by watering to deliver the donor to deeper vadose soils. The latter approach has already proven to be successful for shallow surficial and vadose soils, but success for treatment of deeper vadose soils requires additional testing.

2.3 Advantages and Limitations of Biological Perchlorate Treatment in Vadose Soils

The use of electron donor addition to stimulate biological perchlorate reduction has been extensively tested in the laboratory, and has been successfully applied to both *in situ* and *ex situ* remediation of groundwater at full scale (see Section 1.1). Biological approaches have also been applied successfully to surface soils in the laboratory, and to a more limited extent at the field scale (ITRC, 2008). The key advantages of biological remediation of perchlorate in soils and groundwater are as follows:

- The approach is destructive and results in innocuous degradation products (i.e., chloride and water).
- In general, both high (> 1000 mg/L or mg/kg) and low (< 100 μg/L or μg/kg) perchlorate concentrations can be treated to < 10 μg/L or μg/kg.
- PRB are ubiquitous in most environments, so bioaugmentation is rarely necessary.
- Many different common and inexpensive electron donors have been shown to support perchlorate biodegradation in the laboratory and field.

Laboratory studies and small-scale field demonstrations of *in situ* perchlorate treatment in soils and groundwater have shown remarkable success. However, there are potential concerns and limitations with biological treatment. Key concerns are as follows:

- Rates of perchlorate bioreduction have been observed to decrease markedly at a pH of less than ~ 5.7 (Hatzinger et al., 2006; Wang et al., 2008). Therefore, if the soils at the selected site have a low pH, soil buffering may be required.
- Due to the high solubility of perchlorate, the infiltration of water and electron donor into the vadose zone will likely result in some mobilization or flushing of perchlorate. This study intended to measure the amount of perchlorate mobilization using a proposed lysimeter and monitoring well network.
- One significant risk with all *in situ* remediation systems is that bacterial biomass can clog infiltration galleries, injection wells, and/or extraction wells (or zones) (Chopra et al., 2004, 2005; Stroo and Ward, 2008). Of particular concern with the mounded infiltration gallery is that biological fouling could promote irregular distribution of liquid donor to underlying soils. It is anticipated that this condition can be minimized with proper design of the distribution system to insure equal distribution to all parts of the mound infiltration system and fouling control options were to be studied as part of the proposed demonstration.

If successful, this demonstration was designed to provide DoD with one or two widely applicable *in situ* remediation approaches for treating deep vadose soils with perchlorate. These technologies are anticipated to be critical at some of the most contaminated locations (e.g., near manufacturing plants, hog-out facilities, Open-Burn, Open-Detonation Areas) because high perchlorate concentrations in source area vadose soils may contribute perchlorate to groundwater for many decades in the future (Newman et al., 2005; ITRC, 2008). The only other applicable technologies for treatment of surficial and moderately deep vadose soils are flushing, which involves infiltrating clean water to accelerate the contaminant desorption process within the vadose zone, combined with treatment of perchlorate within the saturated zone (through *in situ* bioremediation or groundwater extraction and ex-situ treatment), phytoremediation, which is unlikely to be applicable in many regions with deep contamination, and thermal desorption, which is both intrusive and expensive (see recent review in ITRC, 2008). As previously noted, however, due to difficulties in locating a suitable demonstration site in a timely manner, the field

portion of this project was not executed. A summary of all site assessment and treatability work completed for the project is provided in the following sections.

3.0 Summary of Work Completed

The subsequent sections outline site selection, limited site characterization, and laboratory microcosm testing activities which were completed during the course of this project.

3.1 Site Selection, Characterization, and Sample Collection

A site selection process was implemented in order to determine an appropriate area to perform the vadose zone field demonstration. This process entailed a review of relevant geological, hydrogeological and contaminant information from three candidate sites: (1) Naval Surface Warfare Center, Indian Head Division, Indian Head, MD (NSWC-IHDIV); Aerojet General Corporation, Rancho Cordova, CA (Aerojet), and Tronox LLC, Henderson, NV (Tronox). A fourth candidate site, Edwards Air Force Base, CA (Edwards) was also contacted. However, due to plans for implementation of remedial activities at the base, Edwards personnel declined to pursue hosting this demonstration project.

Based on an initial data review, limited investigation work was conducted at two sites: NSWC-IHDIV and Tronox. Because NSWC-IHDIV was initially a federal partner on this ESTCP project, candidate locations at the facility were evaluated prior to consideration of alternate sites. Preferred sites for the demonstration have the following characteristics: (1) 5 to 20 M (~ 15 – 65 ft) of vadose zone soil, (2) relatively flat topography (3) vadose zone soils impacted with perchlorate at levels >1 mg/L and <1,000 mg/L (for sites that do not have groundwater capture and perchlorate treatment systems in place), (4) semi-permeable to permeable soils that will enable the adequate infiltration of water and liquid electron donors, and (5) access to electrical power.

3.1.1 Site Investigation at NSWC-IHDIV

Based on an initial review of site characteristics and historical operations, soil investigation work was conducted at two locations at NSWC-IHDIV. The sites evaluated at the NSWC-IHDIV facility were near Building 1018 (Fine Grinding) and Building 602/IR Site 21 near an abandoned landfill. Other locations such as the Hog-out facility (Building 1419) and the various propellant burning, handling, and storage areas were reviewed but deemed unsuitable due to shallow groundwater conditions (see Hatzinger et al., 2006).

Field characterization was performed using direct-push (Geoprobe™) techniques and continuous sediment cores were collected for geological and contaminant analysis. Standard Geoprobe™ penetrations were conducted with a vehicle-mounted rig with a Teflon®-lined core-barrel sampler mounted on the leading end of the penetration probe rod. The sampler and probe rods were advanced to allow soil to enter the sample barrel. The sample barrel assembly was then removed, and the soil sample extruded for analysis. At each site under consideration, a total of

three to four Geoprobe™ borings were installed to a maximum depth of approximately 35 ft below the ground surface (bgs).

Samples were classified in the field by Shaw professional staff in accordance with the Unified Soil Classification System (USCS). Logs of the borings were completed indicating the depth and identification of the various strata and depth to groundwater, if encountered. Selected soil samples were collected for laboratory analysis of perchlorate, nitrate, sulfate, and volatile organic compounds (VOCs). The pH of the soil was also measured.

A total of three Geoprobes™ were advanced in an open area south of Building1018. The shallow soils at each Geoprobe™ location were found to be predominantly silty clays down to the saturated zone. Based on the fine-grained nature of the soils at this location, this site was deemed to be unsuitable for the proposed amendment delivery process. No soil samples from this site were analyzed for the presence of perchlorate.

A total of four Geoprobes™ were advanced south of Building 602 and east of the abandoned landfill (IR Site 21). The shallow soils at this location consisted of intermittent layers of silty sands and clayey silts with occasional lenses or stringers of gravel and finer grained deposits. Groundwater was encountered at approximately 24 ft bgs in this area. The lithology and thickness of vadose zone (approximately 24 ft) appeared to be suitable for the proposed demonstration project.

Based on the lithologic characteristics and vadose zone thickness, Shaw selected five samples from each boring (a total of 20 samples) for chemical analysis (data not presented). The samples were selected from random depth intervals within the vadose zone (between 4 and 24 ft bgs). Perchlorate was only found to be present at levels above the practical quantitation limit (PQL) of 20 micrograms per kilogram (µg/kg) or parts per billion (ppb) in 2 of 20 samples (49.5 µg/kg in GP-4:14-16 ft; and 1,180 µg/kg in GP-4:20-22 ft). One sample had a reported positive detection that was a j-flagged estimated value (10.1 µg/kg in GP-5:10-12 ft). Based on the low levels and poor distribution of perchlorate within the vadose zone soils at this site, it was also deemed to not be suitable for the proposed demonstration project.

3.1.2 Site Investigation at Tronox

Following an initial review of site features and operational history for the Tronox site, soil investigation work was conducted at two locations at Tronox. The sites evaluated were near Old Building D1 (Old Bldg D1), which was used for blending operations, and an open area to the east of Old Bldg D1 and north of wastewater holding pond AP-5.

Field characterization was performed in January 2008. Test borings were installed using hollow-stem auger drilling and split spoon techniques. Semi-continuous sediment cores were collected

for geological and contaminant analysis. The hollow-stem auger borings were advanced until the top of the desired sample interval was reached. The split-spoon sampler and drive rods were then lowered down the center of the hollow-stem auger string and the split-spoon was driven 2 ft beyond the auger bit into undisturbed soil strata. The sample barrel assembly was then removed, and the soil sample extruded for analysis. At each site under consideration, a total of two to four borings were installed to a maximum depth of approximately 35 ft below the ground surface (bgs) (see Appendix A)..

A second event, was initiated in December 2008, however, this event was aborted upon notification from ESTCP that funding for subsequent field study work was being terminated. No data related to this event has been reduced and included in this report.

Samples were classified in the field by Shaw professional staff in accordance with the Unified Soil Classification System (USCS). Logs of the borings were completed that indicate the depth and identification of the various strata and depth to groundwater. Selected soil samples were collected for laboratory analysis of perchlorate, chlorate, nitrate, sulfate, and RCRA metals. The pH level within the soil was also measured. During the January 2008 event, groundwater samples were also collected from three of the borings by lowering a bailer through the augers to retrieve the water sample.

During the January 2008 event, , a total of four borings (SB-3 through SB-6) were advanced in the open areas adjacent to the south (Area 1A) and west (Area 1B) sides of Old Bldg D1 and two borings (SB-1 and SB-2) were advanced in the open area east of Old Bldg D1 and north of AP-5 (Area 2). The approximate area outlines and boring locations are shown in Figure 3.1.

The shallow soils encountered in all of the borings were similar between areas 1 and 2. The soils consisted of sands and gravel with some silts (Quaternary Alluvium (Qal) extending from the ground surface down to between 25 and 30 ft bgs. Occasional pockets or thin layers of finer grained silty sands or sandy silts were noted within the shallow soil interval. A fine grained sandy silt layer (likely the Upper Muddy Creek Formation) of unknown thickness was encountered in both areas beneath the shallow sand and gravel deposits. In the borings installed in areas 1A and 1B, this unit extended the maximum depth of each boring (between 30 and 35 ft bgs). First groundwater was encountered in each boring within this fine grained sandy silt layer at depths ranging from 31 to 35 ft bgs. The lithologic cross-section near Areas 1A and 1B is depicted in Figure 3.2. Based on the relatively permeable characteristics of the soils encountered and thickness of vadose zone (> 30 ft), both areas were deemed to be potentially suitable for evaluating the proposed amendment delivery processes.

Based on the lithologic characteristics and vadose zone thickness, we selected six soil samples from boring SB-4 and seven samples from all other borings (41 total) for chemical analysis.

Chemical analysis was also performed on the three groundwater samples that were collected. Perchlorate data are presented in Table 3.1 and are also included on the cross-section depicted on Figure 3.2 (see Appendix B for all analytical results). Elevated levels of perchlorate were found throughout the vadose zone column and in the underlying groundwater. The average perchlorate concentration in all boring samples was 394 $\pm$ 108 mg/kg (n=41). While several soil samples contained perchlorate at levels >1,000 mg/kg, this was not deemed to be a concern at this site due to the fact that a groundwater capture and perchlorate treatment system was in-place and operational. This system includes a slurry wall barrier and series of groundwater capture wells located downgradient from the potential demonstration sites, and an upgradient fluidized bed reactor for groundwater treatment (Hatzinger, 2005).

Besides perchlorate, the soil samples collected from each borehole had chlorate concentrations ranging from non-detect (< 1 mg/kg) to ~ 1,400 mg/kg, and nitrate concentrations ranging from < 1 mg/kg to 85 mg/kg nitrate-N. Concentrations of both chlorate and nitrate were highly variable within each borehole. The average soil pH was 8.9 $\pm$ 0.4 (n=41). Select samples were also tested for metals, including Pb, As, Cd, Cr, Ba, Hg, Ag, and Se. Among these metals, soil concentrations were 12 $\pm$ 8 mg/kg for As, 210 $\pm$ 84 mg/kg for Ba, 19 $\pm$ 6 mg/kg for Cr, and 9 $\pm$ 3 mg/kg for Pb. The other metals were below applicable detection limits (~ 0.04 mg/kg for Hg to ~ 3 mg/kg for Se). Although the concentrations of some metals, particularly Ba, were elevated, there was no indication that these metals would cause issues with perchlorate bioremediation.

LEGEND

BORING LOCATIONS

WATER METER LOCATION

FORMER MIXING BLDG (S) LOCATION (APPROX)

POTENTIAL DEMONSTRATION AREA

GRAPHIC SCALE

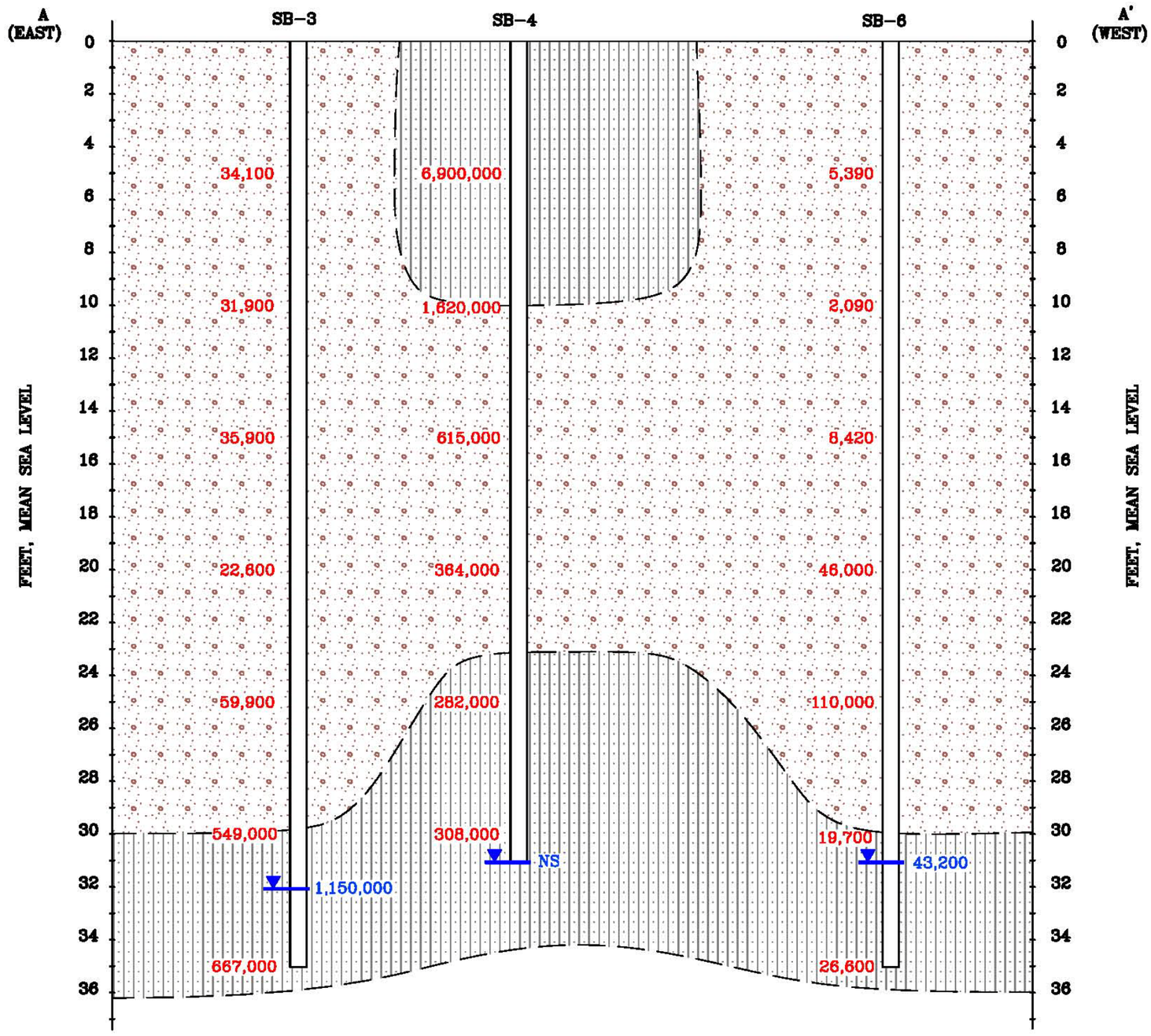
0' 60' 120'

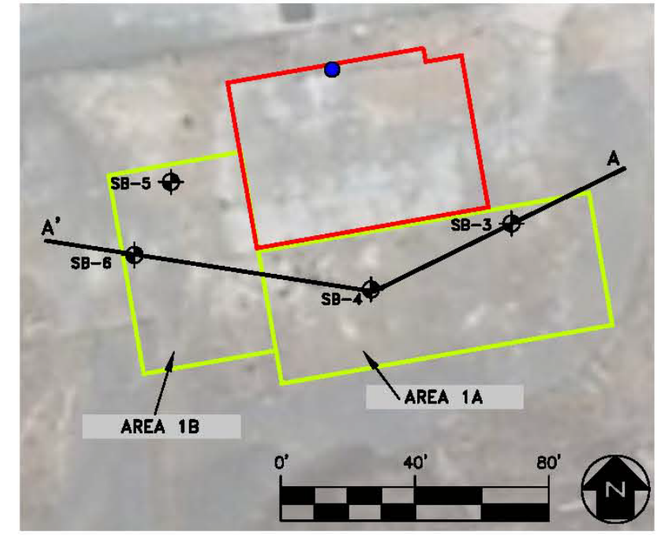
ESTCP / Tronox, LLC
Washington, DC / Henderson, NV

FIGURE 3.1
Initial Boring Locations

Potential Demonstration Plot Areas
Tronox LLC, Henderson, NV

ER-0435 – Demonstration of Perchlorate Treatment in Vadose Zone Soils





EXPLANATION:

STATIC GROUNDWATER LEVEL

SOIL CONTACT – DASHED WHERE INFERRED

5,390 PERCHLORATE IN SOIL (µg/kg)

43,200 PERCHLORATE IN WATER (µg/l)

SURFACE/SOIL UNITS:

SAND

SILT

NOTES:

SURFACE ELEVATIONS ARE APPROXIMATED

VERTICAL SCALE: 1" = 4'

HORIZONTAL SCALE: 1" = 20'

Shaw

ESTCP / Tronox, LLC
Washington, DC / Henderson, NV

FIGURE 3.2
Geologic Cross–Section A – A'

Potential Demonstration Plot Area #1
Tronox LLC, Henderson, NV

ER–0435 – Demonstration of Perchlorate Treatment in Vadose Zone Soils

Table 3.1. Preliminary Perchlorate Concentrations from Borings taken at the Tronox Site.

SOILS						
	Area 2		Area 1A		Area 1B	
Depth (ft)	SB-1 Concentration (µg/kg)	SB-2 Concentration (µg/kg)	SB-3 Concentration (µg/kg)	SB-4 Concentration (µg/kg)	SB-5 Concentration (µg/kg)	SB-6 Concentration (µg/kg)
5	9,010	83,600	34,100	6,900,000	5,410	5,390
10	49,900	261,000	31,900	1,620,000	13,900	2,090
15	222,000	391,000	35,900	615,000	80,400	8,420
20	329,000	165,000	22,600	364,000	213,100	46,000
25	759,000	245,000	59,900	282,000	270,000	110,000
30	380,000	58,500	549,000	308,000	123,000	19,700
35	432,000	301,000	667,000	NS	69,700	26,600
Ave	311,559	215,014	200,057	1,681,500	110,787	31,171

WATER						
	Area 2		Area 1A		Area 1B	
	SB-1 Concentration (µg/L)	SB-2 Concentration (µg/L)	SB-3 Concentration (µg/L)	SB-4 Concentration (µg/L)	SB-5 Concentration (µg/L)	SB-6 Concentration (µg/L)
SB-1	826,000	NS	1,150,000	NS	NS	43,200

3.2 Laboratory Microcosm Testing

3.2.1 Methods

A laboratory microcosm study was conducted to determine the most effective electron donor(s) for perchlorate treatment in the vadose zone of the Tronox demonstration site. A representative subset of the vadose soil samples collected during the investigation work completed at Tronox in January 2008 were used for this study. After field collection, the split spoon soil samples from each core were shipped to the Shaw Treatability Laboratory (Lawrenceville, NJ) for analysis of perchlorate concentrations (see Section 3.1.2). These samples were subsequently stored at field moisture and 4°C for use in the treatability studies.

For the microcosm testing, the complete core collected from location SB-4 (see Table 3.1) was selected. The core samples were removed from the acetate sleeves (core from 5 ft bgs to 30 ft bgs) and then the solids from each sleeve was combined, passed through a 9.5 mm sieve to remove any large rocks and debris, and then homogenized and placed at 4°C. Prior to distributing the soil to sample bottles, a bulk soil gravimetric moisture measurement was taken in triplicate. The estimated soil "water holding capacity (WHC)" was also determined in the laboratory. To determine the current gravimetric soil moisture the following procedure was used.

Gravimetric soil moisture determination:

1. Soil dishes or tins were pre-weighed.
2. Soil (50 g) was added to each dish or sample tin at field moisture in triplicate.
3. Soil + tin were dried at 105°C for 24 hr and reweighed.
4. The tin weights were subtracted from (3) to determine the dry soil weight.
5. The dry soil weights (4) were subtracted from the field soil weight (50 g: 2) to determine total water.
6. The total water weights (5) were divided by the dry soil weight (4) to determine the percent soil moisture (g water/g dry soil).

In order to estimate the WHC of the soil, the following protocol was used. It should be noted that more complex laboratory techniques are available using pressure plate methods and other techniques but for the purposes of this study, a simple laboratory estimate was deemed to be sufficient for this measurement.

WHC determination:

1. A filter paper and glass funnel were weighed dry (105°C) (1a) and then after wetting to saturation (1b).
2. Soil at field moisture (50 g) was added to each wet filter (triplicate samples).
3. Water was added to the soil until the soil was oversaturated.
4. Once water no longer dripped from the filter unit, the wet soil + wet filter/funnel was weighed.
5. The unit in (4) was then dried at 105°C for 24 hr and reweighed.
6. The wet funnel/filter weight (1b) was subtracted from (4) to determine the field saturated soil weight.
7. The dry funnel/filter weight (1a) was subtracted from (5) to determine the dry soil weight.
8. The dry soil weight (7) was subtracted from the wet soil weight (6) to determine total water in the soil.
9. The total water weight (8) was divided by the dry soil weight (7) to determine the percent soil moisture (g water/g dry soil), which is an estimate of the WHC.

The soil moisture calculations above were used to determine the quantity of water to add to each microcosm. A soil moisture percentage ranging from ~ 75 - 85% of WHC was maintained in the microcosms in an attempt to simulate unsaturated conditions within the vadose zone during the demonstration. Two sets of different electron donors were tested in the microcosm studies. The first set included primarily liquid donors that could be applied in the infiltration gallery (see Treatment #1 amendments below). The second set of donors were solids and/or slowly degrading liquid amendments that could be mixed into the surficial soils periodically, then distributed with watering (see Treatment #2 amendments below).

The microcosms consisted of 250-mL amber glass sample jars with Teflon®-lined screw-cap lids. Each bottle initially received 185 g of soil at field moisture. Stabilized water from Lake

Mead was collected from the Tronox site for microcosms to best simulate field conditions (i.e., this water would be used in the field to distribute amendments). Based on the soil moisture determination, additional water was added to each bottle to bring the moisture to ~ 85% of the WHC calculated from laboratory measurements. The bottles were initially set up under aerobic conditions to simulate the initial addition of electron donor amendments in the field, but all further sampling and amendment additions were performed in a Coy Anaerobic Chamber under a nitrogen gas headspace (without hydrogen gas in the mixture). All bottles that received an electron donor also received inorganic nutrients in the form of 500 mg/L diammonium phosphate (DAP) to ensure that insufficient concentrations of N and/or P do not limit perchlorate biodegradation. The amendments added to duplicate bottles were as follows:

Liquid Amendments (Treatment #1):

1. No addition (water only)
2. 37 % formaldehyde (killed control; 2% formaldehyde final concentration in the lake water)
3. Ethanol (20 mM initial concentration in soil) + DAP
4. Sodium acetate (20 mM initial concentration in soil) + DAP
5. EOS emulsified vegetable oil (1000 mg/kg initial concentration in soil) + DAP
6. Sodium lactate - low (20 mM initial concentration in soil) + DAP
7. Sodium lactate - high (200 mM initial concentration in soil) + DAP
8. Sodium citrate (20 mM initial concentration in soil) + DAP

Solid Amendments (Treatment # 2):

1. Calcium magnesium acetate (3000 mg/kg) + DAP
2. Cheese whey (500 mg/kg) + DAP
3. Soybean oil/peat moss (1:2) + DAP
4. Bioreactor sludge + DAP
5. Bioreactor sludge + sodium lactate (20 mM initial concentration in soil) + DAP

Among the various amendments added, EOS is an emulsified vegetable oil substrate (Zawtocki et al., 2004; Borden et al., 2007a,b), and the bioreactor sludge consisted of solids taken from the operating biological perchlorate treatment system at the Tronox site (Hatzinger, 2005). The other amendments require no further detail. All amendments were thoroughly mixed into the soil, and stabilized lake water was added to each to achieve a soil moisture equivalent to ~85% of the calculated WHC. After mixing, duplicate subsamples (A&B) were collected from each jar in the Coy chamber under a pure nitrogen headspace. The sampling and extraction of perchlorate in the soil was then conducted according to a modification of SW-846 Method 6850 (www.epa.gov/waste/hazard/testmethods/pdfs/6850.pdf), which entails aqueous extraction of perchlorate with shaking and vortexing of soils for mixing. The procedure used is as follows:

Perchlorate Extraction and Analysis from Soil:

1. Place jars in Coy Anaerobic Chamber with pure N_2 headspace.
2. Shake jars vigorously by hand.
3. Remove 5 g soil into a pre-weighed, sterile 50-mL screw-cap polypropylene centrifuge tube (Corning). Label tube as "Sample A".
4. Repeat Step 3 – Label tube as "Sample B".
5. Screw cap tightly on jar.
6. Add 40 mL Milli-Q water to each centrifuge tube.
7. Vortex each tube 1 min, sonicate for 15 min, then vortex a second time for 1 min.
8. Centrifuge each tube for 5 min at 4,000 RPM to yield a clear supernatant.
9. Remove a 10-mL sample from each centrifuge tube, filter through a 0.45 µM pore-size Teflon® filter, and analyze for perchlorate by EPA Method 314.0 (Ion Chromatography) and anions (nitrate, nitrite, sulfate, chlorate, chloride, phosphate) by EPA Method 300.0.
10. After analysis is complete, dry the centrifuge tubes at 105°C for 24h and weigh (tube + dry soil)
11. Subtract the tube weight from the value in (11) to obtain a dry soil wt for each sample.
12. Report perchlorate and anion concentrations as mg/kg dry soil.

Each microcosm was sampled at T=0, then incubated at room temperature (~ 23°C) in the anaerobic chamber to prevent oxygen intrusion. The microcosms were sampled according to the above protocol after one week of incubation, then every other week thereafter for two months. After two months, sampling times were reduced to every 3 to 4 weeks for another 2 months. Microcosms receiving liquid amendments were re-amended with each electron donor and DAP at four and eleven weeks of incubation. The soil moisture was also monitored and adjusted as necessary to remain between ~ 75-85 % WHC. The total study was conducted for 18 weeks.

3.2.2 Microcosm Results

3.2.2.1 Liquid Amendments

Nitrate. The starting nitrate-N concentrations in the vadose soil ranged from ~ 130 to 150 mg/kg (Figure 3.3). The addition of lactate (20 mM) acetate, citrate and EOS resulted in rapid biodegradation of nitrate in the samples. All soil samples receiving these electron donors were below detection (1 mg/kg) within 5 weeks. Ethanol also promoted nitrate biodegradation, but over a longer timeframe, with all samples reaching non-detect levels by Week 18. Interestingly, nitrate-N in the live samples (receiving no carbon) increased 3-5 fold during the course of the experiment. A similar increase was not observed in killed samples, suggesting that this process was biotic. The source of nitrate in these samples is unclear, although oxidation of ammonium from the original NH_4ClO_4 represents one possibility (note that DAP was not added to the control samples, so the ammonium would have to be indigenous to the sample). Since the samples were originally set-up under aerobic conditions, nitrification is possible, and nitrite was detected in these samples at a maximum of > 30 mg/kg nitrite-N during week 13, which supports nitrification as a production mechanism for nitrite in these samples (Figure 3.4).

Perchlorate. The starting perchlorate in the vadose soil microcosms averaged 1,435 mg/kg. Perchlorate biodegradation was observed over the course of the 18 week study in samples receiving EOS, ethanol, and citrate (Figure 3.5a). At the conclusion of the study, perchlorate concentrations in the EOS-treated samples were < 0.3 mg/kg. Chloride concentrations in this treatment increased nearly stoichiometrically with declining perchlorate, with an average of 13.8 mM chloride produced from the 14.4 mM perchlorate biodegraded (i.e., 1 mol of chloride was released per mol of perchlorate biodegraded as expected) (data not shown). Biodegradation was also apparent in microcosms amended with ethanol and citrate, but the data were highly variable between replicate microcosms (although duplicate soil samples taken from each microcosm agreed well) (Figure 3.5b). One of the difficulties with unsaturated soils is heterogeneity, which can lead to significant variability among replicate samples, as was observed for perchlorate in some samples. The variability among replicates may be a result of the high perchlorate concentrations as well as the fact that the microcosms were unsaturated, and thus may have had air pockets, low moisture zones, and possibly regions with precipitated perchlorate crystals. Similar variability in nitrate concentrations was not observed between replicates except in the case of ethanol, where biodegradation was much more rapid in one microcosm, but final concentrations in both were below detection by 18 weeks. At the conclusion of 18 weeks, samples treated with citrate averaged 480 mg/kg and those treated with ethanol averaged 230 mg/kg.

Chlorate. Chlorate was below detection in the vadose soil microcosms (< 1 mg/kg) at the initiation of the study.

Sulfate. The starting sulfate concentration in the microcosms averaged 700 mg/kg. With the exception of one of the microcosms treated with ethanol, which declined to < 200 mg/kg, sulfate concentrations remained reasonably constant during the course of the study (Figure 3.6). It is likely that significant sulfate reduction occurred in the ethanol-treated microcosm, as both perchlorate and nitrate were also biodegraded to below detection in this sample bottle. There also was a somewhat higher concentration of sulfate in the samples treated with acetate, but this probably just reflects natural variability in the soil matrix rather than being an effect of the acetate.

Figure 3.3 Concentrations of nitrate-N (mg/kg) in soils receiving liquid amendments. Error bars are the standard deviations from four samples (duplicates from each of two sample jars per treatment).

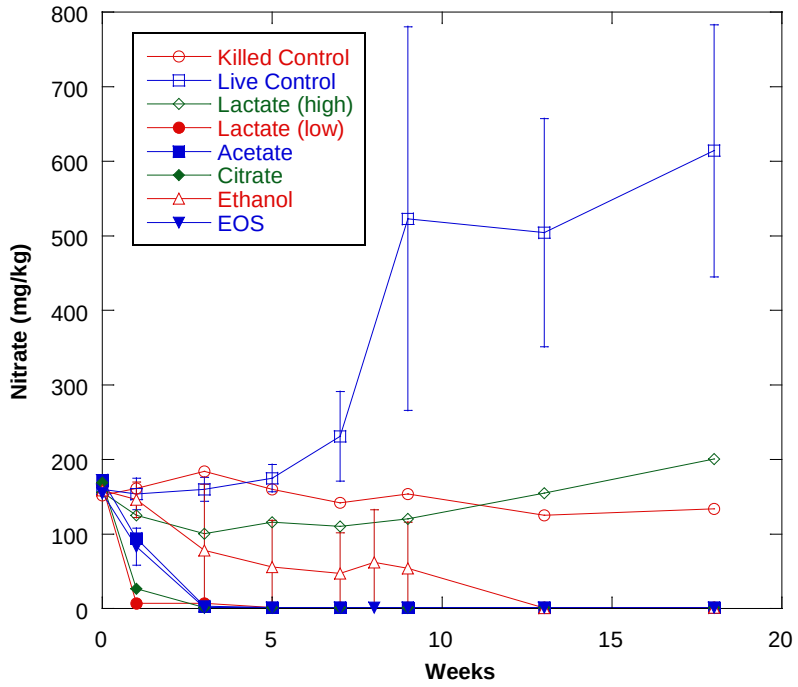


Figure 3.4 Concentration of nitrate-N and nitrite-N (mg/kg) in control microcosms. Error bars are not shown.

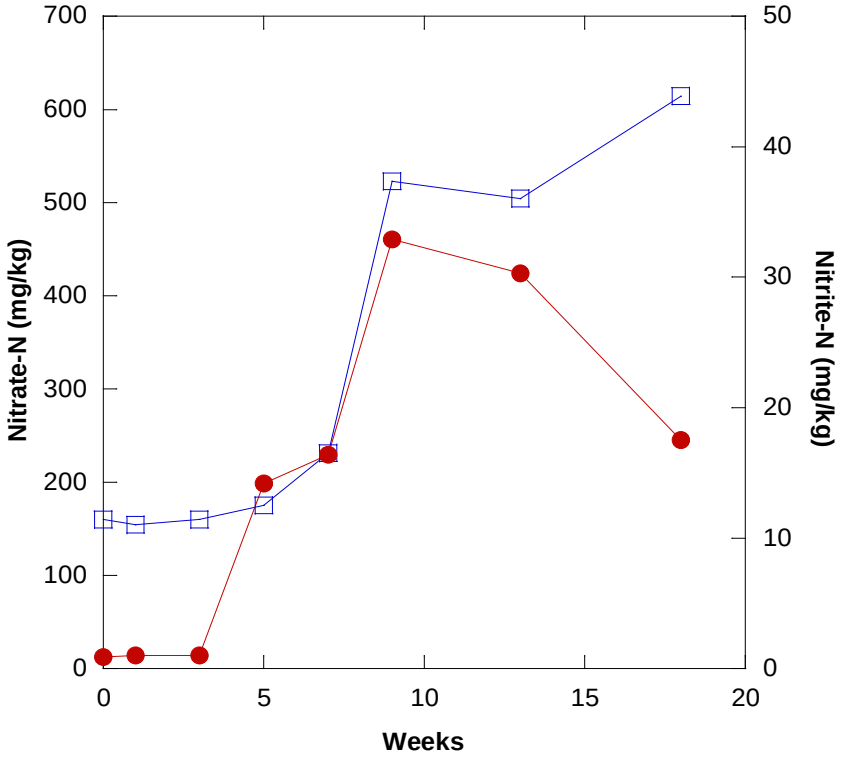


Figure 3.5a Concentrations of perchlorate (mg/kg) in soils receiving liquid amendments. Error bars are not shown.

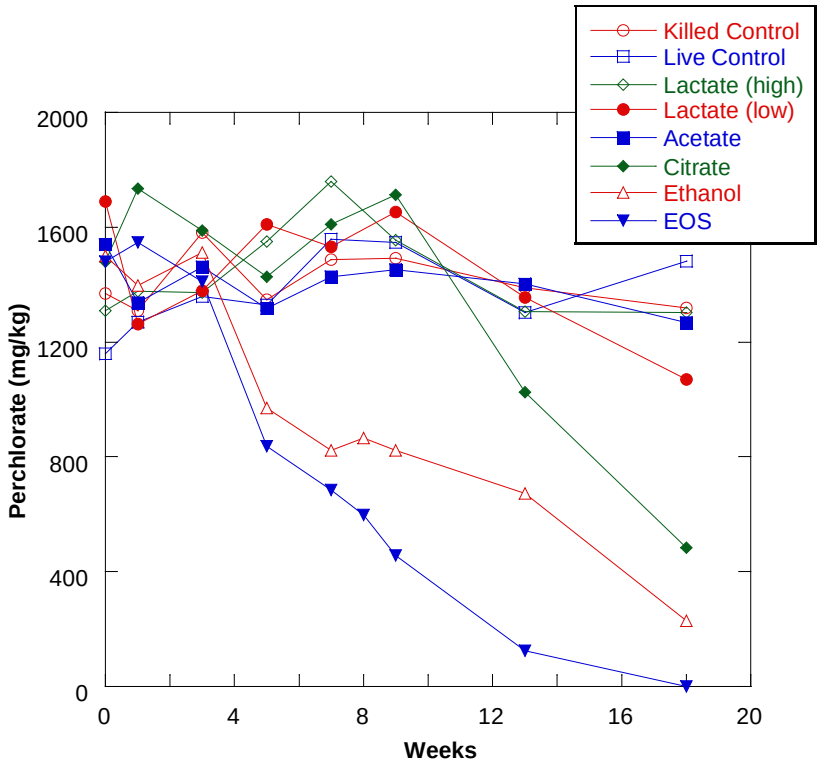


Figure 3.5b Concentrations of perchlorate (mg/kg) in a subset of soils receiving liquid amendments. Error bars are the standard deviations from four samples (duplicates from each of two sample jars per treatment).

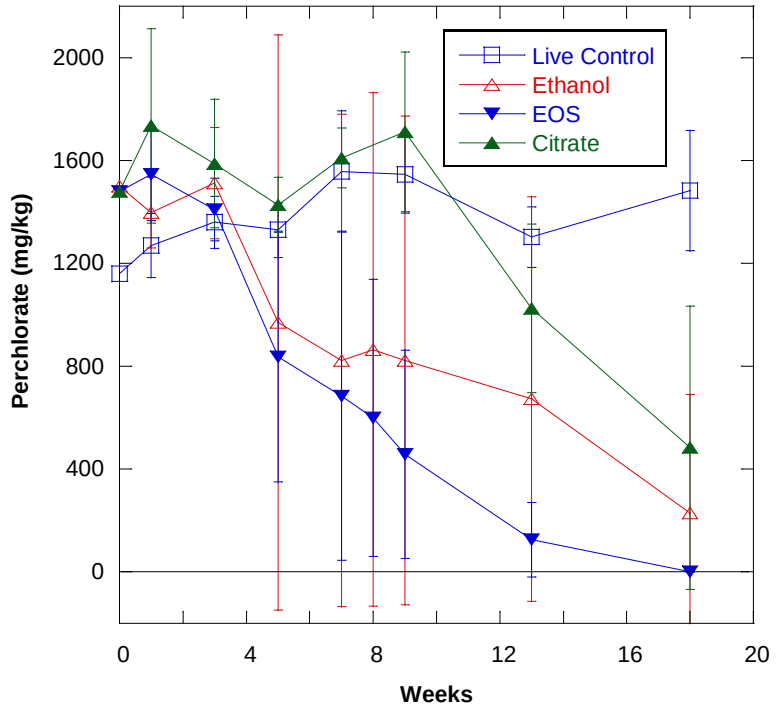
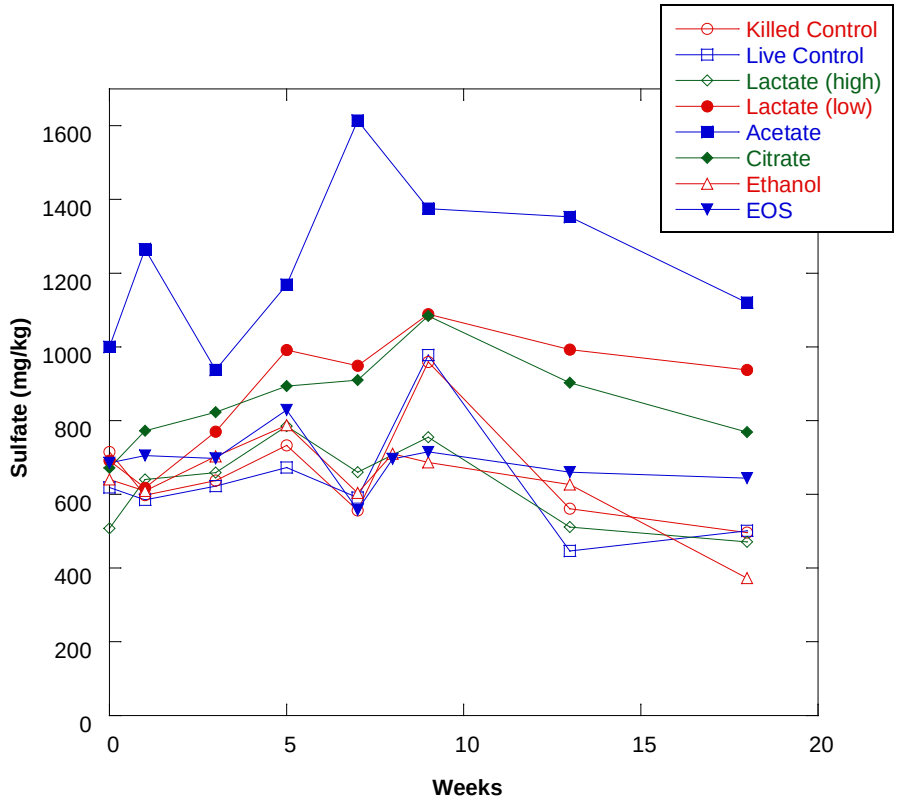


Figure 3.6 Concentrations of sulfate (mg/kg) in soils receiving liquid amendments. Error bars are not shown.



3.2.2.2 Solid Amendments

Nitrate. Among the solid and/or slow release substrates, cheese whey most rapidly promoted nitrate biodegradation (Figure 3.7). In samples amended with cheese whey, nitrate-N declined from an average of 175 mg/kg to < 1 mg/kg in 2 weeks and remained < 1 mg/kg thereafter. The addition of reactor sludge with acetate, and a mixture of soybean oil and peat moss also promoted extensive denitrification. All samples had nitrate-N < 1 mg/kg after 18 weeks. The other two substrates, CMA and reactor sludge (without acetate), were not as effective as the previous amendments, but nitrate reduction was observed over the 18 week study with each amendment.

Perchlorate. The most effective solid amendments for promoting perchlorate biodegradation were soybean oil with peat moss and bioreactor sludge with acetate (Figure 3.8). At the end of 18 weeks, perchlorate concentrations in samples receiving these substrates were 45 mg/kg and 135 mg/kg, respectively, from a starting average concentration of 1,430 mg/kg. Cheese whey also promoted perchlorate biodegradation, but the degradation was slower and more variable than for the other substrates. At the end of 18 weeks, one replicate contained 1000 mg/kg and the second only ~ 25 mg/kg.

Chlorate. Chlorate was below detection in the vadose soil microcosms (< 1 mg/kg) at the initiation of the study.

Sulfate. Sulfate declined from ~ 700 mg/kg to 270 mg/kg over 18 weeks in samples receiving soybean oil and peat moss, suggesting that this substrate promoted appreciable sulfate reduction (Figure 3.9). Sulfate concentrations remained reasonably constant in soils receiving most of the other treatments, although an increase was apparent in the microcosms receiving acetate plus bioreactor sludge or sludge only. In the latter treatments, it is possible that sulfate concentrations were high in the bioreactor sludge, thus accounting for the increase.

Figure 3.7 Concentrations of nitrate-N (mg/kg) in soils receiving solid amendments. Error bars are the standard deviations from four samples (duplicates from each of two sample jars per treatment).

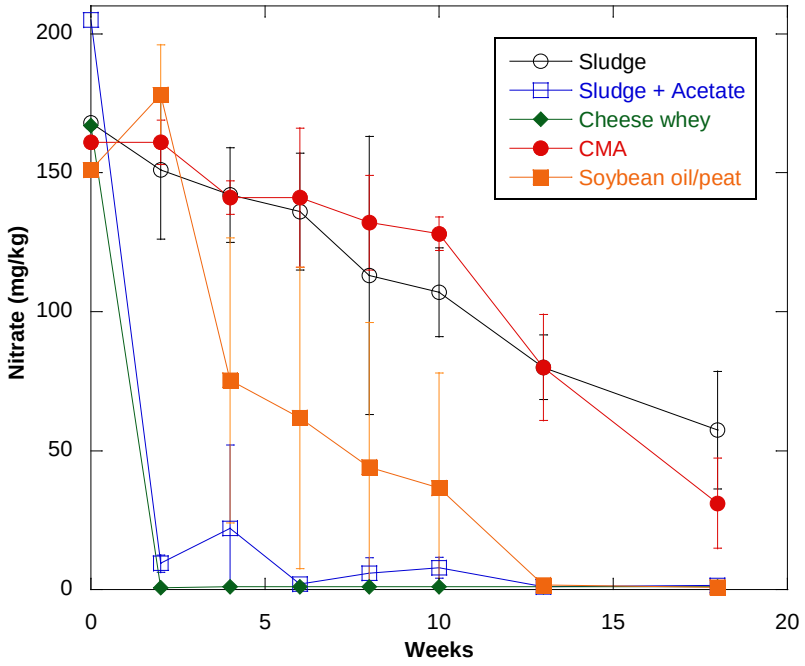


Figure 3.8 Concentrations of perchlorate (mg/kg) in soils receiving solid amendments. Error bars are the standard deviations from four samples (duplicates from each of two sample jars per treatment).

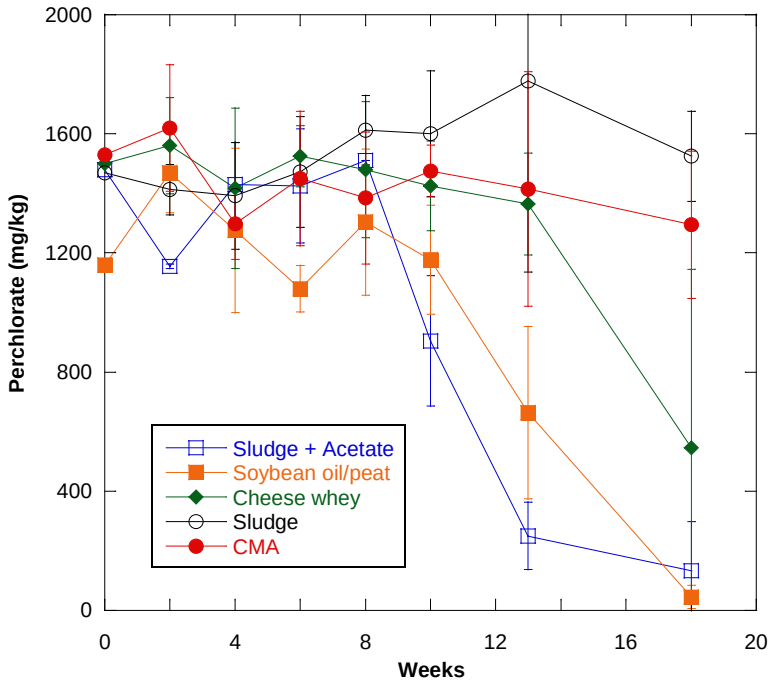
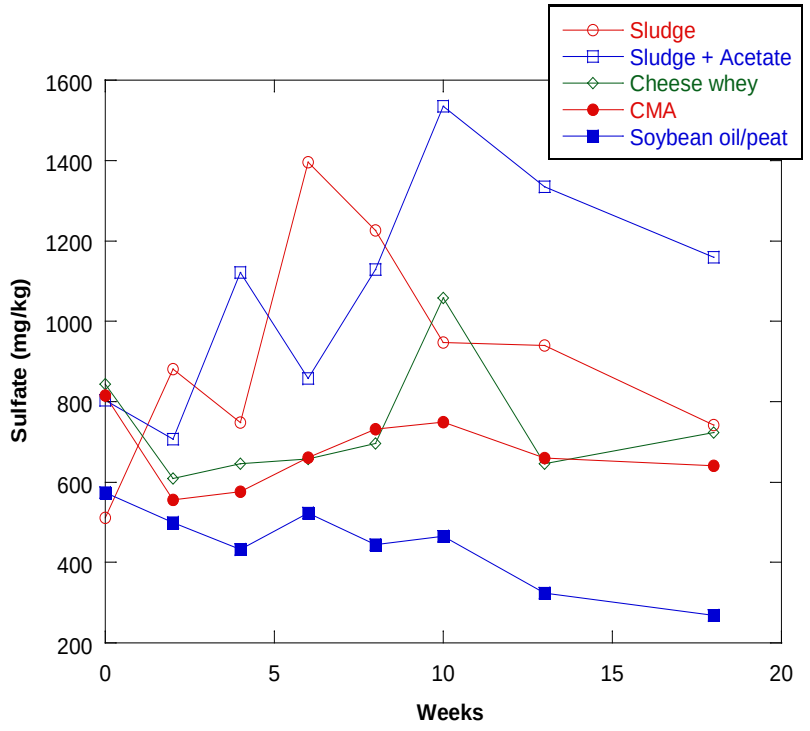


Figure 3.9 Concentrations of sulfate (mg/kg) in soils receiving solid amendments. Error bars are not shown.



3.2.3 Discussion of Laboratory Data

The results of this microcosm study showed that three liquid amendments (EOS, ethanol, and citrate) were effective for promoting biological degradation of nitrate and perchlorate. Among these amendments, EOS resulted in the fastest and most consistent biodegradation of the target anions. At the conclusion of the study, perchlorate concentrations in the EOS-treated samples were consistently < 0.3 mg/kg. Previous studies have shown that EOS can be an effective substrate for promoting perchlorate biodegradation in groundwater aquifers (Hatzinger et al., 2009; Borden et al., 2007a,b, Schaefer et al., 2006). However, to our knowledge, this is the first study showing that EOS is effective in unsaturated vadose soils, and particularly in soils with perchlorate concentrations exceeding 1,000 mg/kg. Based on the laboratory results, EOS would have been recommended for use in the engineered infiltration gallery design (Treatment # 1) if the project had proceeded to the field phase.

Several solid (or solid/liquid combination) amendments also were effective for stimulating perchlorate biodegradation in the Tronox vadose soils, including soybean oil with peat moss, bioreactor sludge with acetate, and cheese whey. Among these substrates, the former two mixtures resulted in the most rapid and consistent perchlorate biodegradation. Based on the laboratory results, a mixture of soybean oil and peat moss would have been recommended for use in the surface amendment design (Treatment # 2) if the project had proceeded to the field phase.

One of the difficulties with unsaturated soils is the inherent heterogeneity compared to other sample matrices (i.e., groundwater or headspace), and this heterogeneity can lead to large variability in duplicate samples, as was observed for some treatments in this study. The extremely high concentrations of perchlorate in the vadose soils, and the possibility that some of this material was present as precipitate, probably contributed to this variability as well. However, despite the soil heterogeneity and high contaminant concentrations, the laboratory studies suggest that, if amendments can be well distributed in the vadose soil matrix, bioremediation of perchlorate from > 1,000 mg/kg to < 1 mg/kg is feasible. The field component of this project at Tronox was cancelled due to scheduling and other issues, but the laboratory studies completed to support this effort certainly suggest that perchlorate treatment in the deep vadose soils is feasible if good amendment distribution can be achieved.

4.0 Management and Staffing

Mr. Jay Diebold, **P.G., P.E.**, with Shaw Environmental, Inc., served as the Principal Investigator for the demonstration, and had overall project QA responsibility. Mr. Diebold, also served as the Project Manager, and worked closely with the project team to ensure that all efforts were fully coordinated. He served as the liaison between the project team and ESTCP.

Dr. Paul Hatzinger, with Shaw Environmental, Inc., designed and supervised all treatability study activities completed for the project, and had QA responsibility for the treatability work. Dr. Hatzinger, served as the Laboratory Project Manager, and worked closely with the project team to ensure that all efforts during the treatability study were fully coordinated.

Ms. Sheryl Streger, with Shaw Environmental, Inc., served as the Laboratory Technician in charge of conducting the tasks required in the treatability study. Ms. Streger was directed by the Project Manager and the Laboratory Project Manager.

Table 4.1. Points of Contact

POINT OF CONTACT Name	ORGANIZATION Name Address	Phone Fax E-mail	Role in Project
Jay Diebold	Shaw Environmental, Inc. 111 West Pleasant St – Suite 105 Milwaukee, WI 53212	(414) 291-2357 (office) (414) 291-2385 (fax) (262) 719-1155 (cell) **Jay.diebold@shawgrp.com**	Principal Investigator
Paul Hatzinger	Shaw Environmental, Inc. 17 Princess Road Lawrenceville, NJ 08648	(609) 895-5356 (office) (267) 337-4003 (cell) (609) 895-1858 (fax) **Paul.hatzinger@shawgrp.com**	Co-PI (Lab Studies)
Sheryl Streger	Shaw Environmental, Inc. 17 Princess Road Lawrenceville, NJ 08648	(609) 895-5374 (office) (609) 895-1858 (fax) **Sheryl.streger@shawgrp.com**	Lab Technician

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Appendices

Appendix A
Boring Logs

Drilling Log

Soil Boring **SB-1**

Project ER0435 Owner

Location Tronox Henderson, NV Facility Proj. No. 117604

Surface Elev. NA Total Hole Depth 35.0 ft. Lat. 36.0287 Long. 115.0018

Top of Casing NA Water Level Initial NA Static ▼ 31.0 ft. Diameter 8 in.

Screen: Dia NA Length NA Type/Size NA

Casing: Dia NA Length NA Type NA

Fill Material Rig/Core CME 95

Drill Co. WDC Method HSA

Driller Jeff Log By DGH Date 1/25/08 Permit # NA

Checked By License No.

COMMENTS
Collected water sample. Water was lime green.

Depth (ft.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic Descriptions are Based on the USCS.
0						
					SW	Gravelly Sand- Light brown, slightly moist, ~80% sand, fine to coarse, subangular to subrounded, ~20% gravel, fine, angular, trace of silt.
5	0.0	100 %	19 35 50			
10	0.0	94 %	12 47 70			Sand- Same as above with ~10% gravel and ~10% silt, some cementation.
15	0.0	100 %	12 32 46		SW	Same as above with less gravel and silt.
20	0.0	89 %	23 50 50			Same as above with ~10% cemented silt and ~5% fine gravel.
25	0.0	100 %	17 19 18		ML	Sandy Silt- Light brown, slightly moist, ~70% silt, high cementation, ~30% well graded sand.
30 ▼	0.0	100 %	5 6 7		ML	Silt- Dark brown, very moist, minimal cementation, trace of coarse sand at 30 feet.
	0.0	100 %	4 6 7			Same as above, no sand, wet.
35						End of Boring at 35 feet.
40						

DRILLING LOG 4 - ID RECOVERY BLOW COUNT Rev. 7/17/08 HUMES LOGS.GPJ SHAW IT.GDT 7/17/08

Drilling Log

Soil Boring **SB-2**

Project ER0435 Owner

Location Tronox Henderson, NV Facility Proj. No. 117604

Surface Elev. NA Total Hole Depth 35.0 ft. Lat. 36.0288 Long. 115.00186

Top of Casing NA Water Level Initial NA Static ▼ 33.5 ft. Diameter 8 in.

Screen: Dia NA Length NA Type/Size NA

Casing: Dia NA Length NA Type NA

Fill Material Rig/Core CME 95

Drill Co. WDC Method HSA

Driller Jeff Log By DGH Date 1/25/08 Permit # NA

Checked By License No.

COMMENTS
Driller reported hard material at 33.5 feet then likely into water. Bottom 6 inches of sampler was silt at 34.5 feet. Sample obtained from silt.

Depth (ft.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic Descriptions are Based on the USCS.
0						
5	0.0	100 %	14 16 27		SM	Silty Sand- Light brown, dry, ~60% sand, fine, ~40% silt, some cementation.
10	0.0	89 %	36 40 50			Same as Above.
15	0.0	100 %	14 24 29		SW	Sand, Dark brown, slightly moist, fine to coarse, subangular to subrounded, trace of fine, angular, gravel.
20	0.0	44 %	7 15 17		SW	Gravelly Sand- Dark brown, slightly moist, fine to coarse, subangular to subrounded, ~65% sand, ~35% gravel, fine, angular.
25	0.0	100 %	12 24 13		SM	Silty Sand with gravel- Dark brown, slightly moist, ~50% sand, fine to coarse, subangular to subrounded, ~30% silt, high cementation, ~20% gravel, fine, angular. Rig chattering.
30	0.0	44 %	33 50		SW	Gravelly Sand- Dark brown, moist, ~50% sand, fine to coarse, subangular to subrounded, ~50% gravel, fine, angular, some sand cementation, minimal silt.
▼	0.0	100 %	5 12 15		ML	Gravelly Sand- Wet, ~70% gravel, fine, subangular to subrounded, ~30% medium to coarse sand. (Looks like broken basalt.)
35						Silt- fairly dry, no cementation. End of Boring at 35 feet.
40						

DRILLING LOG 4 - ID RECOVERY BLOW COUNT Rev: 7/17/08 HUMES LOGS.GPJ SHAW IT.GDT 7/17/08

Drilling Log

Soil Boring **SB-3**

Project ER0435 Owner

Location Tronox Henderson, NV Facility Proj. No. 117604

Surface Elev. NA Total Hole Depth 35.0 ft. Lat. 36.0286 Long. 115.0025

Top of Casing NA Water Level Initial NA Static ▼ 32.0 ft. Diameter 8 in.

Screen: Dia NA Length NA Type/Size NA

Casing: Dia NA Length NA Type NA

Fill Material Rig/Core CME 95

Drill Co. WDC Method HSA

Driller Jeff Log By DGH/J&D Date 1/23/08 Permit # NA

Checked By License No.

COMMENTS

Depth (ft.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic Descriptions are Based on the USCS.
0						
					SP	Sand- Medium brown, fine, slightly moist, ~15% coarse sand/fine gravel, angular to subangular.
5	0.0	18 %	7 9 8			
10	0.0	18 %	11 23 30		SW	Sand- Medium brown, fine to coarse, subangular to subrounded, slightly moist, no gravel.
15	0.0	17 %	16 23 28		SP	Sand- Light brown, fine, slightly moist, ~10% cemented silt, trace of fine, subrounded gravel.
20	0.0	17 %	12 25 27		SP	As above with ~15% cemented silt.
25	0.0	14 %	36 50		SM	Silty Sand- Light brown, fine, ~20% cemented silt.
30	0.0	18 %	2 4 5		ML	Silt- Light brown, moist, trace of cementation.
▼						Groundwater estimated at 32 feet.
	0.0	18 %	5 7 8			As above, very moist.
35						End of Boring at 35 feet.
40						

DRILLING LOG 4 - ID RECOVERY BLOW COUNT Rev: 7/17/08 HUMES LOGS.GPJ SHAW IT.GDT 7/17/08

Drilling Log

Soil Boring **SB-4**

Project *ER0435* Owner

Location *Tronox Henderson, NV Facility* Proj. No. *117604*

Surface Elev. *NA* Total Hole Depth *31.0 ft.* Lat. *36.02866* Long. *115.00263*

Top of Casing *NA* Water Level Initial *NA* Static ▼ *31.0 ft.* Diameter *8 in.*

Screen: Dia *NA* Length *NA* Type/Size *NA*

Casing: Dia *NA* Length *NA* Type *NA*

Fill Material Rig/Core *CME 95*

Drill Co. *WDC* Method *HSA*

Driller *Jeff* Log By *DGH* Date *1/24/08* Permit # *NA*

Checked By License No.

COMMENTS
Continuous sampling with split spoon

Depth (ft.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic Descriptions are Based on the USCS.
0	0.0	100 %	9 14 20 25		ML	Gravelly Silt- Yellow-orange, dry, ~20% gravel, fine, subangular to angular. Some cementation.
	0.0	92 %	9 32 31 36			
	0.0	92 %	4 14 21 32			
5	0.0	92 %	4 25 36 48			
	0.0	100 %	9 21 25 23		ML	Sandy Silt- Yellow-orange, dry, ~30% sand, fine to coarse, subrounded to subangular, 20% gravel, fine, angular, some cement, few cobbles.
10	0.0	92 %	12 23 27 24		SW	Gravelly Sand- Light brown, slightly moist, ~70% sand, fine to coarse, subangular to subrounded, ~30% gravel, fine to angular.
	0.0	88 %	7 20 24 26			
	0.0	100 %	4 17 19 18			Darker color at 13 feet.
15	0.0	82 %	8 11 13 18		SW	Sand- Same as above with ~10% gravel.
	0.0	42 %	16 22 50/6"			More gravel at 17 to 17.2 feet.
20	0.0	17 %	41 50/3"		SW	Gravelly Sand with Silt- Medium brown, slightly moist, ~50% sand, fine to coarse, subrounded to subangular, ~30% gravel, fine to coarse, angular, ~20% silt, medium to high cementation.
	0.0	100 %	50/4"			
	0.0	96 %	60 50/4"		ML	Sandy Silt- Light brown, slightly moist, ~55% silt, medium to high cementation, ~45% sand, fine.
25	0.0	100 %	26 65 120 64		ML	Silt- Medium brown, moist, medium cementation.
	0.0	96 %	24 84 52 62			
	0.0	100 %	3 8 13 21			
30 ▼						Very moist at 30 feet.
						End of Boring at 31 feet.
35						

DRILLING LOG 4 - ID RECOVERY BLOW COUNT Rev: 7/17/08 HUMES LOGS.GPJ SHAW IT.GDT 7/17/08

Drilling Log

Soil Boring **SB-5**

Project ER0435 Owner

Location Tronox Henderson, NV Facility Proj. No. 117604

Surface Elev. NA Total Hole Depth 35.0 ft. Lat. 36.02866 Long. 115.00279

Top of Casing NA Water Level Initial NA Static ▼ 35.0 ft. Diameter 8 in.

Screen: Dia NA Length NA Type/Size NA

Casing: Dia NA Length NA Type NA

Fill Material Rig/Core CME 95

Drill Co. WDC Method HSA

Driller Jeff Log By DGH Date 1/24/08 Permit # NA

Checked By License No.

COMMENTS

Depth (ft.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic Descriptions are Based on the USCS.
0						Cemented Silt (Caliche)- Only two inches of recovery.
5	0.0	67 %	27 32		SW	Sand- Light brown, slightly moist, fine to coarse, subangular to subrounded, trace of cemented silt.
10	0.0	100 %	11 21 22		SW	Gravelly Sand- Light brown, slightly moist, ~65% sand, fine to coarse, subangular to subrounded, ~35% gravel, fine to coarse, subangular.
15	0.0	100 %	6 18 30		SW	Sand- Light brown, slightly moist, fine to coarse (mostly fine), ~10% gravel, fine, angular.
20	0.0	94 %	8 28 50		SM	Silty Sand- Light brown, slightly moist, ~75% sand, fine, ~25% silt, some cementation.
25	0.0	67 %	11 50			Same as Above.
30	0.0	44 %	1 50		ML	Silt- Light brown, moist, high cementation.
35 ▼	0.0	100 %	2 4 6			Same as above, slightly more moist, less cementation.
						End of Boring at 35 feet.
40						

DRILLING LOG 4 - ID RECOVERY BLOW COUNT Rev: 7/17/08 HUMES LOGS.GPJ SHAW IT.GDT 7/17/08

Drilling Log

Soil Boring **SB-6**

Project ER0435 Owner

Location Tronox Henderson, NV Facility Proj. No. 117604

Surface Elev. NA Total Hole Depth 35.0 ft. Lat. 36.75 Long. 115.208

Top of Casing NA Water Level Initial NA Static ▼ 31.0 ft. Diameter 8 in.

Screen: Dia NA Length NA Type/Size NA

Casing: Dia NA Length NA Type NA

Fill Material Rig/Core CME 95

Drill Co. WDC Method HSA

Driller Jeff Log By DGH Date 1/24/08 Permit # NA

Checked By License No.

COMMENTS

Depth (ft.)	PID (ppm)	Sample ID % Recovery	Blow Count Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Geologic Descriptions are Based on the USCS.
0						Sand- Light brown, slightly moist, fine to coarse, subrounded to subangular, trace of fine gravel.
5	0.0	100 %	29 28 28 32			
10	0.0	100 %				Same as above with coarser grains, ~20% gravel.
15	0.0	89 %	27 31 31 50		SW	Same as Above.
20	0.0	67 %	50			Same as above with ~15% gravel.
25	0.0	100 %	17 30 32			Same as above with trace of cemented silt.
30 ▼	0.0	100 %	2 6 18			Silt- Light brown, moist, some cementation.
	0.0	100 %	5 8 7		ML	Same as above with more moisture. (Not as wet as SB-3. Had to pull up auger and wait for water to come in.)
35						End of Boring at 35 feet.
40						

DRILLING LOG 4 - ID RECOVERY BLOW COUNT Rev: 7/17/08 HUMES LOGS.GPJ SHAW IT.GDT 7/17/08

Appendix B
Analytical Results

Shaw Environmental & Infrastructure, Inc.

17 Princess Road
Lawrenceville, NJ 08648
Tel: 609/895-5370
Fax: 609/895-1858

Reduced Deliverable Package

Prepared for
[redacted] ER-0345

Lab ID
7881

Project Number: 117604 010000

Samples Received
25-Jan-08

Report
7-Feb-08

NJDEP Certified Lab 11001

2/7/08

Randi K Rothmel, PhD **Date**
Laboratory Director

Table of Contents

1.0 General Information
Sample ID Table
Chain of custody
Internal chains of custody
Methodology Review
Data Reporting Qualifiers

2.0 Sample Summary Results

3.0 QA/QC Report

1.0 General Information

Chain of Custody (s)

Shaw
17 Princess Rd
Lawrenceville, NJ 08648
609-895-5370/ 609-895-1858
Shaw Environmental and Infrastructure Inc.

7881

CHAIN OF CUSTODY

Ref. Document # _____

Page 1 of 3

Project Number/Cost code: 117604 /
Project Name / Location: ER-0435 /
Purchase Order #:

Shipment Date: 1/24/08
Waybill/Airbill Number: J165 886 945 4
Lab Destination:
Lab Contact Name / ph. #: Randy Rothmel

Project Contact: Jay Diebold (Name & phone #)

Send Report To: Jay Diebold
Phone/Fax Number: 414-291-2357
Address:
City/State: Milwaukee, WI

Sampler's Name(s): Doug Hulmes / Jay Diebold

Lab No.	Sample ID Number	Sample Description	Collection Information Date	Time	G/C	Matrix	# of containers	Container size	Preservative HCL	NaOH	HNO_3	H_2SO_4	Ice		Analyses Requested: Anions	pH	Metals	Perchlorate	Total Solids			Any Additional Information	Turn Around Time Requested
1	B3-5'	Soil	1/23/08	1400	G		1	1 Liter plastic					X		X	X		X					
2	B3-10'	Soil		1415			1																
3	B3-15'			1425			1																
4	B3-20'			1435			1																
5	B3-25'			1445			1																
6	B3-30'			1450			1																
7	B3-35'			1500			1																
8	B3-water	Groundwater		1515			2	1 liter plastic + 50 mL centr. tube															

Special Instructions:

Known Waste Stream Circle:
RCRA PCB/dioxin PAH/oil RAD Corrosive Flammable Reactive
QC/Data Package Level Required:
I II III IV NJ EDD GIS EDD Preliminary data

Relinquished By:	Date: 1/24/08 Time: 1400	Received By:	Date: 1/25/08 Time: 1200
Relinquished By:	Date: Time:	Received By:	Date: Time:
Relinquished By:	Date: Time:	Received By:	Date: Time:

G/C Codes
C = Composite G = Grab
all Grab samples

QC Package Codes
Level I = data summary
Level II = data summary + basic QC
Level III = New Jersey QC reduced deliverable
Level IV = Full deliverable CLP package

Cooler temperature upon arrival at Lab:

000000

Shaw
17 Princess Rd
Lawrenceville, NJ 08648
609-895-5370/ 609-895-1858
Shaw Environmental and Infrastructure Inc.

CHAIN OF CUSTODY

Ref. Document # _____

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7881

Project Contact: Jay Diebold (Name & phone #)

Send Report To: Jay Diebold
Phone/Fax Number: 414-291-2357
Address:
City/State: Milwaukee, WI

Sampler's Name(s): Doug Hylmer / Jay Diebold

Project Number/Cost code: 117604 /
Project Name / Location: ER-0435 /
Purchase Order #:

Shipment Date: 1/24/08
Waybill/Airbill Number:
Lab Destination:
Lab Contact Name / ph. #: Randy Rothmel

Lab No.	Sample ID Number	Sample Description	Collection Information Date	Time	G/C	Matrix	# of containers	Container size	HCL	NaOH	HNO_3	H_2SO_4	Ice		Anions	pH	Metals	Perchlorate	Total Solids			Any Additional Information	Turn Around Time Requested
9	B6-5'	Soil	1/23/08	1645	G		1	1L plastic					X		X	X	X						
10	B6-10'		1/23/08	1655			1																
11	B6-15'		1/24/08	0750			1																
12	B6-20'			0800			1																
13	B6-25'			0820			1																
14	B6-30'			0835			1																
15	B6-35'			0845			1																
16	B6-water	Groundwater		0850			2	1L plastic + 50ml cent. tube															

Special Instructions:

Known Waste Stream Circle:
RCRA PCB/dioxin PAH/oil RAD Corrosive Flammable Reactive

QC/Data Package Level Required:
I II III IV NJ EDD GIS EDD Preliminary data

Relinquished By: Doug Hylmer Date: 1/24/08 Time:
Received By: Date: Time:
Relinquished By: Date: Time:
Received By: Date: Time:
Relinquished By: Date: Time:
Received By: Date: Time:

G/C Codes
C = Composite G = Grab

QC Package Codes
Level I = data summary
Level II = data summary + basic QC
Level III = New Jersey QC reduced deliverable
Level IV = Full deliverable CLP package

Cooler temperature upon arrival at Lab:

000008

COC Continuation Page

Shaw
Shaw Environmental and Infrastructure Inc.

COC Ref. Document # _____

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7881

Project Number/ cost code: 117604 1

Shipment Date: 11/24/08

Project Name / Location: ER-0435

Lab No.	Sample ID Number	Sample Description	Collection Information Date	Time	G/C	Matrix	# of containers	Container size	Preservative HCL	NaOH	HNO_3	H_2SO_4	Ice		Arsenic	pH	Moisture	Perchlorate	Total Solids				Any Additional Information	Turn Around Time Requested
17	B5-5.5'	Soil	11/24/08	1040	G		1	1L plastic					X		✓	✓	✓	✓	✓					
18	B5-10'	↓	↓	1045	↓		1						↓		↓	↓	↓	↓	↓					
19	B5-15'	↓	↓	1055	↓		1						↓		↓	↓	↓	↓	↓					
20	B5-20'	↓	↓	1105	↓		1						↓		↓	↓	↓	↓	↓					

Analyses Requested

000047

Lab ID 7881
Client: Shaw ER-0435
Date Received: 1-25-08

Shaw E&I Analytical and Treatability Laboratories Internal Chain of Custody

Pg _____ of _____

Sample ID	Parameter	Bottle Type	Perservative	Date/Time Removed	Relinquishing Custodian Initials	Receiving Analyst Initials	Date/Time Returned	Receiving Custodian Initials	Relinquishing Analyst Initials
1	pH	1L	np	1/30/08 8:00	[illegible]	[illegible]	1/30/08 10:12	[illegible]	[illegible]
10									
20									
1	anions	1L	np	1/30/08 1800	[illegible]	PM	1/30/08 1800	[illegible]	PM
10									
20									

000008

Lab ID 7831

Client:

Date Received:

Shaw E&I Analytical and Treatability Laboratories Internal Chain of Custody

Pg _____ of _____

Sample ID	Parameter	Bottle Type	Perservative	Date/Time Removed	Relinquishing Custodian Initials	Receiving Analyst Initials	Date/Time Returned	Receiving Custodian Initials	Relinquishing Analyst Initials
1	metals	IL	HNO3						
10				SUB					
20				SUB					
1	Total solids			1/30/08 10:30	RM	[illegible]	1/30/08 10:00	RM	[illegible]
20									

600009

Methodology Review

Volatile Organics

Unless otherwise specified, water samples are analyzed for volatile organics by purge and trap GC/MS as specified in EPA Method 8260b. Soil samples are prepared by 5035- methanol extraction prior to analysis by 5030. GC/MS nontargeted compounds are analyzed for only upon request using a library search of the EPA/NIST98 mass spectral library of compounds at the greatest apparent concentrations (>10%of the nearest internal standard) for a total of 15 hits.

Other Organics

Other Organics such as tertbutyl alcohol, and dissolved gases (methane,ethane, ethene, propane) are analyzed using modified EPA method RSK-175/8015 unless specified. Dissolved Hydrogen is analysed by RSK-175 using a GC equiped with a PDHID detector. Dissolved gases are prepared by a modification of Kampbell, and Vandegrift(Journal of Chromatographic Science, 1998, Vol 38, p253-256. Volatile fatty acids (acetate, formate, butyrate, proprionate) are analyzed by ion chromatography. Nitroaromatics are analyzed using Method 8330.

All Microbiogy and Inorganic analysis is done by standard methods as specified in Test Method for Evaluating Solid Wastes, SW846, on line methods; EPA methods and Guidance of Analysis of Water, 1999; or Standard Methods for the examination of Water and Wastewater, 18/19th ed.

Microbiology

Parameter	Method Code (s)	
Total Heterotrophs	SM9215C	
Specific Heterotrophs	SM9215C-BSM	
Biological Oxygen Demand	EPA405.1	
Biological Oxygen Demand, Carbon	SM5210B	

Wet Chemistry -Inorganics

Anions (chloride, nitrite,bromide, nitrate as N, nitrate as N phosphate as P,ortho, sulfate as SO4	EPA300.0	
Perchlorate,sol	EPA314.0	
Chlorate,sol	EPA300.0m	
Ammonia as NH3-N	EPA350.2	
TKN	EPA351.3	
Alkalinity as CaCO3	EPA310.1	
Hardness as CaCO3	EPA130.2	
Carbon Dioxide	SM4500-CO2	
Total Organic Carbon	EPA415.1	SW-846 9060
Chemical Oxygen Demand	EPA410.4	SM5220D
pH	EPA150.1	SW-846 9045C
Total Dissolved Solids (TDS)	EPA160.1	
Total Solids	EPA160.3	SM2540G
Total Suspended Solids (TSS)	EPA160.2	
Volatile Suspended Solids (VSS)	EPA160.4	SM2540G
Conductivity	EPA120.1	SW-846 9050A
Phosphorus (all forms)	EPA365.2	
Sulfide	EPA376.2	SM4500-S D
Total Resdual Chlorine	EPA330.5	SM4500-Cl G

Reporting Qualifiers

U- The compound was not detected at the indicated PQL concentration.

J- Approximate concentration of the compound. Detection of compound above calculated MDL but below the PQL of the analytical method. 99% confidence that the compound is present.

D- Diluted sample

B- The analyte was observed in laboratory blank as well as the sample - for EPA SW856 8260b and EPA 624 analysis

E- Compound detected above the linear range of the curve. Value given is an estimated value.

2.0 Sample Results

Shaw Environmental
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Sample Information			
Lab ID	**7881-1**	**Date Sampled**	01/23/2008
Sample ID	**B3-5'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	4.43	D	mg/Kg	1.09	0.232	10	EPA 300.0
Chloride	01/30/2008	12.7	D	mg/Kg	1.09	0.222	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.09	1.778	10	EPA 300.0
Sulfate as SO4	01/30/2008	183	D	mg/Kg	1.09	0.170	10	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.09	0.312	10	EPA 300.0
Nitrate as N	01/30/2008	5.1	D	mg/Kg	1.09	0.106	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.09	0.186	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	13.6	D	mg/Kg	1.09	0.253	10	EPA 300.0
pH	01/30/2008	9.26		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	34,100	D	ug/Kg	545	83.6	1,000	EPA 314.0
Total Solids	01/30/2008	91.7		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
(1) Not listed as a Shaw Certified paramaters under the NJDEP lab certification program.
(2) Not available as a certified parameter under the NJDEP lab certification program.
(.) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-2**	**Date Sampled**	01/23/2008
Sample ID	**B3-10'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	5.21	D	mg/Kg	1.09	0.233	10	EPA 300.0
Chloride	01/30/2008	14.4	D	mg/Kg	1.09	0.223	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.09	1.781	10	EPA 300.0
Sulfate as SO4	01/30/2008	92.3	D	mg/Kg	1.09	0.170	10	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.09	0.313	10	EPA 300.0
Nitrate as N	01/30/2008	6.48	D	mg/Kg	1.09	0.106	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.09	0.187	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	3.19	D	mg/Kg	1.09	0.254	10	EPA 300.0
pH	01/30/2008	9.05		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	31,900	D	ug/Kg	546	83.8	1,000	EPA 314.0
Total Solids	01/30/2008	91.5		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-3**	**Date Sampled**	01/23/2008
Sample ID	**B3-15'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concen tration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	6.72	D	mg/Kg	1.12	0.239	10	EPA 300.0
Chloride	01/30/2008	18.9	D	mg/Kg	1.12	0.229	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.12	1.827	10	EPA 300.0
Sulfate as SO4	02/07/2008	15,400	D	mg/Kg	112.11	17.489	1,000	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.12	0.321	10	EPA 300.0
Nitrate as N	01/30/2008	2.40	D	mg/Kg	1.12	0.109	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.12	0.192	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.12	0.260	10	EPA 300.0
pH	01/30/2008	8.26		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	35,900	D	ug/Kg	561	86.0	1,000	EPA 314.0
Total Solids	01/30/2008	89.2		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-4**	**Date Sampled**	01/23/2008
Sample ID	**B3-20'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	8.05	D	mg/Kg	1.11	0.237	10	EPA 300.0
Chloride	01/30/2008	26.6	D	mg/Kg	1.11	0.227	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.11	1.813	10	EPA 300.0
Sulfate as SO4	02/07/2008	9,500	D	mg/Kg	111.23	17.353	1,000	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.11	0.318	10	EPA 300.0
Nitrate as N	01/30/2008	3.20	D	mg/Kg	1.11	0.108	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.11	0.190	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.11	0.258	10	EPA 300.0
pH	01/30/2008	8.49		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	22,600	D	ug/Kg	556	85.3	1,000	EPA 314.0
Total Solids	01/30/2008	89.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-5**	**Date Sampled**	01/23/2008
Sample ID	**B3-25'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concen tration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	25.7	D	mg/Kg	1.20	0.257	10	EPA 300.0
Chloride	01/30/2008	51.7	D	mg/Kg	1.20	0.246	10	EPA 300.0
Nitrite as N	01/30/2008	1.2	U	mg/Kg	1.20	1.964	10	EPA 300.0
Sulfate as SO4	02/07/2008	1,160	D	mg/Kg	12.05	1.880	100	EPA 300.0
Bromide	01/30/2008	1.2	U	mg/Kg	1.20	0.345	10	EPA 300.0
Nitrate as N	01/30/2008	30.2	D	mg/Kg	1.20	0.117	10	EPA 300.0
Chlorate	01/30/2008	1.2	U	mg/Kg	1.20	0.206	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.2	U	mg/Kg	1.20	0.280	10	EPA 300.0
pH	01/30/2008	8.52		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	59,900	D	ug/Kg	602	92.4	1,000	EPA 314.0
Total Solids	01/30/2008	83.0		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
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Sample Information			
Lab ID	**7881-6**	**Date Sampled**	01/23/2008
Sample ID	**B3-30'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	10.4	D	mg/Kg	1.62	0.345	10	EPA 300.0
Chloride	02/07/2008	434	D	mg/Kg	16.18	3.301	100	EPA 300.0
Nitrite as N	01/30/2008	5.61	D	mg/Kg	1.62	2.638	10	EPA 300.0
Sulfate as SO4	02/07/2008	850	D	mg/Kg	16.18	2.524	100	EPA 300.0
Bromide	01/30/2008	1.6	U	mg/Kg	1.62	0.463	10	EPA 300.0
Nitrate as N	01/30/2008	21.3	D	mg/Kg	1.62	0.157	10	EPA 300.0
Chlorate	01/30/2008	7.41	D	mg/Kg	1.62	0.277	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.6	U	mg/Kg	1.62	0.375	10	EPA 300.0
pH	01/30/2008	8.64		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	549,000	D	ug/Kg	4,045	620.6	5,000	EPA 314.0
Total Solids	01/30/2008	61.8		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-7**	**Date Sampled**	01/23/2008
Sample ID	**B3-35'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	12.5	D	mg/Kg	1.60	0.341	10	EPA 300.0
Chloride	02/07/2008	546	D	mg/Kg	16.03	3.269	100	EPA 300.0
Nitrite as N	01/30/2008	9.92	D	mg/Kg	1.60	2.612	10	EPA 300.0
Sulfate as SO4	02/07/2008	928	D	mg/Kg	16.03	2.500	100	EPA 300.0
Bromide	01/30/2008	1.6	U	mg/Kg	1.60	0.458	10	EPA 300.0
Nitrate as N	01/30/2008	23.4	D	mg/Kg	1.60	0.155	10	EPA 300.0
Chlorate	01/30/2008	9.31	D	mg/Kg	1.60	0.274	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.6	U	mg/Kg	1.60	0.372	10	EPA 300.0
pH	01/30/2008	8.87		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	667,000	D	ug/Kg	8,013	1,229.2	10,000	EPA 314.0
Total Solids	01/30/2008	62.4		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-8**	**Date Sampled**	01/23/2008
Sample ID	**B3-water**	**Date Received**	01/25/2008
Matrix	***Aqueous***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	0.77		mg/L	0.10	0.021	1	EPA 300.0
Chloride	02/07/2008	915	D	mg/L	10.00	2.040	100	EPA 300.0
Nitrite as N	01/30/2008	6.08		mg/L	0.10	0.163	1	EPA 300.0
Sulfate as SO4	02/07/2008	1,310	D	mg/L	2.00	0.312	20	EPA 300.0
Bromide	01/30/2008	0.1	U	mg/L	0.10	0.029	1	EPA 300.0
Nitrate as N	01/30/2008	40.1	D	mg/L	2.00	0.194	20	EPA 300.0
Chlorate	01/30/2008	25.8		mg/L	0.10	0.017	1	EPA 300.0
Phosphate as P, ortho	01/30/2008	0.1	U	mg/L	0.10	0.023	1	EPA 300.0
pH	01/30/2008	7.48		SU	NA	NA	1	EPA 150.1
Perchlorate,sol	01/31/2008	1,150,000	D	ug/L	5,000	767	10,000	EPA 314.0

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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-9**	**Date Sampled**	01/23/2008
Sample ID	**B6-5'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concen tration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	2.11	D	mg/Kg	1.11	0.237	10	EPA 300.0
Chloride	01/30/2008	9.40	D	mg/Kg	1.11	0.227	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.11	1.811	10	EPA 300.0
Sulfate as SO4	02/07/2008	1,660	D	mg/Kg	11.11	1.733	100	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.11	0.318	10	EPA 300.0
Nitrate as N	01/30/2008	1.1	U	mg/Kg	1.11	0.108	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.11	0.190	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.11	0.258	10	EPA 300.0
pH	01/30/2008	9.03		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	5,390	D	ug/Kg	556	85.2	1,000	EPA 314.0
Total Solids	01/30/2008	90.0		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-10**	**Date Sampled**	01/23/2008
Sample ID	**B6-10'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	4.31	D	mg/Kg	1.09	0.232	10	EPA 300.0
Chloride	01/30/2008	2.26	D	mg/Kg	1.09	0.222	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.09	1.774	10	EPA 300.0
Sulfate as SO4	02/07/2008	493	D	mg/Kg	10.88	1.697	100	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.09	0.311	10	EPA 300.0
Nitrate as N	01/30/2008	1.1	U	mg/Kg	1.09	0.106	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.09	0.186	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.09	0.252	10	EPA 300.0
pH	01/30/2008	9.43		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	2,090	D	ug/Kg	54	8.3	100	EPA 314.0
Total Solids	01/30/2008	91.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
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Fax: 609/895-1858

Sample Information			
Lab ID	**7881-11**	**Date Sampled**	01/24/2008
Sample ID	**B6-15'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	3.92	D	mg/Kg	1.10	0.233	10	EPA 300.0
Chloride	01/30/2008	13.3	D	mg/Kg	1.10	0.223	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.10	1.785	10	EPA 300.0
Sulfate as SO4	02/07/2008	11,040	D	mg/Kg	109.53	17.087	1,000	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.10	0.313	10	EPA 300.0
Nitrate as N	01/30/2008	1.07	JD	mg/Kg	1.10	0.106	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.10	0.187	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.10	0.254	10	EPA 300.0
pH	01/30/2008	8.65		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	8,420	D	ug/Kg	55	8.4	100	EPA 314.0
Total Solids	01/30/2008	91.3		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-12**	**Date Sampled**	01/24/2008
Sample ID	**B6-20'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	3.89	D	mg/Kg	1.12	0.240	10	EPA 300.0
Chloride	01/30/2008	21.0	D	mg/Kg	1.12	0.229	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.12	1.834	10	EPA 300.0
Sulfate as SO4	02/07/2008	18,300	D	mg/Kg	112.49	17.548	1,000	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.12	0.322	10	EPA 300.0
Nitrate as N	01/30/2008	4.79	D	mg/Kg	1.12	0.109	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.12	0.192	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.12	0.261	10	EPA 300.0
pH	01/30/2008	8.45		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	46,000	D	ug/Kg	281	43.1	500	EPA 314.0
Total Solids	01/30/2008	88.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-13**	**Date Sampled**	01/24/2008
Sample ID	**B6-25'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	9.47	D	mg/Kg	1.13	0.240	10	EPA 300.0
Chloride	01/30/2008	61.5	D	mg/Kg	1.13	0.230	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.13	1.840	10	EPA 300.0
Sulfate as SO4	02/07/2008	5,070	D	mg/Kg	112.87	17.607	1,000	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.13	0.323	10	EPA 300.0
Nitrate as N	01/30/2008	10.0	D	mg/Kg	1.13	0.109	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.13	0.193	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.13	0.262	10	EPA 300.0
pH	01/30/2008	8.60		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	110,000	D	ug/Kg	564	86.6	1,000	EPA 314.0
Total Solids	01/30/2008	88.6		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7881-14**	**Date Sampled**	01/24/2008
Sample ID	**B6-30'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concen tration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	11.1	D	mg/Kg	1.76	0.376	10	EPA 300.0
Chloride	01/30/2008	480	D	mg/Kg	1.76	0.360	10	EPA 300.0
Nitrite as N	01/30/2008	1.8	U	mg/Kg	1.76	2.875	10	EPA 300.0
Sulfate as SO4	02/07/2008	944	D	mg/Kg	17.64	2.751	100	EPA 300.0
Bromide	01/30/2008	1.8	U	mg/Kg	1.76	0.504	10	EPA 300.0
Nitrate as N	01/30/2008	6.63	D	mg/Kg	1.76	0.171	10	EPA 300.0
Chlorate	01/30/2008	1.8	U	mg/Kg	1.76	0.302	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.8	U	mg/Kg	1.76	0.409	10	EPA 300.0
pH	01/30/2008	8.64		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	19,700	D	ug/Kg	441	67.6	500	EPA 314.0
Total Solids	01/30/2008	56.7		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(U) Compound not detected above method practical quantitation limit.
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(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	7881-15	Date Sampled	01/24/2008
Sample ID	B6-35'	Date Received	01/25/2008
Matrix	*Soil*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concen tration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	10.5	D	mg/Kg	1.76	0.375	10	EPA 300.0
Chloride	01/30/2008	479	D	mg/Kg	1.76	0.359	10	EPA 300.0
Nitrite as N	01/30/2008	1.8	U	mg/Kg	1.76	2.870	10	EPA 300.0
Sulfate as SO4	02/07/2008	1,050	D	mg/Kg	17.61	2.746	100	EPA 300.0
Bromide	01/30/2008	1.8	U	mg/Kg	1.76	0.504	10	EPA 300.0
Nitrate as N	01/30/2008	5.61	D	mg/Kg	1.76	0.171	10	EPA 300.0
Chlorate	01/30/2008	1.8	U	mg/Kg	1.76	0.301	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.8	U	mg/Kg	1.76	0.408	10	EPA 300.0
pH	01/30/2008	8.99		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	26,600	D	ug/Kg	440	67.5	500	EPA 314.0
Total Solids	01/30/2008	56.8		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(U) Compound not detected above method practical quantitation limit.
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(J) Estimated value above MDL and less than PQL
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Sample Information			
Lab ID	**7881-16**	**Date Sampled**	01/24/2008
Sample ID	**B6-water**	**Date Received**	01/25/2008
Matrix	***Aqueous***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	0.41		mg/L	0.10	0.021	1	EPA 300.0
Chloride	02/07/2008	796	D	mg/L	10.00	2.040	100	EPA 300.0
Nitrite as N	01/30/2008	0.1	U	mg/L	0.10	0.163	1	EPA 300.0
Sulfate as SO4	02/07/2008	1,340	D	mg/L	10.00	1.560	100	EPA 300.0
Bromide	01/30/2008	0.1	U	mg/L	0.10	0.029	1	EPA 300.0
Nitrate as N	01/30/2008	10.5		mg/L	0.10	0.010	1	EPA 300.0
Chlorate	01/30/2008	17.5		mg/L	0.10	0.017	1	EPA 300.0
Phosphate as P, ortho	01/30/2008	0.1	U	mg/L	0.10	0.023	1	EPA 300.0
pH	01/30/2008	7.76		SU	NA	NA	1	EPA 150.1
Perchlorate,sol	01/31/2008	42,300	D	ug/L	2,500	384	5,000	EPA 314.0

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(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	7881-17	Date Sampled	01/24/2008
Sample ID	B5-5.5'	Date Received	01/25/2008
Matrix	*Soil*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concen tration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	6.24	D	mg/Kg	1.11	0.237	10	EPA 300.0
Chloride	01/30/2008	12.0	D	mg/Kg	1.11	0.227	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.11	1.811	10	EPA 300.0
Sulfate as SO4	01/30/2008	189	D	mg/Kg	1.11	0.173	10	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.11	0.318	10	EPA 300.0
Nitrate as N	01/30/2008	1.21	D	mg/Kg	1.11	0.108	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.11	0.190	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.11	0.258	10	EPA 300.0
pH	01/30/2008	9.49		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	5,410	D	ug/Kg	278	42.6	500	EPA 314.0
Total Solids	01/30/2008	90.0		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(J) Estimated value above MDL and less than PQL
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Sample Information			
Lab ID	**7881-18**	**Date Sampled**	01/24/2008
Sample ID	**B5-10'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	5.31	D	mg/Kg	1.11	0.236	10	EPA 300.0
Chloride	01/30/2008	18.7	D	mg/Kg	1.11	0.226	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.11	1.809	10	EPA 300.0
Sulfate as SO4	01/30/2008	207	D	mg/Kg	1.11	0.173	10	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.11	0.317	10	EPA 300.0
Nitrate as N	01/30/2008	2.20	D	mg/Kg	1.11	0.108	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.11	0.190	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.11	0.257	10	EPA 300.0
pH	01/30/2008	9.59		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	13,900	D	ug/Kg	277	42.6	500	EPA 314.0
Total Solids	01/30/2008	90.1		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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Sample Information			
Lab ID	**7881-19**	**Date Sampled**	01/24/2008
Sample ID	**B5-15'**	**Date Received**	01/25/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concen tration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	4.18	D	mg/Kg	1.09	0.232	10	EPA 300.0
Chloride	01/30/2008	52.8	D	mg/Kg	1.09	0.222	10	EPA 300.0
Nitrite as N	01/30/2008	1.1	U	mg/Kg	1.09	1.772	10	EPA 300.0
Sulfate as SO4	02/07/2008	3,910	D	mg/Kg	21.74	3.391	200	EPA 300.0
Bromide	01/30/2008	1.1	U	mg/Kg	1.09	0.311	10	EPA 300.0
Nitrate as N	01/30/2008	10.9	D	mg/Kg	1.09	0.105	10	EPA 300.0
Chlorate	01/30/2008	1.1	U	mg/Kg	1.09	0.186	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.1	U	mg/Kg	1.09	0.252	10	EPA 300.0
pH	01/30/2008	8.85		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	01/31/2008	80,400	D	ug/Kg	272	41.7	500	EPA 314.0
Total Solids	01/30/2008	92.0		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(U) Compound not detected above method practical quantitation limit.
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Sample Information			
Lab ID	7881-20	Date Sampled	01/24/2008
Sample ID	B5-20'	Date Received	01/25/2008
Matrix	*Soil*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/30/2008	12.4	D	mg/Kg	1.19	0.253	10	EPA 300.0
Chloride	01/30/2008	109	D	mg/Kg	1.19	0.243	10	EPA 300.0
Nitrite as N	01/30/2008	1.2	U	mg/Kg	1.19	1.938	10	EPA 300.0
Sulfate as SO4	02/07/2008	13,100	D	mg/Kg	118.91	18.549	1,000	EPA 300.0
Bromide	01/30/2008	1.2	U	mg/Kg	1.19	0.340	10	EPA 300.0
Nitrate as N	01/30/2008	29.5	D	mg/Kg	1.19	0.115	10	EPA 300.0
Chlorate	01/30/2008	1.2	U	mg/Kg	1.19	0.203	10	EPA 300.0
Phosphate as P, ortho	01/30/2008	1.2	U	mg/Kg	1.19	0.276	10	EPA 300.0
pH	01/30/2008	8.27		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	213,100	D	ug/Kg	2,973	456.0	5,000	EPA 314.0
Total Solids	01/30/2008	84.1		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(E) Estimated value beyond linear range

3.0 QC Summary

Sample Batch:Perchlorate

Lab ID	Analysis dates	
7881- 1	1/31/2008	2/4/2008
7881- 2	1/31/2008	2/4/2008
7881- 3	1/31/2008	
7881- 4	1/31/2008	
7881- 5	1/31/2008	
7881- 6	1/31/2008	
7881- 7	1/31/2008	2/4/2008
7881- 8	1/31/2008	
7881- 9	1/31/2008	
7881- 10	1/31/2008	2/4/2008
7881- 11	1/31/2008	2/4/2008
7881- 12	1/31/2008	
7881- 13	1/31/2008	2/4/2008
7881- 14	1/31/2008	
7881- 15	1/31/2008	
7881- 16	1/31/2008	
7881- 17	1/31/2008	
7881- 18	1/31/2008	
7881- 19	1/31/2008	
7881- 20	1/31/2008	2/4/2008

Initial Calibration Summary:ClO4

Calibration Standard recoveries:

	Initial Calibration Date:	10/31/2007	
Sample:	Std ppb	observed ppb	% recovery
cal standard	0.5	0.635	127.0
cal standard	1	1.08	108.0
cal standard	5	4.72	94.4
cal standard	20	20.7	103.5
cal standard	50	48.9	97.8
cal standard	100	100.5	100.5
cal standard	200	199.9	100.0
		r2=	0.99990

QCCheck Date: 10/31/2007

Sample:	Std ppB	observed ppb	% recovery	Control Limits
QC Check	10.0	9.5	95.0	80.0-120.0%

Method Blank Summary:ClO4

Sample	Date	Concentration	Units	PQL
Blank	10/31/2007	u	ppb	1.0

u: Compound not detected above Practical Quantitation Limit (PQL).

Calibration Verification Summary:Perchlorate

Check Standard recoveries:

Sample:	Date	Std ppb	observed ppb	% recovery
check standard	1/31/2008	20	17.2	86.0
	1/31/2008	50	45.6	91.2
	2/4/2008	20	17.9	89.5
	2/4/2008	50	45.5	91.0
			Control Limits:	73.9-119.7

QC Check:

Sample:	Date	Std ppb	observed ppb	% recovery
QC Check	1/31/2008	10.5	11.03	105.0
			Control Limits:	73.9-119.7

Method Blank Summary:Perchlorate

Sample	Date	Concentration	Units	PQL
Blank	1/31/2008	u	ug/L	1.0
Blank	2/4/2008	u	ug/L	1.0

u: Compound not detected above Practical Quantitation Limit (PQL).

Instrument Preformance Summary:Perchlorate

Sample	Date	Std ppb	observed ppb	% recovery
IPC	1/31/2008	20	20.2	101.0
IPC	2/4/2008	20	19.4	97.0
			Control Limits:	66.3-111.7

Method Duplicates Summary:Perchlorate

Sample:

	Date	MS Result	MSD Result	Units
Batch MS/MSD 7881-8	1/31/2008	1,334,480.00	1,333,900.00	mg/L
		RPD=	0.0%	
		% Max RPD=	6.4%	
Batch MS/MSD 7886-9	2/4/2008	303,253.00	301,178.00	mg/L
		RPD=	0.7%	
		% Max RPD=	6.4%	

Method Spike Summary:Perchlorate

Sample:

	Date	MS Recovery	MSD Recovery	Control Limits
Batch MS/MSD	1/31/2008	121.9%	121.9%	93.9-113.9%
Batch MS/MSD	2/4/2008	96.0%	93.9%	93.9-113.9%

Sample Batch: Anions

Lab ID	Analysis date	
7881- 1	1/30/2008	
7881- 2	1/30/2008	
7881- 3	1/30/2008	2/7/2008
7881- 4	1/30/2008	2/7/2008
7881- 5	1/30/2008	2/7/2008
7881- 6	1/30/2008	2/7/2008
7881- 7	1/30/2008	2/7/2008
7881- 8	1/30/2008	2/7/2008
7881- 9	1/30/2008	2/7/2008
7881- 10	1/30/2008	2/7/2008
7881- 11	1/30/2008	2/7/2008
7881- 12	1/30/2008	2/7/2008
7881- 13	1/30/2008	2/7/2008
7881- 14	1/30/2008	2/7/2008
7881- 15	1/30/2008	2/7/2008
7881- 16	1/30/2008	2/7/2008
7881- 17	1/30/2008	
7881- 18	1/30/2008	
7881- 19	1/30/2008	2/7/2008
7881- 20	1/30/2008	2/7/2008

Initial Calibration Summary: Anions

Calibration Standard recoveries:

Initial Calibration Date: 12/27/2007

Sample:							
Std ppm		0.1	0.5	2.0	5.0	20.0	R^2=
Fluoride		0.091	0.508	2.086	5.210	19.700	
	%rec	91	101.54	104.3	104.2	20.345	0.99580
Chloride		0.0698	0.438	1.720	4.520	20.3	
	%rec	69.8	87.6	86	90.4	101.5	0.99960
Nitrite		0.082	0.472	1.990	5.060	19.860	
	%rec	81.5	94.38	99.5	101.2	99.3	0.99990
Sulfate		0.0539	0.353	1.640	4.398	20.400	
	%rec	53.9	70.66	82	87.96	102	0.99930
Bromide		0.056	0.414	1.715	4.418	20.390	
	%rec	56	82.8	85.75	88.36	101.95	0.99930
Nitrate		0.074	0.413	1.749	4.613	20.230	
	%rec	74	82.54	87.5	92.26	101.15	0.99970
Chlorate		0.059	0.368	1.629	4.326	20.450	
	%rec	59	73.56	81.45	86.52	102.25	0.99910
Phosphate		0.141	0.809	2.170	5.055	19.900	
	%rec	141	161.8	108.5	101.1	99.5	0.99990

QC Check Date: 12/27/2007

Sample:	Std ppm	Obs ppm	% recovery	Control Limits
QC Check-Fluoride	10.0	10.7	1044.0	80.0-120.0%
QC Check-Chloride	10.0	9.98	9.7	80.0-120.0%
QC Check-Nitrite	10.0	10.49	10.2	80.0-120.0%
QC Check-Sulfate	10.0	9.916	9.6	80.0-120.0%
QC Check-Bromide	10.0	9.902	9.8	80.0-120.0%
QC Check-Nitrate	10.0	9.933	9.5	80.0-120.0%
QC Check-Chlorate	10.0	9.862	10.3	80.0-120.0%
QC Check-Phosphate	10.0	10.05	100.5	80.0-120.0%

Method Blank Summary: Anions

Sample	Date	Concentration	Units	PQL
Blank-Fluoride	12/27/2007	u	ppm	0.2
Blank-Chloride	12/27/2007	u	ppm	0.2
Blank-Nitrite	12/27/2007	u	ppm	0.2
Blank-Sulfate	12/27/2007	u	ppm	0.2
Blank-Bromide	12/27/2007	u	ppm	0.2
Blank-Nitrate	12/27/2007	u	ppm	0.2
Blank-Chlroate	12/27/2007	u	ppm	0.2
Blank-Phosphate	12/27/2007	u	ppm	0.2

Calibration Verification Summary: Anions

Check Standard recoveries:

Sample:	Date	Std ppm	Obs ppm	% recovery
Fluoride check	1/30/2008	5.00	5.3	105.6
			Control Limits: 98.6-121.8	
Chloride check	1/30/2008	5.00	4.7	93.4
			Control Limits: 81.8-110.9	
Nitrite check	1/30/2008	5.00	5.24	104.8
			Control Limits: 80.8-128.5	
Sulfate check	1/30/2008	5.00	4.82	96.4
			Control Limits: 80.5-122.3	
Bromide check	1/30/2008	5.00	4.6	91.2
			Control Limits: 75.6-109.2	
Nitrate check	1/30/2008	5.00	4.8	95.4
			Control Limits: 82.2-117.5	
Chlorate check	1/30/2008	5.00	5.01	100.2
			Control Limits: 73.0-108.3	
Phosphate check	1/30/2008	5.00	5.42	108.4
			Control Limits: 80.2-120.9	

QC Check:

Sample:	Date	Std ppm	Obs ppm	% recovery
QC Check-Fluoride	1/30/2008	25.0	26.0	103.9
QC Check-Chloride	1/30/2008	50.0	49.6	99.2
QC Check-Nitrite	1/30/2008	15.0	16.05	107.0
QC Check-Sulfate	1/30/2008	50.0	469.1	938.2
QC Check-Bromide	1/30/2008	50.0	48.3	96.6
QC Check-Nitrate	1/30/2008	11.0	10.4	94.1
QC Check-Phosphate	1/30/2008	16.0	17.17	107.3

Control Limits: 80.0-120.0%

Method Blank Summary: Anions

Sample	Date	Concentration	Units	PQL
Blank-Fluoride	1/30/2008	u	ppm	0.2
Blank-Chloride	1/30/2008	u	ppm	0.2
Blank-Nitrite	1/30/2008	u	ppm	0.2
Blank-Sulfate	1/30/2008	u	ppm	0.2
Blank-Bromide	1/30/2008	u	ppm	0.2
Blank-Nitrate	1/30/2008	u	ppm	0.2
Blank-Chlroate	1/30/2008	u	ppm	0.2
Blank-Phosphate	1/30/2008	u	ppm	0.2

u: Compound not detected above Practical Quantitation Limit (PQL).

Calibration Verification Summary: Anions

Check Standard recoveries:

Sample:	Date	Std ppm	Obs ppm	% recovery
Fluoride check	2/7/2008	5.00	5.47	109.4
			Control Limits: 98.6-121.8	
Chloride check	2/7/2008	5.00	5.55	111.0
			Control Limits: 81.8-110.9	
Nitrite check	2/7/2008	5.00	5.21	104.2
			Control Limits: 80.8-128.5	
Sulfate check	2/7/2008	5.00	5.76	115.2
			Control Limits: 80.5-122.3	
Bromide check	2/7/2008	5.00	5.60	112.0
			Control Limits: 75.6-109.2	
Nitrate check	2/7/2008	5.00	5.44	108.8
			Control Limits: 82.2-117.5	
Chlorate check	2/7/2008	5.00	5.72	114.4
			Control Limits: 73.0-108.3	
Phosphate check	2/7/2008	5.00	6.02	120.4
			Control Limits: 80.2-120.9	

QC Check:

Sample:	Date	Std ppm	Obs ppm	% recovery
QC Check-Fluoride	2/7/2008	25.0	27.5	110.0
QC Check-Chloride	2/7/2008	50.0	56.05	112.1
QC Check-Nitrite	2/7/2008	15.0	16.73	111.5
QC Check-Sulfate	2/7/2008	50.0	55.8	111.5
QC Check-Bromide	2/7/2008	50.0	56.9	113.9
QC Check-Nitrate	2/7/2008	11.0	12.5	113.2
QC Check-Phosphate	2/7/2008	16.0	17.47	109.2

Control Limits: 80.0-120.0%

Method Blank Summary: Anions

Sample	Date	Concentration	Units	PQL
Blank-Fluoride	2/7/2008	u	ppm	0.2
Blank-Chloride	2/7/2008	u	ppm	0.2
Blank-Nitrite	2/7/2008	u	ppm	0.2
Blank-Sulfate	2/7/2008	u	ppm	0.2
Blank-Bromide	2/7/2008	u	ppm	0.2
Blank-Nitrate	2/7/2008	u	ppm	0.2
Blank-Chlroate	2/7/2008	u	ppm	0.2
Blank-Phosphate	2/7/2008	u	ppm	0.2

u: Compound not detected above Practical Quantitation Limit (PQL).

Method Duplicates Summary: Anions

Sample:	Batch MS/MSD	7881-20			
	Date	MS Result	MSD Result	Units	
Fluoride MS/MSD	1/30/2008	1,107.0	1,109.0	mg/L	
		% RPD= 0.2%			% Max RPD= 11.0%
Chloride MS/MSD	1/30/2008	1,034.0	1,031.0	mg/L	
		% RPD= 0.3%			% Max RPD= 5.3%
Nitrite MS/MSD	1/30/2008	1,021.0	1,024.0	mg/L	
		% RPD= 0.3%			% Max RPD= 3.9%
Sulfate MS/MSD	1/30/2008	10,314.0	10,353.0	mg/L	
		% RPD= 0.4%			% Max RPD= 10.1%
Bromide MS/MSD	1/30/2008	926.0	939.0	mg/L	
		% RPD= 1.4%			% Max RPD= 9.6%
Nitrate MS/MSD	1/30/2008	986.0	992.0	mg/L	
		% RPD= 0.6%			% Max RPD= 10.6%
Chlorate MS/MSD	1/30/2008	1,018.0	1,053.0	mg/L	
		% RPD= 3.4%			% Max RPD= 10.5%
Phosphate MS/MSD	1/30/2008	1,016.0	1,076.0	mg/L	
		% RPD= 5.7%			% Max RPD= 13.0%

Method Spike Summary: Anions

Sample:	Batch MS/MSD	7881-20		
	Date	MS Recovery	MSD Recovery	Control Limits
Fluoride MS/MSD	1/30/2008	109.8%	110.0%	78.3-142.6%
Chloride MS/MSD	1/30/2008	96.2%	95.9%	75.5-128.1%
Nitrite MS/MSD	1/30/2008	102.1%	102.4%	75.7-140.1
Sulfate MS/MSD	1/30/2008	128.0%	131.9%	76.7-134.4
Bromide MS/MSD	1/30/2008	92.6%	93.9%	68.3-129.6%
Nitrate MS/MSD	1/30/2008	97.0%	97.6%	73.7-131.7
Chlorate MS/MSD	1/30/2008	101.8%	105.3%	68.3-116.6
Phosphate MS/MSD	1/30/2008	101.6%	107.6%	64.9-142.9

*poor matrix recovery due to matrix interfernence - beyond linear range

Method Duplicates Summary: Anions

Sample:	Batch MS/MSD	7881-19			
	Date	MS Result	MSD Result	Units	
Fluoride MS/MSD	2/7/2008	1,099.0	1,177.0	mg/L	
		% RPD= 6.9%			% Max RPD= 11.0%
Chloride MS/MSD	2/7/2008	1,199.0	1,195.0	mg/L	
		% RPD= 0.3%			% Max RPD= 5.3%
Nitrite MS/MSD	2/7/2008	1,050.0	1,046.0	mg/L	
		% RPD= 0.4%			% Max RPD= 3.9%
Sulfate MS/MSD	2/7/2008	4,942.0	5,136.0	mg/L	
		% RPD= 3.8%			% Max RPD= 10.1%
Bromide MS/MSD	2/7/2008	1,140.0	1,117.0	mg/L	
		% RPD= 2.0%			% Max RPD= 9.6%
Nitrate MS/MSD	2/7/2008	1,127.0	1,128.0	mg/L	
		% RPD= 0.1%			% Max RPD= 10.6%
Chlorate MS/MSD	2/7/2008	1,177.0	1,187.0	mg/L	
		% RPD= 0.8%			% Max RPD= 10.5%
Phosphate MS/MSD	2/7/2008	1,101.0	1,115.0	mg/L	
		% RPD= 1.3%			% Max RPD= 13.0%

Method Spike Summary: Anions

Sample:	Batch MS/MSD	7881-19		
	Date	MS Recovery	MSD Recovery	Control Limits
Fluoride MS/MSD	2/7/2008	109.9%	117.7%	78.3-142.6%
Chloride MS/MSD	2/7/2008	119.9%	119.5%	75.5-128.1%
Nitrite MS/MSD	2/7/2008	105.0%	104.6%	75.7-140.1
Sulfate MS/MSD	2/7/2008	134.2%	153.6%	76.7-134.4
Bromide MS/MSD	2/7/2008	114.0%	111.7%	68.3-129.6%
Nitrate MS/MSD	2/7/2008	112.7%	112.8%	73.7-131.7
Chlorate MS/MSD	2/7/2008	117.7%	118.7%	68.3-116.6
Phosphate MS/MSD	2/7/2008	110.1%	111.5%	64.9-142.9

*poor matrix recovery due to matrix interfernence - beyond linear range

Shaw Environmental & Infrastructure, Inc.

17 Princess Road
Lawrenceville, NJ 08648
Tel: 609/895-5370
Fax: 609/895-1858

Reduced Deliverable Package

Prepared for
ER-0345

Lab ID
7886

Project Number: 117604 010000

Samples Received
29-Jan-08

Report
11-Feb-08

NJDEP Certified Lab 11001

Randi K Rothmel, PhD 2-11-08

Randi K Rothmel, PhD **Date**
Laboratory Director

Table of Contents

1.0 General Information
- Sample ID Table
- Chain of custody
- Internal chains of custody
- Methodology Review
- Data Reporting Qualifiers

2.0 Sample Summary Results

3.0 QA/QC Report

1.0 General Information

Chain of Custody (s)

Shaw
17 Princess Rd
Lawrenceville, NJ 08648
609-895-5370/ 609-895-1858
Shaw Environmental and Infrastructure Inc.

CHAIN OF CUSTODY

Ref. Document # _____

Page 1 of 2

7886

Project Contact: Jay Diebold (Name & phone #)

Send Report To: Jay
Phone/Fax Number: 414-291-2357
Address: 111 W. Pleasant St. #105
City/State: Milwaukee, WI

Project Number/Cost code: 117604 / 010000
Project Name / Location: ER-0345 / Henderson, NV
Purchase Order #:

Shipment Date: 1/28/08
Waybill/Airbill Number: A370 879 329 6
Lab Destination: Lawrenceville
Lab Contact Name / ph. #: Randy Rothmel

Sampler's Name(s):

Lab No.	Sample ID Number	Sample Description	Collection Information Date	Time	G/C	Matrix	# of containers	Container size	Preservative HCL	NaOH	HNO_3	H_2SO_4	Ice	Analyses Requested: Anions	pH	Metals	Perchlorate				Any Additional Information	Turn Around Time Requested
1	B5-25'	Soil	1/24/08	1135		Soil	1	1L poly					X	X	X	X	X					
2	B5-30'		1/24/08	1145																		
3	B5-35'		1/24/08	1155																		
4	B4-5'		1/24/08	1420																		
5	B4-10'			1435																		
6	B4-15'			1450																		
7	B4-20'			1505																		
8	B4-25'			1525																		
9	B4-30'			1540																		
10	SB-1-5'		1/25/08	0810																		

Special Instructions:

Known Waste Stream Circle:
RCRA PCB/dioxin PAH/oil RAD Corrosive Flammable Reactive

QC/Data Package Level Required:
I II III IV NJ EDD GIS EDD Preliminary data

Relinquished By:	Date:	Received By:	Date:
[signature] to U.P.S.	1/28/08 Time: 1500	[signature]	1/29/08 Time: 1130
Relinquished By:	Date: Time:	Received By:	Date: Time:
Relinquished By:	Date: Time:	Received By:	Date: Time:

G/C Codes
C = Composite G = Grab

QC Package Codes
Level I = data summary
Level II = data summary + basic QC
Level III = New Jersey QC reduced deliverable
Level IV = Full deliverable CLP package

Cooler temperature upon arrival at Lab:

000005

COC Continuation Page

Shaw
Shaw Environmental and Infrastructure Inc.

COC Ref. Document # _____

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7886

Project Number/ cost code: 117604 / 010000

Shipment Date: 1/28/08

Project Name / Location: ER-0345 / Henderson, NV

Lab No.	Sample ID Number	Sample Description	Collection Information Date	Time	G/C	Matrix	# of containers	Container size	Preservative HCL	NaOH	HNO_3	H_2SO_4	Ice		Analyses Requested: Anions	pH	Metals	Perchlorate					Any Additional information	Turn Around Time Requested
11	SB-1-10'	Soil	1/25/08	0825	G	S	1	1L plastic					X		X	X	X							
12	SB-1-15'			0840																				
13	SB-1-20'*			0850																			in temp. mate cooler	
14	SB-1-25'			0900																				
15	SB-1-30'			0910																				
16	SB-1-35'			0915																				
17	SB-2-5'			1020																				
18	SB-2-10'			1030																				
19	SB-2-15'			1045																				
20	SB-2-20'			1100																				
21	SB-2-25'			1105																				
22	SB-2-30'*			1115																			in separate cooler	
23	SB-2-35'*			1135																				
24	SB-1-water		1/25/08	0915			2	1L plastic 40ml vent. tube																
																								5000

Lab ID 78816
Client: ER-0345
Date Received: 1-29-08

Shaw E&I Analytical and Treatability Laboratories Internal Chain of Custody

Pg 1 of 3

Sample ID	Parameter	Bottle Type	Perservative	Date/Time Removed	Relinquishing Custodian Initials	Receiving Analyst Initials	Date/Time Returned	Receiving Custodian Initials	Relinquishing Analyst Initials
1	anions	IC	np	2/1/08 1200	A	M	2/1/08 1750	A	M
2									
10									
20									
21									
22									
23									
24									
1	pH	IC	np	1/31/08 8:00	A	M	1/31/08 1700	A	M
10									
20									
21									
22									
23									
24									

000007

Lab ID 7886
Client:
Date Received:

Shaw E&I Analytical and Treatability Laboratories Internal Chain of Custody

Pg 2 of 3

Sample ID	Parameter	Bottle Type	Perservative	Date/Time Removed	Relinquishing Custodian Initials	Receiving Analyst Initials	Date/Time Returned	Receiving Custodian Initials	Relinquishing Analyst Initials
1	metals	IL	NP						
10				Sub out					
20									
21									
22									
23									
24									
	Total Solids			1/30/08 10:30			1/30/08 10:30		
24									

000008

Lab ID 7876

Client:

Date Received:

Shaw E&I Analytical and Treatability Laboratories Internal Chain of Custody

Pg 3 of 3

Sample ID	Parameter	Bottle Type	Perservative	Date/Time Removed	Relinquishing Custodian Initials	Receiving Analyst Initials	Date/Time Returned	Receiving Custodian Initials	Relinquishing Analyst Initials
1	perchlorate	1L	NP	02-04-08-9:[illegible]	[illegible]	[illegible]	02-04-08 17[illegible]	[illegible]	[illegible]
2				02-04-08 9:[illegible]		[illegible]	02-04-08 17[illegible]		[illegible]

000009

Methodology Review

Volatile Organics

Unless otherwise specified, water samples are analyzed for volatile organics by purge and trap GC/MS as specified in EPA Method 8260b. Soil samples are prepared by 5035- methanol extraction prior to analysis by 5030. GC/MS nontargeted compounds are analyzed for only upon request using a library search of the EPA/NIST98 mass spectral library of compounds at the greatest apparent concentrations (>10%of the nearest internal standard) for a total of 15 hits.

Other Organics

Other Organics such as tertbutyl alcohol, and dissolved gases (methane,ethane, ethene, propane) are analyzed using modified EPA method RSK-175/8015 unless specified. Dissolved Hydrogen is analysed by RSK-175 using a GC equiped with a PDHID detector. Dissolved gases are prepared by a modification of Kampbell, and Vandegrift(Journal of Chromatographic Science, 1998, Vol 38, p253-256. Volatile fatty acids (acetate, formate, butyrate, proprionate) are analyzed by ion chromatography. Nitroaromatics are analyzed using Method 8330.

All Microbiogy and Inorganic analysis is done by standard methods as specified in Test Method for Evaluating Solid Wastes, SW846, on line methods; EPA methods and Guidance of Analysis of Water, 1999; or Standard Methods for the examination of Water and Wastewater, 18/19th ed.

Microbiology

Parameter	Method Code (s)	
Total Heterotrophs	SM9215C	
Specific Heterotrophs	SM9215C-BSM	
Biological Oxygen Demand	EPA405.1	
Biological Oxygen Demand, Carbon	SM5210B	

Wet Chemistry -Inorganics

Anions (chloride, nitrite,bromide, nitrate as N, nitrate as N phosphate as P,ortho, sulfate as SO4	EPA300.0	
Perchlorate,sol	EPA314.0	
Chlorate,sol	EPA300.0m	
Ammonia as NH3-N	EPA350.2	
TKN	EPA351.3	
Alkalinity as CaCO3	EPA310.1	
Hardness as CaCO3	EPA130.2	
Carbon Dioxide	SM4500-CO2	
Total Organic Carbon	EPA415.1	SW-846 9060
Chemical Oxygen Demand	EPA410.4	SM5220D
pH	EPA150.1	SW-846 9045C
Total Dissolved Solids (TDS)	EPA160.1	
Total Solids	EPA160.3	SM2540G
Total Suspended Solids (TSS)	EPA160.2	
Volatile Suspended Solids (VSS)	EPA160.4	SM2540G
Conductivity	EPA120.1	SW-846 9050A
Phosphorus (all forms)	EPA365.2	
Sulfide	EPA376.2	SM4500-S D
Total Resdual Chlorine	EPA330.5	SM4500-Cl G

Reporting Qualifiers

U- The compound was not detected at the indicated PQL concentration.

J- Approximate concentration of the compound. Detection of compound above calculated MDL but below the PQL of the analytical method. 99% confidence that the compound is present.

D- Diluted sample

B- The analyte was observed in laboratory blank as well as the sample - for EPA SW856 8260b and EPA 624 analysis

E- Compound detected above the linear range of the curve. Value given is an estimated value.

2.0 Sample Results

Shaw Environmental
Analytical and Treatability Laboratories

17 Princess Road
Lawrenceville, New Jersey 08648
Tel; 609/895-5370
Fax: 609/895-1858

Sample Information			
Lab ID	7886-1	Date Sampled	01/24/2008
Sample ID	B5-25'	Date Received	01/29/2008
Matrix	*Soil*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	9.28	D	mg/Kg	1.14	0.244	10	EPA 300.0
Chloride	01/31/2008	102	D	mg/Kg	1.14	0.233	10	EPA 300.0
Nitrite as N	01/31/2008	1.1	U	mg/Kg	1.14	1.865	10	EPA 300.0
Sulfate as SO4	02/07/2008	3,650	D	mg/Kg	57.21	8.924	500	EPA 300.0
Bromide	01/31/2008	1.1	U	mg/Kg	1.14	0.327	10	EPA 300.0
Nitrate as N	01/31/2008	35.8	D	mg/Kg	1.14	0.111	10	EPA 300.0
Chlorate	01/31/2008	1.1	U	mg/Kg	1.14	0.196	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.1	U	mg/Kg	1.14	0.265	10	EPA 300.0
pH	01/31/2008	8.66		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	270,000	D	ug/Kg	2,860	438.8	5,000	EPA 314.0
Total Solids	01/30/2008	87.4		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
(1) Not listed as a Shaw Certified paramaters under the NJDEP lab certification program.
(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-2**	**Date Sampled**	01/24/2008
Sample ID	**B5-30'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	9.89	D	mg/Kg	1.34	0.286	10	EPA 300.0
Chloride	01/31/2008	256	D	mg/Kg	1.34	0.274	10	EPA 300.0
Nitrite as N	01/31/2008	1.3	U	mg/Kg	1.34	2.191	10	EPA 300.0
Sulfate as SO4	02/07/2008	729	D	mg/Kg	13.44	2.097	100	EPA 300.0
Bromide	01/31/2008	1.3	U	mg/Kg	1.34	0.384	10	EPA 300.0
Nitrate as N	01/31/2008	19.1	D	mg/Kg	1.34	0.130	10	EPA 300.0
Chlorate	01/31/2008	5.86	D	mg/Kg	1.34	0.230	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.3	U	mg/Kg	1.34	0.312	10	EPA 300.0
pH	01/31/2008	8.92		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	123,000	D	ug/Kg	3,360	515.5	5,000	EPA 314.0
Total Solids	01/30/2008	74.4		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
(1) Not listed as a Shaw Certified paramaters under the NJDEP lab certification program.
(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	7886-3	Date Sampled	01/24/2008
Sample ID	B5-35'	Date Received	01/29/2008
Matrix	*Soil*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	13.1	D	mg/Kg	1.88	0.400	10	EPA 300.0
Chloride	02/07/2008	576	D	mg/Kg	18.76	3.827	100	EPA 300.0
Nitrite as N	01/31/2008	1.9	U	mg/Kg	1.88	3.058	10	EPA 300.0
Sulfate as SO4	02/07/2008	1,120	D	mg/Kg	18.76	2.927	100	EPA 300.0
Bromide	01/31/2008	1.9	U	mg/Kg	1.88	0.537	10	EPA 300.0
Nitrate as N	01/31/2008	8.09	D	mg/Kg	1.88	0.182	10	EPA 300.0
Chlorate	01/31/2008	8.74	D	mg/Kg	1.88	0.321	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.9	U	mg/Kg	1.88	0.435	10	EPA 300.0
pH	01/31/2008	8.44		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	69,700	D	ug/Kg	4,690	719.5	5,000	EPA 314.0
Total Solids	01/30/2008	53.3		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-4**	**Date Sampled**	01/24/2008
Sample ID	**B4-5'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	2.60	D	mg/Kg	1.12	0.239	10	EPA 300.0
Chloride	02/07/2008	2,400	D	mg/Kg	22.42	4.574	200	EPA 300.0
Nitrite as N	01/31/2008	7.33	D	mg/Kg	1.12	1.827	10	EPA 300.0
Sulfate as SO4	01/31/2008	355	ED	mg/Kg	1.12	0.175	10	EPA 300.0
Bromide	01/31/2008	1.1	U	mg/Kg	1.12	0.321	10	EPA 300.0
Nitrate as N	01/31/2008	58.7	D	mg/Kg	1.12	0.109	10	EPA 300.0
Chlorate	01/31/2008	18.0	D	mg/Kg	1.12	0.192	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.1	U	mg/Kg	1.12	0.260	10	EPA 300.0
pH	01/31/2008	8.31		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/06/2008	6,900,000	D	ug/Kg	5,605	859.9	10,000	EPA 314.0
Total Solids	01/30/2008	89.2		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
(1) Not listed as a Shaw Certified paramaters under the NJDEP lab certification program.
(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-5**	**Date Sampled**	01/24/2008
Sample ID	**B4-10'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	4.55	D	mg/Kg	1.08	0.230	10	EPA 300.0
Chloride	02/07/2008	378	D	mg/Kg	5.41	1.103	50	EPA 300.0
Nitrite as N	01/31/2008	9.37	D	mg/Kg	1.08	1.762	10	EPA 300.0
Sulfate as SO4	02/07/2008	373	D	mg/Kg	5.41	0.843	50	EPA 300.0
Bromide	01/31/2008	1.1	U	mg/Kg	1.08	0.309	10	EPA 300.0
Nitrate as N	01/31/2008	50.9	D	mg/Kg	1.08	0.105	10	EPA 300.0
Chlorate	01/31/2008	16.6	D	mg/Kg	1.08	0.185	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.1	U	mg/Kg	1.08	0.251	10	EPA 300.0
pH	01/31/2008	8.79		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/06/2008	1,620,000	D	ug/Kg	5,405	829.2	10,000	EPA 314.0
Total Solids	01/30/2008	92.5		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-6**	**Date Sampled**	01/24/2008
Sample ID	**B4-15'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	8.78	D	mg/Kg	1.09	0.232	10	EPA 300.0
Chloride	01/31/2008	163	D	mg/Kg	1.09	0.222	10	EPA 300.0
Nitrite as N	01/31/2008	2.06	D	mg/Kg	1.09	1.774	10	EPA 300.0
Sulfate as SO4	01/31/2008	158	D	mg/Kg	1.09	0.170	10	EPA 300.0
Bromide	01/31/2008	1.1	U	mg/Kg	1.09	0.311	10	EPA 300.0
Nitrate as N	02/07/2008	449	D	mg/Kg	5.44	0.528	50	EPA 300.0
Chlorate	01/31/2008	1.1	U	mg/Kg	1.09	0.186	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.1	U	mg/Kg	1.09	0.252	10	EPA 300.0
pH	01/31/2008	8.42		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	615,000	D	ug/Kg	2,720	417.3	5,000	EPA 314.0
Total Solids	01/30/2008	91.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
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Sample Information			
Lab ID	**7886-7**	**Date Sampled**	01/24/2008
Sample ID	**B4-20'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	8.13	D	mg/Kg	1.09	0.232	10	EPA 300.0
Chloride	01/31/2008	92.3	D	mg/Kg	1.09	0.222	10	EPA 300.0
Nitrite as N	01/31/2008	4.91	D	mg/Kg	1.09	1.774	10	EPA 300.0
Sulfate as SO4	02/07/2008	6,700	D	mg/Kg	54.41	8.487	500	EPA 300.0
Bromide	01/31/2008	1.1	U	mg/Kg	1.09	0.311	10	EPA 300.0
Nitrate as N	02/07/2008	434	D	mg/Kg	5.44	0.528	50	EPA 300.0
Chlorate	01/31/2008	1.1	U	mg/Kg	1.09	0.186	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.1	U	mg/Kg	1.09	0.252	10	EPA 300.0
pH	01/31/2008	8.30		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	364,000	D	ug/Kg	2,720	417.3	5,000	EPA 314.0
Total Solids	01/30/2008	91.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-8**	**Date Sampled**	01/24/2008
Sample ID	**B4-25'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	14.7	D	mg/Kg	1.22	0.260	10	EPA 300.0
Chloride	01/31/2008	222	D	mg/Kg	1.22	0.249	10	EPA 300.0
Nitrite as N	01/31/2008	1.2	U	mg/Kg	1.22	1.990	10	EPA 300.0
Sulfate as SO4	02/07/2008	819	D	mg/Kg	6.11	0.952	50	EPA 300.0
Bromide	01/31/2008	1.2	U	mg/Kg	1.22	0.349	10	EPA 300.0
Nitrate as N	01/31/2008	40.7	D	mg/Kg	1.22	0.118	10	EPA 300.0
Chlorate	01/31/2008	12.5	D	mg/Kg	1.22	0.209	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.2	U	mg/Kg	1.22	0.283	10	EPA 300.0
pH	01/31/2008	8.86		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	282,000	D	ug/Kg	3,053	468.3	5,000	EPA 314.0
Total Solids	01/30/2008	81.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-9**	**Date Sampled**	01/24/2008
Sample ID	**B4-30'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	10.6	D	mg/Kg	1.49	0.316	10	EPA 300.0
Chloride	02/07/2008	421	D	mg/Kg	7.43	1.516	50	EPA 300.0
Nitrite as N	01/31/2008	3.37	D	mg/Kg	1.49	2.422	10	EPA 300.0
Sulfate as SO4	02/07/2008	715	D	mg/Kg	7.43	1.159	50	EPA 300.0
Bromide	01/31/2008	1.5	U	mg/Kg	1.49	0.425	10	EPA 300.0
Nitrate as N	01/31/2008	15.3	D	mg/Kg	1.49	0.144	10	EPA 300.0
Chlorate	01/31/2008	7.65	D	mg/Kg	1.49	0.254	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.5	U	mg/Kg	1.49	0.345	10	EPA 300.0
pH	01/31/2008	8.32		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	308,000	D	ug/Kg	3,715	569.8	5,000	EPA 314.0
Total Solids	01/30/2008	67.3		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-10**	**Date Sampled**	01/25/2008
Sample ID	**SB-1-5'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	6.22	D	mg/Kg	1.12	0.239	10	EPA 300.0
Chloride	01/31/2008	9.22	D	mg/Kg	1.12	0.229	10	EPA 300.0
Nitrite as N	01/31/2008	1.1	U	mg/Kg	1.12	1.831	10	EPA 300.0
Sulfate as SO4	01/31/2008	161	D	mg/Kg	1.12	0.175	10	EPA 300.0
Bromide	01/31/2008	1.1	U	mg/Kg	1.12	0.321	10	EPA 300.0
Nitrate as N	01/31/2008	2.02	D	mg/Kg	1.12	0.109	10	EPA 300.0
Chlorate	01/31/2008	1.1	U	mg/Kg	1.12	0.192	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.1	U	mg/Kg	1.12	0.261	10	EPA 300.0
pH	01/31/2008	9.62		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/06/2008	9,010	D	ug/Kg	56	8.6	100	EPA 314.0
Total Solids	01/30/2008	89.0		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	7886-11	Date Sampled	01/25/2008
Sample ID	SB-1-10'	Date Received	01/29/2008
Matrix	*Soil*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	01/31/2008	4.29	D	mg/Kg	1.13	0.240	10	EPA 300.0
Chloride	01/31/2008	29.0	D	mg/Kg	1.13	0.230	10	EPA 300.0
Nitrite as N	01/31/2008	1.1	U	mg/Kg	1.13	1.840	10	EPA 300.0
Sulfate as SO4	02/07/2008	541	D	mg/Kg	5.64	0.880	50	EPA 300.0
Bromide	01/31/2008	1.1	U	mg/Kg	1.13	0.323	10	EPA 300.0
Nitrate as N	01/31/2008	10.5	D	mg/Kg	1.13	0.109	10	EPA 300.0
Chlorate	01/31/2008	1.1	U	mg/Kg	1.13	0.193	10	EPA 300.0
Phosphate as P, ortho	01/31/2008	1.1	U	mg/Kg	1.13	0.262	10	EPA 300.0
pH	01/31/2008	9.35		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	49,900	D	ug/Kg	2,822	432.8	5,000	EPA 314.0
Total Solids	01/30/2008	88.6		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-12**	**Date Sampled**	01/25/2008
Sample ID	**SB-1-15'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	8.42	D	mg/Kg	1.08	0.230	10	EPA 300.0
Chloride	02/01/2008	67.3	D	mg/Kg	1.08	0.220	10	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.08	1.756	10	EPA 300.0
Sulfate as SO4	02/01/2008	249	D	mg/Kg	1.08	0.168	10	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.08	0.308	10	EPA 300.0
Nitrate as N	02/01/2008	15.1	D	mg/Kg	1.08	0.105	10	EPA 300.0
Chlorate	02/01/2008	4.64	D	mg/Kg	1.08	0.184	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.08	0.250	10	EPA 300.0
pH	01/31/2008	9.31		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	222,000	D	ug/Kg	2,694	413.3	5,000	EPA 314.0
Total Solids	01/30/2008	92.8		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Analytical and Treatability Laboratories

17 Princess Road
Lawrenceville, New Jersey 08648
Tel; 609/895-5370
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Sample Information			
Lab ID	**7886-13**	**Date Sampled**	01/25/2008
Sample ID	**SB-1-20'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	2.59	D	mg/Kg	1.09	0.233	10	EPA 300.0
Chloride	02/01/2008	84.0	D	mg/Kg	1.09	0.223	10	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.09	1.783	10	EPA 300.0
Sulfate as SO4	02/07/2008	16,200	D	mg/Kg	109.41	17.068	1,000	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.09	0.313	10	EPA 300.0
Nitrate as N	02/01/2008	18.8	D	mg/Kg	1.09	0.106	10	EPA 300.0
Chlorate	02/01/2008	8.35	D	mg/Kg	1.09	0.187	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.09	0.254	10	EPA 300.0
pH	01/31/2008	8.61		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	329,000	D	ug/Kg	2,735	419.6	5,000	EPA 314.0
Total Solids	01/30/2008	91.4		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-14**	**Date Sampled**	01/25/2008
Sample ID	**SB-1-25'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	2.62	D	mg/Kg	1.16	0.247	10	EPA 300.0
Chloride	02/01/2008	258	D	mg/Kg	1.16	0.236	10	EPA 300.0
Nitrite as N	02/01/2008	1.2	U	mg/Kg	1.16	1.887	10	EPA 300.0
Sulfate as SO4	02/07/2008	10,270	D	mg/Kg	57.87	9.028	500	EPA 300.0
Bromide	02/01/2008	1.2	U	mg/Kg	1.16	0.331	10	EPA 300.0
Nitrate as N	02/01/2008	85.0	D	mg/Kg	1.16	0.112	10	EPA 300.0
Chlorate	02/01/2008	40.7	D	mg/Kg	1.16	0.198	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.2	U	mg/Kg	1.16	0.269	10	EPA 300.0
pH	01/31/2008	8.70		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	759,000	D	ug/Kg	2,894	443.9	5,000	EPA 314.0
Total Solids	01/30/2008	86.4		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-15**	**Date Sampled**	01/25/2008
Sample ID	**SB-1-30'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	13.2	D	mg/Kg	1.62	0.344	10	EPA 300.0
Chloride	02/07/2008	946	D	mg/Kg	16.16	3.296	100	EPA 300.0
Nitrite as N	02/01/2008	1.6	U	mg/Kg	1.62	2.633	10	EPA 300.0
Sulfate as SO4	02/07/2008	882	D	mg/Kg	16.16	2.520	100	EPA 300.0
Bromide	02/01/2008	1.6	U	mg/Kg	1.62	0.462	10	EPA 300.0
Nitrate as N	02/01/2008	14.8	D	mg/Kg	1.62	0.157	10	EPA 300.0
Chlorate	02/07/2008	1,340	D	mg/Kg	16.16	2.763	100	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.6	U	mg/Kg	1.62	0.375	10	EPA 300.0
pH	01/31/2008	8.85		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	380,000	D	ug/Kg	4,039	619.5	5,000	EPA 314.0
Total Solids	01/30/2008	61.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-16**	**Date Sampled**	01/25/2008
Sample ID	**SB-1-35'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	9.37	D	mg/Kg	1.56	0.333	10	EPA 300.0
Chloride	02/07/2008	1,040	D	mg/Kg	15.65	3.192	100	EPA 300.0
Nitrite as N	02/01/2008	1.6	U	mg/Kg	1.56	2.551	10	EPA 300.0
Sulfate as SO4	02/07/2008	908	D	mg/Kg	15.65	2.441	100	EPA 300.0
Bromide	02/01/2008	1.6	U	mg/Kg	1.56	0.448	10	EPA 300.0
Nitrate as N	02/01/2008	19.6	D	mg/Kg	1.56	0.152	10	EPA 300.0
Chlorate	02/07/2008	1,410	D	mg/Kg	15.65	2.676	100	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.6	U	mg/Kg	1.56	0.363	10	EPA 300.0
pH	01/31/2008	9.03		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	432,000	D	ug/Kg	3,912	600.2	5,000	EPA 314.0
Total Solids	01/30/2008	63.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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( ) no qualification - sample run undiluted
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(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	7886-17	Date Sampled	01/25/2008
Sample ID	SB-2-5'	Date Received	01/29/2008
Matrix	*Soil*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	4.50	D	mg/Kg	1.10	0.234	10	EPA 300.0
Chloride	02/01/2008	52.4	D	mg/Kg	1.10	0.224	10	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.10	1.793	10	EPA 300.0
Sulfate as SO4	02/01/2008	180	D	mg/Kg	1.10	0.172	10	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.10	0.315	10	EPA 300.0
Nitrate as N	02/01/2008	6.56	D	mg/Kg	1.10	0.107	10	EPA 300.0
Chlorate	02/01/2008	1.1	D	mg/Kg	1.10	0.188	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.10	0.255	10	EPA 300.0
pH	01/31/2008	9.46		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	83,600	D	ug/Kg	2,750	421.9	5,000	EPA 314.0
Total Solids	01/30/2008	90.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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( ) no qualification - sample run undiluted
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(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-18**	**Date Sampled**	01/25/2008
Sample ID	**SB-2-10'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	3.85	D	mg/Kg	1.11	0.237	10	EPA 300.0
Chloride	02/01/2008	160	D	mg/Kg	1.11	0.227	10	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.11	1.813	10	EPA 300.0
Sulfate as SO4	02/07/2008	721	D	mg/Kg	11.12	1.735	100	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.11	0.318	10	EPA 300.0
Nitrate as N	02/01/2008	15.9	D	mg/Kg	1.11	0.108	10	EPA 300.0
Chlorate	02/01/2008	5.81	D	mg/Kg	1.11	0.190	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.11	0.258	10	EPA 300.0
pH	01/31/2008	9.27		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	261,000	D	ug/Kg	2,781	426.6	5,000	EPA 314.0
Total Solids	01/30/2008	89.9		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-19**	**Date Sampled**	01/25/2008
Sample ID	**SB-2-15'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concent ration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	7.86	D	mg/Kg	1.10	0.235	10	EPA 300.0
Chloride	02/07/2008	333	D	mg/Kg	5.51	1.123	50	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.10	1.795	10	EPA 300.0
Sulfate as SO4	02/07/2008	377	D	mg/Kg	5.51	0.859	50	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.10	0.315	10	EPA 300.0
Nitrate as N	02/01/2008	18.6	D	mg/Kg	1.10	0.107	10	EPA 300.0
Chlorate	02/01/2008	8.54	D	mg/Kg	1.10	0.188	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.10	0.256	10	EPA 300.0
pH	01/31/2008	9.07		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	391,000	D	ug/Kg	2,753	422.4	5,000	EPA 314.0
Total Solids	01/30/2008	90.8		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-20**	**Date Sampled**	01/25/2008
Sample ID	**SB-2-20'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	4.51	D	mg/Kg	1.06	0.226	10	EPA 300.0
Chloride	02/01/2008	232	D	mg/Kg	21.21	4.327	200	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.06	1.729	10	EPA 300.0
Sulfate as SO4	02/01/2008	234	D	mg/Kg	21.21	3.309	200	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.06	0.303	10	EPA 300.0
Nitrate as N	02/01/2008	12.0	D	mg/Kg	1.06	0.103	10	EPA 300.0
Chlorate	02/01/2008	6.14	D	mg/Kg	1.06	0.181	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.06	0.246	10	EPA 300.0
pH	01/31/2008	9.19		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	165,000	D	ug/Kg	2,651	406.7	5,000	EPA 314.0
Total Solids	01/30/2008	94.3		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(U) Compound not detected above method practical quantitation limit.
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(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-21**	**Date Sampled**	01/25/2008
Sample ID	**SB-2-25'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	9.46	D	mg/Kg	1.15	0.244	10	EPA 300.0
Chloride	02/07/2008	526	D	mg/Kg	11.45	2.337	100	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.15	1.867	10	EPA 300.0
Sulfate as SO4	02/07/2008	483	D	mg/Kg	11.45	1.787	100	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.15	0.328	10	EPA 300.0
Nitrate as N	02/01/2008	57.0	D	mg/Kg	1.15	0.111	10	EPA 300.0
Chlorate	02/01/2008	1.1	U	mg/Kg	1.15	0.196	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.15	0.266	10	EPA 300.0
pH	01/31/2008	8.86		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	245,000	D	ug/Kg	2,864	439.3	5,000	EPA 314.0
Total Solids	01/30/2008	87.3		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-22**	**Date Sampled**	01/25/2008
Sample ID	**SB2-30'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	5.99	D	mg/Kg	1.08	0.230	10	EPA 300.0
Chloride	02/01/2008	84.6	D	mg/Kg	1.08	0.220	10	EPA 300.0
Nitrite as N	02/01/2008	1.1	U	mg/Kg	1.08	1.758	10	EPA 300.0
Sulfate as SO4	02/01/2008	173	D	mg/Kg	1.08	0.168	10	EPA 300.0
Bromide	02/01/2008	1.1	U	mg/Kg	1.08	0.309	10	EPA 300.0
Nitrate as N	02/01/2008	7.98	D	mg/Kg	1.08	0.105	10	EPA 300.0
Chlorate	02/01/2008	62.1	D	mg/Kg	1.08	0.184	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.1	U	mg/Kg	1.08	0.250	10	EPA 300.0
pH	01/31/2008	9.44		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	58,500	D	ug/Kg	2,697	413.7	5,000	EPA 314.0
Total Solids	01/30/2008	92.7		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	**7886-23**	**Date Sampled**	01/25/2008
Sample ID	**SB2-35'**	**Date Received**	01/29/2008
Matrix	***Soil***		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	10.1	D	mg/Kg	1.56	0.331	10	EPA 300.0
Chloride	02/07/2008	969	D	mg/Kg	7.78	1.586	50	EPA 300.0
Nitrite as N	02/01/2008	1.6	U	mg/Kg	1.56	2.535	10	EPA 300.0
Sulfate as SO4	02/07/2008	858	D	mg/Kg	7.78	1.213	50	EPA 300.0
Bromide	02/01/2008	1.6	U	mg/Kg	1.56	0.445	10	EPA 300.0
Nitrate as N	02/01/2008	8.91	D	mg/Kg	1.56	0.151	10	EPA 300.0
Chlorate	02/01/2008	1,490	ED	mg/Kg	1.56	0.266	10	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.6	U	mg/Kg	1.56	0.361	10	EPA 300.0
pH	01/31/2008	8.95		SU	NA	NA	**	EPA 150.1
Perchlorate,sol	02/04/2008	301,000	D	ug/Kg	3,888	596.4	5,000	EPA 314.0
Total Solids	01/30/2008	64.3		%	10.0	1.970	1	EPA 160.3

** 5 grams soil added to 50 ml dH2O, sample shaken overnight and pH read on water.

Shaw Environmental NJDEP certified Lab ID 11001.
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(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

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Sample Information			
Lab ID	7886-24	Date Sampled	01/25/2008
Sample ID	SB-1-water	Date Received	01/29/2008
Matrix	*Aqueous*		

Limited Chemistry

Parameter	*Date Analyzed*	*Concentration*	*Qual (see below)*	*Units*	*PQL*	*MDL*	*Dilution Factor*	*Method Code*
Fluoride	02/01/2008	0.62	JD	mg/L	1.00	0.213	10	EPA 300.0
Chloride	02/01/2008	1,720	D	mg/L	20.00	4.080	200	EPA 300.0
Nitrite as N	02/01/2008	1.0	U	mg/L	1.00	1.630	10	EPA 300.0
Sulfate as SO4	02/01/2008	1,100	D	mg/L	20.00	3.120	200	EPA 300.0
Bromide	02/01/2008	1.0	U	mg/L	1.00	0.286	10	EPA 300.0
Nitrate as N	02/01/2008	27.3	D	mg/L	1.00	0.097	10	EPA 300.0
Chlorate	02/01/2008	2,220	D	mg/L	20.00	3.420	200	EPA 300.0
Phosphate as P, ortho	02/01/2008	1.0	U	mg/L	1.00	0.232	10	EPA 300.0
pH	01/31/2008	7.37		SU	NA	NA	1	EPA 150.1
Perchlorate,sol	02/06/2008	826,000	D	ug/L	5,000	767.0	10,000	EPA 314.0

Shaw Environmental NJDEP certified Lab ID 11001.
(1) Not listed as a Shaw Certified paramaters under the NJDEP lab certification program.
(2) Not available as a certified parameter under the NJDEP lab certification program.
( ) no qualification - sample run undiluted
(U) Compound not detected above method practical quantitation limit.
(D) Sample analyzed at indicated dilution
(J) Estimated value above MDL and less than PQL
(E) Estimated value beyond linear range

3.0 QC Summary

Sample Batch:Perchlorate

Lab ID	Analysis dates	
7886- 1	2/4/2008	
7886- 2	2/4/2008	
7886- 3	2/4/2008	
7886- 4	2/4/2008	2/6/2008
7886- 5	2/4/2008	2/6/2008
7886- 6	2/4/2008	
7886- 7	2/4/2008	
7886- 8	2/4/2008	
7886- 9	2/4/2008	
7886- 10	2/4/2008	2/6/2008
7886- 11	2/4/2008	
7886- 12	2/4/2008	
7886- 13	2/4/2008	
7886- 14	2/4/2008	
7886- 15	2/4/2008	
7886- 16	2/4/2008	
7886- 17	2/4/2008	
7886- 18	2/4/2008	
7886- 19	2/4/2008	
7886- 20	2/4/2008	
7886- 21	2/4/2008	
7886- 22	2/4/2008	
7886- 23	2/4/2008	
7886- 24	2/4/2008	2/6/2008

Initial Calibration Summary:ClO4

Calibration Standard recoveries:

Initial Calibration Date: 10/31/2007

Sample:	Std ppb	observed ppb	% recovery
cal standard	0.5	0.635	127.0
cal standard	1	1.08	108.0
cal standard	5	4.72	94.4
cal standard	20	20.7	103.5
cal standard	50	48.9	97.8
cal standard	100	100.5	100.5
cal standard	200	199.9	100.0

r2= 0.99990

QCCheck Date: 10/31/2007

Sample:	Std ppB	observed ppb	% recovery	Control Limits
QC Check	10.0	9.5	95.0	80.0-120.0%

Method Blank Summary:ClO4

Sample	Date	Concentration	Units	PQL
Blank	10/31/2007	u	ppb	1.0

u: Compound not detected above Practical Quantitation Limit (PQL).

Calibration Verification Summary:Perchlorate

Check Standard recoveries:

Sample:	Date	Std ppb	observed ppb	% recovery
check standard	2/4/2008	20	17.9	89.5
	2/4/2008	50	45.5	91.0
	2/6/2008	20	18.2	91.0
	2/6/2008	50	50.5	101.0
			Control Limits:	73.9-119.7

QC Check:

Sample:	Date	Std ppb	observed ppb	% recovery
QC Check	2/4/2008	10.5	10.93	104.1
	2/6/2008	10.5	11.49	109.4
			Control Limits:	73.9-119.7

Method Blank Summary:Perchlorate

Sample	Date	Concentration	Units	PQL
Blank	2/4/2008	u	ug/L	1.0
Blank	2/6/2008	u	ug/L	1.0

u: Compound not detected above Practical Quantitation Limit (PQL).

Instrument Preformance Summary:Perchlorate

Sample	Date	Std ppb	observed ppb	% recovery
IPC	2/4/2008	20	19.4	97.0
IPC	2/6/2008	20	20.87	104.4
			Control Limits:	66.3-111.7

Method Duplicates Summary:Perchlorate

Sample:

	Date	MS Result	MSD Result	Units
Batch MS/MSD 7886-9	2/4/2008	303,253.00	301,178.00	mg/L
		RPD=	0.7%	
		% Max RPD=	6.4%	
Batch MS/MSD 7886-24	2/6/2008	1,007,012.00	1,003,792.00	mg/L
		RPD=	0.3%	
		% Max RPD=	6.4%	

Method Spike Summary:Perchlorate

Sample:

	Date	MS Recovery	MSD Recovery	Control Limits
Batch MS/MSD	2/4/2008	96.0%	93.9%	93.9-113.9%
Batch MS/MSD	2/6/2008	90.3%	88.7%	93.9-113.9%

Sample Batch: Anions

Lab ID	Analysis date	
7886- 1	1/31/2008	2/7/2008
7886- 2	1/31/2008	2/7/2008
7886- 3	1/31/2008	2/7/2008
7886- 4	1/31/2008	2/7/2008
7886- 5	1/31/2008	2/7/2008
7886- 6	1/31/2008	2/7/2008
7886- 7	1/31/2008	2/7/2008
7886- 8	1/31/2008	2/7/2008
7886- 9	1/31/2008	2/7/2008
7886- 10	1/31/2008	
7886- 11	1/31/2008	2/7/2008
7886- 12	2/1/2008	
7886- 13	2/1/2008	2/7/2008
7886- 14	2/1/2008	2/7/2008
7886- 15	2/1/2008	2/7/2008
7886- 16	2/1/2008	2/7/2008
7886- 17	2/1/2008	2/7/2008
7886- 18	2/1/2008	2/7/2008
7886- 19	2/1/2008	2/7/2008
7886- 20	2/1/2008	
7886- 21	2/1/2008	
7886- 22	2/1/2008	
7886- 23	2/1/2008	2/7/2008
7886- 24	2/1/2008	

Initial Calibration Summary: Anions

Calibration Standard recoveries:

Initial Calibration Date: 12/27/2007

Sample:							
Std ppm		0.1	0.5	2.0	5.0	20.0	R^2=
Fluoride		0.091	0.508	2.086	5.210	19.700	
	%rec	91	101.54	104.3	104.2	20.345	0.99580
Chloride		0.0698	0.438	1.720	4.520	20.3	
	%rec	69.8	87.6	86	90.4	101.5	0.99960
Nitrite		0.082	0.472	1.990	5.060	19.860	
	%rec	81.5	94.38	99.5	101.2	99.3	0.99990
Sulfate		0.0539	0.353	1.640	4.398	20.400	
	%rec	53.9	70.66	82	87.96	102	0.99930
Bromide		0.056	0.414	1.715	4.418	20.390	
	%rec	56	82.8	85.75	88.36	101.95	0.99930
Nitrate		0.074	0.413	1.749	4.613	20.230	
	%rec	74	82.54	87.5	92.26	101.15	0.99970
Chlorate		0.059	0.368	1.629	4.326	20.450	
	%rec	59	73.56	81.45	86.52	102.25	0.99910
Phosphate		0.141	0.809	2.170	5.055	19.900	
	%rec	141	161.8	108.5	101.1	99.5	0.99990

QC Check Date: 12/27/2007

Sample:	Std ppm	Obs ppm	% recovery	Control Limits
QC Check-Fluoride	10.0	10.7	1044.0	80.0-120.0%
QC Check-Chloride	10.0	9.98	9.7	80.0-120.0%
QC Check-Nitrite	10.0	10.49	10.2	80.0-120.0%
QC Check-Sulfate	10.0	9.916	9.6	80.0-120.0%
QC Check-Bromide	10.0	9.902	9.8	80.0-120.0%
QC Check-Nitrate	10.0	9.933	9.5	80.0-120.0%
QC Check-Chlorate	10.0	9.862	10.3	80.0-120.0%
QC Check-Phosphate	10.0	10.05	100.5	80.0-120.0%

Method Blank Summary: Anions

Sample	Date	Concentration	Units	PQL
Blank-Fluoride	12/27/2007	u	ppm	0.2
Blank-Chloride	12/27/2007	u	ppm	0.2
Blank-Nitrite	12/27/2007	u	ppm	0.2
Blank-Sulfate	12/27/2007	u	ppm	0.2
Blank-Bromide	12/27/2007	u	ppm	0.2
Blank-Nitrate	12/27/2007	u	ppm	0.2
Blank-Chlroate	12/27/2007	u	ppm	0.2
Blank-Phosphate	12/27/2007	u	ppm	0.2

Calibration Verification Summary: Anions

Check Standard recoveries:

Sample:	Date	Std ppm	Obs ppm	% recovery
Fluoride check	1/31/2008	5.00	5.4	107.3
			Control Limits: 98.6-121.8	
Chloride check	1/31/2008	5.00	4.7	93.4
			Control Limits: 81.8-110.9	
Nitrite check	1/31/2008	5.00	5.194	103.9
			Control Limits: 80.8-128.5	
Sulfate check	1/31/2008	5.00	4.769	95.4
			Control Limits: 80.5-122.3	
Bromide check	1/31/2008	5.00	4.6	91.3
			Control Limits: 75.6-109.2	
Nitrate check	1/31/2008	5.00	4.8	95.3
			Control Limits: 82.2-117.5	
Chlorate check	1/31/2008	5.00	5.262	105.2
			Control Limits: 73.0-108.3	
Phosphate check	1/31/2008	5.00	5.198	104.0
			Control Limits: 80.2-120.9	

QC Check:

Sample:	Date	Std ppm	Obs ppm	% recovery
QC Check-Fluoride	1/31/2008	25.0	26.6	106.4
QC Check-Chloride	1/31/2008	50.0	49.5	99.0
QC Check-Nitrite	1/31/2008	15.0	15.8	105.3
QC Check-Sulfate	1/31/2008	50.0	49.0	98.0
QC Check-Bromide	1/31/2008	50.0	47.8	95.6
QC Check-Nitrate	1/31/2008	11.0	10.3	93.2
QC Check-Phosphate	1/31/2008	16.0	16.86	105.4

Control Limits: 80.0-120.0%

Method Blank Summary: Anions

Sample	Date	Concentration	Units	PQL
Blank-Fluoride	1/31/2008	u	ppm	0.2
Blank-Chloride	1/31/2008	u	ppm	0.2
Blank-Nitrite	1/31/2008	u	ppm	0.2
Blank-Sulfate	1/31/2008	u	ppm	0.2
Blank-Bromide	1/31/2008	u	ppm	0.2
Blank-Nitrate	1/31/2008	u	ppm	0.2
Blank-Chlroate	1/31/2008	u	ppm	0.2
Blank-Phosphate	1/31/2008	u	ppm	0.2

u: Compound not detected above Practical Quantitation Limit (PQL).

Calibration Verification Summary: Anions

Check Standard recoveries:

Sample:	Date	Std ppm	Obs ppm	% recovery
Fluoride check	2/7/2008	5.00	5.5	109.4
			Control Limits: 98.6-121.8	
Chloride check	2/7/2008	5.00	5.6	111.0
			Control Limits: 81.8-110.9	
Nitrite check	2/7/2008	5.00	5.22	104.4
			Control Limits: 80.8-128.5	
Sulfate check	2/7/2008	5.00	5.76	115.2
			Control Limits: 80.5-122.3	
Bromide check	2/7/2008	5.00	5.6	112.1
			Control Limits: 75.6-109.2	
Nitrate check	2/7/2008	5.00	5.4	108.8
			Control Limits: 82.2-117.5	
Chlorate check	2/7/2008	5.00	5.724	114.5
			Control Limits: 73.0-108.3	
Phosphate check	2/7/2008	5.00	5.09	101.8
			Control Limits: 80.2-120.9	

QC Check:

Sample:	Date	Std ppm	Obs ppm	% recovery
QC Check-Fluoride	2/7/2008	25.0	27.5	110.0
QC Check-Chloride	2/7/2008	50.0	56.05	112.1
QC Check-Nitrite	2/7/2008	15.0	16.42	109.5
QC Check-Sulfate	2/7/2008	50.0	55.8	111.6
QC Check-Bromide	2/7/2008	50.0	56.9	113.8
QC Check-Nitrate	2/7/2008	11.0	12.5	113.2
QC Check-Phosphate	2/7/2008	16.0	17.4	108.8

Control Limits: 80.0-120.0%

Method Blank Summary: Anions

Sample	Date	Concentration	Units	PQL
Blank-Fluoride	2/7/2008	u	ppm	0.2
Blank-Chloride	2/7/2008	u	ppm	0.2
Blank-Nitrite	2/7/2008	u	ppm	0.2
Blank-Sulfate	2/7/2008	u	ppm	0.2
Blank-Bromide	2/7/2008	u	ppm	0.2
Blank-Nitrate	2/7/2008	u	ppm	0.2
Blank-Chlroate	2/7/2008	u	ppm	0.2
Blank-Phosphate	2/7/2008	u	ppm	0.2

u: Compound not detected above Practical Quantitation Limit (PQL).

Method Duplicates Summary: Anions

Sample:	Batch MS/MSD	7886-20		
	Date	MS Result	MSD Result	Units
Fluoride MS/MSD	2/1/2008	1,108.0	1,034.0	mg/L
		% RPD= 6.9%		% Max RPD= 11.0%
Chloride MS/MSD	2/1/2008	1,264.0	1,215.0	mg/L
		% RPD= 4.0%		% Max RPD= 5.3%
Nitrite MS/MSD	2/1/2008	1,072.0	1,038.0	mg/L
		% RPD= 3.2%		% Max RPD= 3.9%
Sulfate MS/MSD	2/1/2008	1,326.0	1,236.0	mg/L
		% RPD= 7.0%		% Max RPD= 10.1%
Bromide MS/MSD	2/1/2008	961.5	876.6	mg/L
		% RPD= 9.2%		% Max RPD= 9.6%
Nitrate MS/MSD	2/1/2008	998.5	959.5	mg/L
		% RPD= 4.0%		% Max RPD= 10.6%
Chlorate MS/MSD	2/1/2008	1,110.0	1,050.0	mg/L
		% RPD= 5.6%		% Max RPD= 10.5%
Phosphate MS/MSD	2/1/2008	991.4	1,013.0	mg/L
		% RPD= 2.2%		% Max RPD= 13.0%

Method Spike Summary: Anions

Sample:	Batch MS/MSD	7886-20		
	Date	MS Recovery	MSD Recovery	Control Limits
Fluoride MS/MSD	2/1/2008	110.5%	103.1%	78.3-142.6%
Chloride MS/MSD	2/1/2008	104.5%	99.6%	75.5-128.1%
Nitrite MS/MSD	2/1/2008	107.2%	103.8%	75.7-140.1
Sulfate MS/MSD	2/1/2008	110.6%	101.6%	76.7-134.4
Bromide MS/MSD	2/1/2008	96.2%	87.7%	68.3-129.6%
Nitrate MS/MSD	2/1/2008	99.0%	95.1%	73.7-131.7
Chlorate MS/MSD	2/1/2008	111.0%	105.0%	68.3-116.6
Phosphate MS/MSD	2/1/2008	99.1%	101.3%	64.9-142.9

*poor matrix recovery due to matrix interfernence - beyond linear range

Method Duplicates Summary: Anions

Sample:	Batch MS/MSD	7886-22		
	Date	MS Result	MSD Result	Units
Fluoride MS/MSD	2/7/2008	565.1	567.2	mg/L
		% RPD= 0.4%		% Max RPD= 11.0%
Chloride MS/MSD	2/7/2008	646.5	648.6	mg/L
		% RPD= 0.3%		% Max RPD= 5.3%
Nitrite MS/MSD	2/7/2008	548.4	552.0	mg/L
		% RPD= 0.7%		% Max RPD= 3.9%
Sulfate MS/MSD	2/7/2008	753.6	754.8	mg/L
		% RPD= 0.2%		% Max RPD= 10.1%
Bromide MS/MSD	2/7/2008	572.0	569.9	mg/L
		% RPD= 0.4%		% Max RPD= 9.6%
Nitrate MS/MSD	2/7/2008	560.9	565.7	mg/L
		% RPD= 0.9%		% Max RPD= 10.6%
Chlorate MS/MSD	2/7/2008	701.7	704.2	mg/L
		% RPD= 0.4%		% Max RPD= 10.5%
Phosphate MS/MSD	2/7/2008	498.5	521.5	mg/L
		% RPD= 4.5%		% Max RPD= 13.0%

Method Spike Summary: Anions

Sample:	Batch MS/MSD	7886-22		
	Date	MS Recovery	MSD Recovery	Control Limits
Fluoride MS/MSD	2/7/2008	111.8%	112.3%	78.3-142.6%
Chloride MS/MSD	2/7/2008	111.1%	111.6%	75.5-128.1%
Nitrite MS/MSD	2/7/2008	109.7%	110.4%	75.7-140.1
Sulfate MS/MSD	2/7/2008	115.9%	116.1%	76.7-134.4
Bromide MS/MSD	2/7/2008	114.4%	114.0%	68.3-129.6%
Nitrate MS/MSD	2/7/2008	110.1%	111.1%	73.7-131.7
Chlorate MS/MSD	2/7/2008	127.9%	128.4%	68.3-116.6
Phosphate MS/MSD	2/7/2008	99.7%	104.3%	64.9-142.9

*poor matrix recovery due to matrix interfernence - beyond linear range

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Automated Report

New Jersey ACCUTEST Laboratories

IT'S ALL IN THE CHEMISTRY

08/24/10

Technical Report for

Shaw E & I, Inc.

ER-0435

117604/01010000 PO#345126

Accutest Job Number: J84702

Sampling Dates: 01/23/08 - 02/19/08

Report to:

Shaw E & I

jay.diebold@shawgrp.com

ATTN: Jay Diebold

Total number of pages in report: **115**

ACCREDITED IN ACCORDANCE WITH nelac

Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

David N. Speis
VP Ops, Laboratory Director

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Accutest Laboratories

Sample Summary

Shaw E & I, Inc.

Job No: J84702

ER-0435
Project No: 117604/01010000 PO#345126

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
J84702-1	02/19/08	00:00	03/04/08	SO	Soil	B4 HOMOGENIZED
J84702-2	01/23/08	14:45	03/04/08	SO	Soil	7881-5
J84702-3	01/23/08	14:00	03/04/08	SO	Soil	7881-1
J84702-4	01/24/08	11:35	03/04/08	SO	Soil	7886-1
J84702-5	01/25/08	08:10	03/04/08	SO	Soil	7886-10
J84702-6	01/25/08	09:00	03/04/08	SO	Soil	7886-14
J84702-7	01/24/08	10:40	03/04/08	SO	Soil	7881-17

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Shaw E & I, Inc. **Job No** J84702

Site: ER-0345 **Report Date** 3/17/2008 2:49:21 PM

On 03/04/2008, 7 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 3.8 C. Samples were intact and properly preserved, unless noted below. An Accutest Job Number of J84702 was assigned to the project. Laboratory sample ID, client sample ID and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

Metals By Method SW846 6010B

Matrix: SO **Batch ID:** MP42818

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J85081-1MS, J85081-1SDL, J85081-1MSD were used as the QC samples for metals.
- RPD(s) for Serial Dilution for Cadmium, Selenium are outside control limits for sample MP42818-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Matrix: SO **Batch ID:** MP42888

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J84702-7SDL, J84702-7MS, J84702-7MSD, J84702-7SDL were used as the QC samples for metals.
- Matrix Spike Recovery(s) for Barium are outside control limits. Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.
- RPD(s) for Serial Dilution for Arsenic, Cadmium are outside control limits for sample MP42888-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

Metals By Method SW846 7471A

Matrix: SO **Batch ID:** MP42805

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J84631-5MS, J84631-5MSD were used as the QC samples for metals.

Matrix: SO **Batch ID:** MP42872

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) J84702-7MS, J84702-7MSD were used as the QC samples for metals.

Wet Chemistry By Method EPA 160.3 M

Matrix: SO **Batch ID:** GN12874

- The data for EPA 160.3 M meets quality control requirements.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover

Sample Results

Report of Analysis

Accutest Laboratories

Report of Analysis

Client Sample ID:	B4 HOMOGENIZED		
Lab Sample ID:	J84702-1	**Date Sampled:**	02/19/08
Matrix:	SO - Soil	**Date Received:**	03/04/08
		Percent Solids:	85.8
Project:	ER-0435		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	8.1	2.4	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Barium	131	24	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 0.59	0.59	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Chromium	12.8	1.2	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Lead	8.2	2.4	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Mercury [a]	< 0.035	0.035	mg/kg	1	03/07/08	03/07/08	JW	SW846 7471A [1]	SW846 7471A [3]
Selenium	< 2.4	2.4	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Silver	< 1.2	1.2	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA20579
(2) Instrument QC Batch: MA20598
(3) Prep QC Batch: MP42805
(4) Prep QC Batch: MP42818

(a) Received and analyzed out of holding time.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	7881-5		
Lab Sample ID:	J84702-2	**Date Sampled:**	01/23/08
Matrix:	SO - Soil	**Date Received:**	03/04/08
		Percent Solids:	84.6
Project:	ER-0435		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	18.7	2.4	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Barium	137	24	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 0.60	0.60	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Chromium	24.9	1.2	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Lead	6.4	2.4	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Mercury [a]	< 0.036	0.036	mg/kg	1	03/07/08	03/07/08	JW	SW846 7471A [1]	SW846 7471A [3]
Selenium	< 2.4	2.4	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Silver	< 1.2	1.2	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA20579
(2) Instrument QC Batch: MA20598
(3) Prep QC Batch: MP42805
(4) Prep QC Batch: MP42818

(a) Received and analyzed out of holding time.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	7881-1		
Lab Sample ID:	J84702-3	**Date Sampled:**	01/23/08
Matrix:	SO - Soil	**Date Received:**	03/04/08
		Percent Solids:	92.2
Project:	ER-0435		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	4.7	2.3	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Barium	619	23	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 0.57	0.57	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Chromium	18.6	1.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Lead	13.6	2.3	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Mercury [a]	< 0.033	0.033	mg/kg	1	03/07/08	03/07/08	JW	SW846 7471A [1]	SW846 7471A [3]
Selenium	< 2.3	2.3	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Silver	< 1.1	1.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA20579
(2) Instrument QC Batch: MA20598
(3) Prep QC Batch: MP42805
(4) Prep QC Batch: MP42818

(a) Received and analyzed out of holding time.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	7886-1		
Lab Sample ID:	J84702-4	**Date Sampled:**	01/24/08
Matrix:	SO - Soil	**Date Received:**	03/04/08
		Percent Solids:	67.6
Project:	ER-0435		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	20.9	3.0	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Barium	110	30	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 0.74	0.74	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Chromium	23.3	1.5	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Lead	7.0	3.0	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Mercury [a]	< 0.048	0.048	mg/kg	1	03/07/08	03/07/08	JW	SW846 7471A [1]	SW846 7471A [3]
Selenium	< 3.0	3.0	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Silver	< 1.5	1.5	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA20579
(2) Instrument QC Batch: MA20598
(3) Prep QC Batch: MP42805
(4) Prep QC Batch: MP42818

(a) Received and analyzed out of holding time.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	7886-10		
Lab Sample ID:	J84702-5	**Date Sampled:**	01/25/08
Matrix:	SO - Soil	**Date Received:**	03/04/08
		Percent Solids:	90.9
Project:	ER-0435		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	4.0	2.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Barium	166	21	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 0.53	0.53	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Chromium	12.7	1.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Lead	9.7	2.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Mercury [a]	< 0.035	0.035	mg/kg	1	03/07/08	03/07/08	JW	SW846 7471A [1]	SW846 7471A [3]
Selenium	< 2.1	2.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Silver	< 1.1	1.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA20579
(2) Instrument QC Batch: MA20598
(3) Prep QC Batch: MP42805
(4) Prep QC Batch: MP42818

(a) Received and analyzed out of holding time.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	7886-14		
Lab Sample ID:	J84702-6	**Date Sampled:**	01/25/08
Matrix:	SO - Soil	**Date Received:**	03/04/08
		Percent Solids:	64.2
Project:	ER-0435		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	21.4	3.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Barium	95.0	31	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 0.77	0.77	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Chromium	28.3	1.5	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Lead	6.1	3.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Mercury [a]	< 0.048	0.048	mg/kg	1	03/07/08	03/07/08	JW	SW846 7471A [1]	SW846 7471A [3]
Selenium	< 3.1	3.1	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]
Silver	< 1.5	1.5	mg/kg	1	03/08/08	03/11/08	ND	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA20579
(2) Instrument QC Batch: MA20598
(3) Prep QC Batch: MP42805
(4) Prep QC Batch: MP42818

(a) Received and analyzed out of holding time.

RL = Reporting Limit

Accutest Laboratories

Report of Analysis

Client Sample ID:	7881-17		
Lab Sample ID:	J84702-7	**Date Sampled:**	01/24/08
Matrix:	SO - Soil	**Date Received:**	03/04/08
		Percent Solids:	92.3
Project:	ER-0435		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Arsenic	4.8	2.1	mg/kg	1	03/14/08	03/14/08	ND	SW846 6010B [2]	SW846 3050B [4]
Barium	212	21	mg/kg	1	03/14/08	03/14/08	ND	SW846 6010B [2]	SW846 3050B [4]
Cadmium	< 0.53	0.53	mg/kg	1	03/14/08	03/14/08	ND	SW846 6010B [2]	SW846 3050B [4]
Chromium	14.3	1.1	mg/kg	1	03/14/08	03/14/08	ND	SW846 6010B [2]	SW846 3050B [4]
Lead	8.6	2.1	mg/kg	1	03/14/08	03/14/08	ND	SW846 6010B [2]	SW846 3050B [4]
Mercury	< 0.035	0.035	mg/kg	1	03/13/08	03/13/08	JF	SW846 7471A [1]	SW846 7471A [3]
Selenium	< 2.1	2.1	mg/kg	1	03/14/08	03/14/08	ND	SW846 6010B [2]	SW846 3050B [4]
Silver	< 1.1	1.1	mg/kg	1	03/14/08	03/14/08	ND	SW846 6010B [2]	SW846 3050B [4]

(1) Instrument QC Batch: MA20605
(2) Instrument QC Batch: MA20616
(3) Prep QC Batch: MP42872
(4) Prep QC Batch: MP42888

RL = Reporting Limit

4

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- Sample Tracking Chronicle
- Internal Chain of Custody

17 Princess Rd
Lawrenceville, NJ 08648
609-895-5370/ 609-895-1858
Shaw Environmental and Infrastructure Inc.

SO

CHAIN OF CUSTODY

Ref. Document # J84702
Page 1 of 1

Project Number/Cost code: 117604 101010000
Project Name / Location: ER-0345 /
Purchase Order #: 345126

Project Contact: Streger/Diebold (Name & phone #)
Send Report To: ~~Streger/Diebold~~ / Randi Rothenal
Phone/Fax Number: as Above
Address:
City/State:

Shipment Date:
Waybill/Airbill Number:
Lab Destination: Accutest
Lab Contact Name / ph. #: Randi Rothenal 609-895-5370

Sampler's Name(s):

Lab No.	Sample ID Number	Sample Description	Collection Information Date	Time	G/C	Matrix	# of containers	Container size	Preservative HCL	NaOH	HNO_3	H_2SO_4	Ice	None	RCRA Metals							Solids % Any Additional Information	Turn Around Time Requested
-1	B4 Homogenized		2.19.08			Soil	1	2 oz.						X	X								Mon
-2	7881-5	B3-25'	1.23.08	1445			1	2oz							X							83%	
-3	7881-1	B3-5'	1	1400											X							91.7%	
-4	7886-1	B5-25'	1.24.08	1135											X							87.4%	
-5	7886-10	SB1-5'	1.25.08	810											X							89.0%	
	[redacted]														X								
-6	7886-14	SB1-25'	1.25.08	900											X							86.4%	
NOT Rec'd	7881-17	B5-5'	1.24.08	1040											X							90.0%	
"			HOLD MS/MSD P. WED MW - WILL SHIP MISSING SAMPLE																				
			FOR NEXT WEEK. MW 3.7.08																				

Special Instructions:

Known Waste Stream Circle:
RCRA PCB/dioxin PAH/oil RAD Corrosive Flammable Reactive
QC/Data Package Level Required:
I II (III) IV NJ EDD GIS EDD Preliminary data

G/C Codes: C = Composite (ME39) G = Grab

QC Package Codes
Level I = data summary
Level II = data summary + basic QC
Level III = New Jersey QC reduced deliverable
Level IV = Full deliverable CLP package

Cooler temperature upon arrival at Lab: 38°

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
[signature]	2.19.08	1400	Randi Rothenal	2/19/08	1600
[signature]	3/3/08	1330	FedX	3/3/08	1330
FedX	3/4/08	1030	PDon	3/4/08	1030

2A

TKS

J84702: Chain of Custody
Page 1 of 1

Internal Sample Tracking Chronicle

Shaw E & I, Inc.

Job No: J84702

ER-0435
Project No: 117604/01010000 PO#345126

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
J84702-1	Collected: 19-FEB-08 00:00 By:		Received: 04-MAR-08 By:			
B4 HOMOGENIZED						
J84702-1	SW846 7471A	07-MAR-08 13:58	JW	07-MAR-08	JW	HG
J84702-1	SW846 6010B	11-MAR-08 12:27	ND	08-MAR-08	WP	AG,AS,BA,CD,CR,PB,SE
J84702-1	EPA 160.3 M	14-MAR-08	NS			%SOL
J84702-2	Collected: 23-JAN-08 14:45 By:		Received: 04-MAR-08 By:			
7881-5						
J84702-2	SW846 7471A	07-MAR-08 13:59	JW	07-MAR-08	JW	HG
J84702-2	SW846 6010B	11-MAR-08 12:33	ND	08-MAR-08	WP	AG,AS,BA,CD,CR,PB,SE
J84702-2	EPA 160.3 M	14-MAR-08	NS			%SOL
J84702-3	Collected: 23-JAN-08 14:00 By:		Received: 04-MAR-08 By:			
7881-1						
J84702-3	SW846 7471A	07-MAR-08 14:00	JW	07-MAR-08	JW	HG
J84702-3	SW846 6010B	11-MAR-08 12:39	ND	08-MAR-08	WP	AG,AS,BA,CD,CR,PB,SE
J84702-3	EPA 160.3 M	14-MAR-08	NS			%SOL
J84702-4	Collected: 24-JAN-08 11:35 By:		Received: 04-MAR-08 By:			
7886-1						
J84702-4	SW846 7471A	07-MAR-08 14:01	JW	07-MAR-08	JW	HG
J84702-4	SW846 6010B	11-MAR-08 13:04	ND	08-MAR-08	WP	AG,AS,BA,CD,CR,PB,SE
J84702-4	EPA 160.3 M	14-MAR-08	NS			%SOL
J84702-5	Collected: 25-JAN-08 08:10 By:		Received: 04-MAR-08 By:			
7886-10						
J84702-5	SW846 7471A	07-MAR-08 14:02	JW	07-MAR-08	JW	HG
J84702-5	SW846 6010B	11-MAR-08 13:10	ND	08-MAR-08	WP	AG,AS,BA,CD,CR,PB,SE
J84702-5	EPA 160.3 M	14-MAR-08	NS			%SOL
J84702-6	Collected: 25-JAN-08 09:00 By:		Received: 04-MAR-08 By:			
7886-14						
J84702-6	SW846 7471A	07-MAR-08 14:04	JW	07-MAR-08	JW	HG
J84702-6	SW846 6010B	11-MAR-08 13:16	ND	08-MAR-08	WP	AG,AS,BA,CD,CR,PB,SE

Internal Sample Tracking Chronicle

Shaw E & I, Inc.

Job No: J84702

ER-0435
Project No: 117604/01010000 PO#345126

Sample Number	Method	Analyzed	By	Prepped	By	Test Codes
J84702-6	EPA 160.3 M	14-MAR-08	NS			%SOL
J84702-7 7881-17	Collected: 24-JAN-08 10:40 By:		Received: 04-MAR-08 By:			
J84702-7	SW846 7471A	13-MAR-08 11:35	JF	13-MAR-08	JF	HG
J84702-7	EPA 160.3 M	14-MAR-08	NS			%SOL
J84702-7	SW846 6010B	14-MAR-08 20:48	ND	14-MAR-08	JF	AG,AS,BA,CD,CR,PB,SE

Accutest Internal Chain of Custody

Job Number: J84702
Account: SHAWNJL Shaw E & I, Inc.
Project: ER-0435
Received: 03/04/08

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
J84702-1.1	Secured Storage	John Thomas	03/06/08 08:04	Retrieve from Storage
J84702-1.1	John Thomas	Joshua Frenkel	03/06/08 08:06	Custody Transfer
J84702-1.1	Joshua Frenkel	Teresa Guziak	03/06/08 09:54	Custody Transfer
J84702-1.1	Teresa Guziak	Secured Storage	03/06/08 12:43	Return to Storage
J84702-1.1	Secured Storage	Todd Shoemaker	03/07/08 08:18	Retrieve from Storage
J84702-1.1	Todd Shoemaker	Jieyu Wang	03/07/08 08:19	Custody Transfer
J84702-1.1	Jieyu Wang	Secured Storage	03/07/08 16:27	Return to Storage
J84702-1.1	Secured Storage	Wally Pimental	03/08/08 07:04	Retrieve from Storage
J84702-1.1	Wally Pimental	Secured Storage	03/08/08 09:09	Return to Storage
J84702-1.1	Secured Storage	John Thomas	03/14/08 13:38	Retrieve from Storage
J84702-1.1	John Thomas	Niyati Shah	03/14/08 13:42	Custody Transfer
J84702-1.1	Niyati Shah	Secured Storage	03/14/08 18:39	Return to Storage
J84702-1.1	Dave Hunkele		04/07/08 06:09	Disposed
J84702-1.1.1	Wally Pimental	Metals Digestion	03/08/08 09:07	Digestate from J84702-1.1
J84702-1.1.1	Metals Digestion	Wally Pimental	03/08/08 12:03	Digestate from J84702-1.1
J84702-1.1.1	Wally Pimental	Metals Digestate Storage	03/08/08 12:03	Return to Storage
J84702-1.1.1	Metals Digestate Storage	Veronica Chandra	03/11/08 12:18	Retrieve from Storage
J84702-1.1.1	Veronica Chandra	Metals Digestate Storage	03/11/08 12:19	Return to Storage
J84702-1.1.1	Metals Digestate Storage	Veronica Chandra	03/12/08 15:35	Retrieve from Storage
J84702-1.1.1	Veronica Chandra	Metals Digestate Storage	03/12/08 16:21	Return to Storage
J84702-1.1.1	Metals Digestate Storage		05/15/08 09:00	Disposed
J84702-2.1	Secured Storage	John Thomas	03/06/08 08:04	Retrieve from Storage
J84702-2.1	John Thomas	Joshua Frenkel	03/06/08 08:06	Custody Transfer
J84702-2.1	Joshua Frenkel	Teresa Guziak	03/06/08 09:54	Custody Transfer
J84702-2.1	Teresa Guziak	Secured Storage	03/06/08 12:43	Return to Storage
J84702-2.1	Secured Storage	Todd Shoemaker	03/07/08 08:18	Retrieve from Storage
J84702-2.1	Todd Shoemaker	Jieyu Wang	03/07/08 08:19	Custody Transfer
J84702-2.1	Jieyu Wang	Secured Storage	03/07/08 16:27	Return to Storage
J84702-2.1	Secured Storage	Wally Pimental	03/08/08 07:04	Retrieve from Storage
J84702-2.1	Wally Pimental	Secured Storage	03/08/08 09:09	Return to Storage
J84702-2.1	Secured Storage	John Thomas	03/14/08 13:38	Retrieve from Storage
J84702-2.1	John Thomas	Niyati Shah	03/14/08 13:42	Custody Transfer
J84702-2.1	Niyati Shah	Secured Storage	03/14/08 18:39	Return to Storage
J84702-2.1	Dave Hunkele		04/07/08 06:09	Disposed
J84702-2.1.1	Wally Pimental	Metals Digestion	03/08/08 09:07	Digestate from J84702-2.1
J84702-2.1.1	Metals Digestion	Wally Pimental	03/08/08 12:03	Digestate from J84702-2.1
J84702-2.1.1	Wally Pimental	Metals Digestate Storage	03/08/08 12:03	Return to Storage
J84702-2.1.1	Metals Digestate Storage	Veronica Chandra	03/11/08 12:18	Retrieve from Storage
J84702-2.1.1	Veronica Chandra	Metals Digestate Storage	03/11/08 12:19	Return to Storage
J84702-2.1.1	Metals Digestate Storage	Veronica Chandra	03/12/08 15:35	Retrieve from Storage
J84702-2.1.1	Veronica Chandra	Metals Digestate Storage	03/12/08 16:21	Return to Storage

Accutest Internal Chain of Custody

Job Number: J84702
Account: SHAWNJL Shaw E & I, Inc.
Project: ER-0435
Received: 03/04/08

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
J84702-2.1.1	Metals Digestate Storage		05/15/08 09:00	Disposed
J84702-3.1	Secured Storage	John Thomas	03/06/08 08:04	Retrieve from Storage
J84702-3.1	John Thomas	Joshua Frenkel	03/06/08 08:06	Custody Transfer
J84702-3.1	Joshua Frenkel	Teresa Guziak	03/06/08 09:54	Custody Transfer
J84702-3.1	Teresa Guziak	Secured Storage	03/06/08 12:43	Return to Storage
J84702-3.1	Secured Storage	Todd Shoemaker	03/07/08 08:18	Retrieve from Storage
J84702-3.1	Todd Shoemaker	Jieyu Wang	03/07/08 08:19	Custody Transfer
J84702-3.1	Jieyu Wang	Secured Storage	03/07/08 16:27	Return to Storage
J84702-3.1	Secured Storage	Wally Pimental	03/08/08 07:04	Retrieve from Storage
J84702-3.1	Wally Pimental	Secured Storage	03/08/08 09:09	Return to Storage
J84702-3.1	Secured Storage	John Thomas	03/14/08 13:38	Retrieve from Storage
J84702-3.1	John Thomas	Niyati Shah	03/14/08 13:42	Custody Transfer
J84702-3.1	Niyati Shah	Secured Storage	03/14/08 18:39	Return to Storage
J84702-3.1	Dave Hunkele		04/07/08 06:09	Disposed
J84702-3.1.1	Wally Pimental	Metals Digestion	03/08/08 09:07	Digestate from J84702-3.1
J84702-3.1.1	Metals Digestion	Wally Pimental	03/08/08 12:03	Digestate from J84702-3.1
J84702-3.1.1	Wally Pimental	Metals Digestate Storage	03/08/08 12:03	Return to Storage
J84702-3.1.1	Metals Digestate Storage	Veronica Chandra	03/11/08 12:18	Retrieve from Storage
J84702-3.1.1	Veronica Chandra	Metals Digestate Storage	03/11/08 12:19	Return to Storage
J84702-3.1.1	Metals Digestate Storage	Veronica Chandra	03/12/08 15:35	Retrieve from Storage
J84702-3.1.1	Veronica Chandra	Metals Digestate Storage	03/12/08 16:21	Return to Storage
J84702-3.1.1	Metals Digestate Storage		05/15/08 09:00	Disposed
J84702-4.1	Secured Storage	John Thomas	03/06/08 08:04	Retrieve from Storage
J84702-4.1	John Thomas	Joshua Frenkel	03/06/08 08:06	Custody Transfer
J84702-4.1	Joshua Frenkel	Teresa Guziak	03/06/08 09:54	Custody Transfer
J84702-4.1	Teresa Guziak	Secured Storage	03/06/08 12:43	Return to Storage
J84702-4.1	Secured Storage	Todd Shoemaker	03/07/08 08:18	Retrieve from Storage
J84702-4.1	Todd Shoemaker	Jieyu Wang	03/07/08 08:19	Custody Transfer
J84702-4.1	Jieyu Wang	Secured Storage	03/07/08 16:27	Return to Storage
J84702-4.1	Secured Storage	Wally Pimental	03/08/08 07:04	Retrieve from Storage
J84702-4.1	Wally Pimental	Secured Storage	03/08/08 09:09	Return to Storage
J84702-4.1	Secured Storage	John Thomas	03/14/08 13:38	Retrieve from Storage
J84702-4.1	John Thomas	Niyati Shah	03/14/08 13:42	Custody Transfer
J84702-4.1	Niyati Shah	Secured Storage	03/14/08 18:39	Return to Storage
J84702-4.1	Dave Hunkele		04/07/08 06:09	Disposed
J84702-4.1.1	Wally Pimental	Metals Digestion	03/08/08 09:07	Digestate from J84702-4.1
J84702-4.1.1	Metals Digestion	Wally Pimental	03/08/08 12:03	Digestate from J84702-4.1
J84702-4.1.1	Wally Pimental	Metals Digestate Storage	03/08/08 12:03	Return to Storage
J84702-4.1.1	Metals Digestate Storage	Veronica Chandra	03/11/08 12:18	Retrieve from Storage
J84702-4.1.1	Veronica Chandra	Metals Digestate Storage	03/11/08 12:19	Return to Storage

Accutest Internal Chain of Custody

Job Number: J84702
Account: SHAWNJL Shaw E & I, Inc.
Project: ER-0435
Received: 03/04/08

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
J84702-4.1.1	Metals Digestate Storage	Veronica Chandra	03/12/08 15:35	Retrieve from Storage
J84702-4.1.1	Veronica Chandra	Metals Digestate Storage	03/12/08 16:21	Return to Storage
J84702-4.1.1	Metals Digestate Storage		05/15/08 09:00	Disposed
J84702-5.1	Secured Storage	John Thomas	03/06/08 08:04	Retrieve from Storage
J84702-5.1	John Thomas	Joshua Frenkel	03/06/08 08:06	Custody Transfer
J84702-5.1	Joshua Frenkel	Teresa Guziak	03/06/08 09:54	Custody Transfer
J84702-5.1	Teresa Guziak	Secured Storage	03/06/08 12:43	Return to Storage
J84702-5.1	Secured Storage	Todd Shoemaker	03/07/08 08:18	Retrieve from Storage
J84702-5.1	Todd Shoemaker	Jieyu Wang	03/07/08 08:19	Custody Transfer
J84702-5.1	Jieyu Wang	Secured Storage	03/07/08 16:27	Return to Storage
J84702-5.1	Secured Storage	Wally Pimental	03/08/08 07:04	Retrieve from Storage
J84702-5.1	Wally Pimental	Secured Storage	03/08/08 09:09	Return to Storage
J84702-5.1	Secured Storage	John Thomas	03/14/08 13:38	Retrieve from Storage
J84702-5.1	John Thomas	Niyati Shah	03/14/08 13:42	Custody Transfer
J84702-5.1	Niyati Shah	Secured Storage	03/14/08 18:39	Return to Storage
J84702-5.1	Dave Hunkele		04/07/08 06:09	Disposed
J84702-5.1.1	Wally Pimental	Metals Digestion	03/08/08 09:07	Digestate from J84702-5.1
J84702-5.1.1	Metals Digestion	Wally Pimental	03/08/08 12:03	Digestate from J84702-5.1
J84702-5.1.1	Wally Pimental	Metals Digestate Storage	03/08/08 12:03	Return to Storage
J84702-5.1.1	Metals Digestate Storage	Veronica Chandra	03/11/08 12:18	Retrieve from Storage
J84702-5.1.1	Veronica Chandra	Metals Digestate Storage	03/11/08 12:19	Return to Storage
J84702-5.1.1	Metals Digestate Storage	Veronica Chandra	03/12/08 15:35	Retrieve from Storage
J84702-5.1.1	Veronica Chandra	Metals Digestate Storage	03/12/08 16:21	Return to Storage
J84702-5.1.1	Metals Digestate Storage		05/15/08 09:00	Disposed
J84702-6.1	Secured Storage	John Thomas	03/06/08 08:04	Retrieve from Storage
J84702-6.1	John Thomas	Joshua Frenkel	03/06/08 08:06	Custody Transfer
J84702-6.1	Joshua Frenkel	Teresa Guziak	03/06/08 09:54	Custody Transfer
J84702-6.1	Teresa Guziak	Secured Storage	03/06/08 12:43	Return to Storage
J84702-6.1	Secured Storage	Todd Shoemaker	03/07/08 08:18	Retrieve from Storage
J84702-6.1	Todd Shoemaker	Jieyu Wang	03/07/08 08:19	Custody Transfer
J84702-6.1	Jieyu Wang	Secured Storage	03/07/08 16:27	Return to Storage
J84702-6.1	Secured Storage	Wally Pimental	03/08/08 07:04	Retrieve from Storage
J84702-6.1	Wally Pimental	Secured Storage	03/08/08 09:09	Return to Storage
J84702-6.1	Secured Storage	John Thomas	03/14/08 13:38	Retrieve from Storage
J84702-6.1	John Thomas	Niyati Shah	03/14/08 13:42	Custody Transfer
J84702-6.1	Niyati Shah	Secured Storage	03/14/08 15:55	Return to Storage
J84702-6.1	Dave Hunkele		04/07/08 06:09	Disposed
J84702-6.1.1	Wally Pimental	Metals Digestion	03/08/08 09:07	Digestate from J84702-6.1
J84702-6.1.1	Metals Digestion	Wally Pimental	03/08/08 12:03	Digestate from J84702-6.1
J84702-6.1.1	Wally Pimental	Metals Digestate Storage	03/08/08 12:03	Return to Storage

Accutest Internal Chain of Custody

Job Number: J84702
Account: SHAWNJL Shaw E & I, Inc.
Project: ER-0435
Received: 03/04/08

Sample.Bottle Number	Transfer FROM	Transfer TO	Date/Time	Reason
J84702-6.1.1	Metals Digestate Storage	Veronica Chandra	03/11/08 12:18	Retrieve from Storage
J84702-6.1.1	Veronica Chandra	Metals Digestate Storage	03/11/08 12:19	Return to Storage
J84702-6.1.1	Metals Digestate Storage	Veronica Chandra	03/12/08 15:35	Retrieve from Storage
J84702-6.1.1	Veronica Chandra	Metals Digestate Storage	03/12/08 16:21	Return to Storage
J84702-6.1.1	Metals Digestate Storage		05/15/08 09:00	Disposed
J84702-7.1	Secured Storage	Adam Scott	03/13/08 08:30	Retrieve from Storage
J84702-7.1	Adam Scott	Joshua Frenkel	03/13/08 08:32	Custody Transfer
J84702-7.1	Joshua Frenkel	Secured Storage	03/13/08 10:37	Return to Storage
J84702-7.1	Secured Storage	Adam Scott	03/14/08 07:29	Retrieve from Storage
J84702-7.1	Adam Scott	Joshua Frenkel	03/14/08 08:06	Custody Transfer
J84702-7.1	Joshua Frenkel	Secured Storage	03/14/08 13:08	Return to Storage
J84702-7.1	Secured Storage	John Thomas	03/14/08 13:38	Retrieve from Storage
J84702-7.1	John Thomas	Niyati Shah	03/14/08 13:42	Custody Transfer
J84702-7.1	Niyati Shah	Secured Storage	03/14/08 18:39	Return to Storage
J84702-7.1	Dave Hunkele		04/07/08 06:09	Disposed
J84702-7.1.1	Joshua Frenkel	Metals Digestion	03/14/08 11:41	Digestate from J84702-7.1
J84702-7.1.1	Metals Digestion	Joshua Frenkel	03/14/08 13:06	Digestate from J84702-7.1
J84702-7.1.1	Joshua Frenkel	Metals Digestate Storage	03/14/08 13:06	Return to Storage
J84702-7.1.1	Metals Digestate Storage	Veronica Chandra	03/14/08 14:49	Retrieve from Storage
J84702-7.1.1	Wei Zhou	Metals Digestate Storage	03/17/08 08:07	Return to Storage
Bottle was returned to secure storage, but inadvertently not scanned.				
J84702-7.1.1	Metals Digestate Storage	Veronica Chandra	03/17/08 13:19	Retrieve from Storage
J84702-7.1.1	Veronica Chandra	Metals Digestate Storage	03/17/08 16:55	Return to Storage
J84702-7.1.1	Metals Digestate Storage		05/21/08 09:00	Disposed

Metals Analysis

QC Data Summaries

Includes the following where applicable:

- Instrument Runlogs
- Initial and Continuing Calibration Blanks
- Initial and Continuing Calibration Checks
- High and Low Check Standards
- Interfering Element Check Standards
- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
Analyst: JW Run ID: MA20579
Parameters: Hg

Time	Sample Description	Dilution Factor	PS Recov	Comments
12:25	MA20579-STD1	1		R=0.999924, B=9.5597e-5, C=-8.38219e-2.
12:27	MA20579-STD2	1		STD02REP1
12:28	MA20579-STD3	1		STD03REP1
12:30	MA20579-STD4	1		STD04REP1
12:31	MA20579-STD5	1		STD05REP1
12:32	MA20579-STD6	1		STD06REP1
12:42	MA20579-STD7	1		STD04REP1
12:49	MA20579-ICV1	1		
12:50	MA20579-ICB1	1		
12:51	MA20579-CCV1	1		
12:53	MA20579-CCB1	1		
12:54	MA20579-CRI1	1		
12:55	MP42804-MB1	1		
12:56	MP42804-LC1	1		
12:58	MP42804-S1	1		
12:59	MP42804-S2	1		
13:00	J84556-3	1		(sample used for QC only; not part of login J84702)
13:02	ZZZZZZ	1		
13:04	ZZZZZZ	1		
13:05	ZZZZZZ	1		
13:06	ZZZZZZ	1		
13:08	MA20579-CCV2	1		
13:09	MA20579-CCB2	1		
13:11	ZZZZZZ	1		
13:12	ZZZZZZ	1		
13:13	ZZZZZZ	1		
13:15	ZZZZZZ	1		
13:16	ZZZZZZ	1		
13:17	ZZZZZZ	1		
13:18	ZZZZZZ	1		
13:19	ZZZZZZ	1		
13:21	ZZZZZZ	1		
13:22	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
Analyst: JW Run ID: MA20579
Parameters: Hg

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:23	MA20579-CCV3	1		
13:24	MA20579-CCB3	1		
13:26	ZZZZZZ	1		
13:27	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:30	ZZZZZZ	1		
13:32	ZZZZZZ	1		
13:33	MP42805-MB1	1		
13:34	MP42805-LC1	1		
13:35	MP42805-S1	1		Overrange.
13:36	MP42805-S2	1		Overrange.
13:38	J84631-5	1		(sample used for QC only; not part of login J84702)
13:39	MA20579-CCV4	1		
13:40	MA20579-CCB4	1		
13:41	ZZZZZZ	1		
13:42	ZZZZZZ	1		
13:44	ZZZZZZ	1		
13:45	ZZZZZZ	1		
13:46	ZZZZZZ	1		
13:48	ZZZZZZ	1		
13:49	ZZZZZZ	1		
13:50	ZZZZZZ	1		
13:52	ZZZZZZ	1		
13:53	ZZZZZZ	1		
13:54	MA20579-CCV5	1		
13:55	MA20579-CCB5	1		
13:57	ZZZZZZ	1		
13:58	J84702-1	1		
13:59	J84702-2	1		
14:00	J84702-3	1		
14:01	J84702-4	1		
14:02	J84702-5	1		
14:04	J84702-6	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
Analyst: JW Run ID: MA20579
Parameters: Hg

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	14:05	ZZZZZZ	1		
	14:06	ZZZZZZ	1		
	14:07	MA20579-CCV6	1		
	14:08	MA20579-CCB6	1		
	14:33	MP42805-S1	2		
	14:34	MP42805-S2	2		
---------->	Last reportable sample/prep for job J84702				
	14:35	ZZZZZZ	10		
	14:36	MA20579-CCV7	1		
	14:38	MA20579-CCB7	1		
---------->	Last reportable CCB for job J84702				
	Refer to raw data for calibration curve and standards.				

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
QC Limits: result < RL Run ID: MA20579 Units: ug/l

Time:			12:50		12:53		13:09		13:24	
Sample ID:			ICB1		CCB1		CCB2		CCB3	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Mercury	0.20	.091	0.010	<0.20	-0.076	<0.20	0.020	<0.20	-0.049	<0.20

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
QC Limits: result < RL Run ID: MA20579 Units: ug/l

Time:			13:40		13:55		14:08		14:38	
Sample ID:			CCB4		CCB5		CCB6		CCB7	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Mercury	0.20	.091	-0.049	<0.20	-0.030	<0.20	-0.061	<0.20	-0.017	<0.20

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
QC Limits: 90 to 110 % Recovery Run ID: MA20579 Units: ug/l

Time:		12:49			12:51			13:08	
Sample ID:	ICV	ICV1		CCV	CCV1		CCV	CCV2	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Mercury	3	2.9	96.7	2.5	2.4	96.0	2.5	2.4	96.0

(*) Outside of QC limits
(anr) Analyte not requested

Page 1

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
QC Limits: 90 to 110 % Recovery Run ID: MA20579 Units: ug/l

Time:		13:23			13:39			13:54	
Sample ID:	CCV	CCV3		CCV	CCV4		CCV	CCV5	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Mercury	2.5	2.3	92.0	2.5	2.3	92.0	2.5	2.3	92.0

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
QC Limits: 90 to 110 % Recovery Run ID: MA20579 Units: ug/l

Time:		14:07			14:36	
Sample ID:	CCV	CCV6		CCV	CCV7	
Metal	True	Results	% Rec	True	Results	% Rec
Mercury	2.5	2.3	92.0	2.5	2.3	92.0

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10307S1.PRN Date Analyzed: 03/07/08 Methods: SW846 7471A
QC Limits: 50 to 150 % Recovery Run ID: MA20579 Units: ug/l

Time:			12:54	
Sample ID:	CRI	CRIA	CRI1	
Metal	True	True	Results	% Rec
Mercury	0.20		0.16	80.0

(*) Outside of QC limits
(anr) Analyte not requested

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
09:25	MA20598-STD1	1		STDA
09:32	MA20598-STD2	1		STDB
09:38	MA20598-CCV1	1		
09:44	MA20598-CCB1	1		
09:53	MA20598-STD3	1		STDA
10:00	MA20598-CCB2	1		
10:07	MA20598-CCB3	1		
10:14	MA20598-HSTD1	1		
10:21	MA20598-CRIB1	1		
10:27	MA20598-CRIA1	1		
10:34	MA20598-ICV1	1		
10:45	MA20598-ICB1	1		
10:51	MA20598-ICCV1	1		
11:01	MA20598-CCB4	1		
11:09	MA20598-ICSA1	1		
11:17	MA20598-ICSA2	1		
11:24	MA20598-ICSAB1	1		
11:31	MA20598-CCV2	1		
11:37	MA20598-CCB5	1		
11:43	MP42818-MB1	1		
11:49	MP42818-B1	1		
11:55	MP42818-LC1	1		
12:01	MP42818-S1	1		
12:08	MP42818-S2	1		Fe=560ppm
12:14	J85081-1	1		(sample used for QC only; not part of login J84702)
12:20	MP42818-SD1	5		
12:27	J84702-1	1		%sol
12:33	J84702-2	1		%sol
12:39	J84702-3	1		%sol
12:45	MA20598-CCV3	1		Each replicate has recoveries within limits.
12:52	MA20598-CCB6	1		
12:58	MP42832-LC1	1		
13:04	J84702-4	1		%sol

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:10	J84702-5	1		%sol
13:16	J84702-6	1		Ca overrange, but not enough interference.
13:23	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:35	ZZZZZZ	1		
13:41	ZZZZZZ	1		
13:47	ZZZZZZ	1		
13:53	ZZZZZZ	1		
14:00	MA20598-CCV4	1		
14:06	MA20598-CCB7	1		
14:12	ZZZZZZ	1		
14:18	ZZZZZZ	1		
14:24	ZZZZZZ	1		
14:31	ZZZZZZ	1		
14:37	ZZZZZZ	1		
14:43	ZZZZZZ	1		
14:49	ZZZZZZ	1		
14:56	ZZZZZZ	1		
15:02	MP42829-LC1	1		
15:08	MA20598-CCV5	1		
15:14	MA20598-CCB8	1		
15:20	ZZZZZZ	1		
15:27	MP42828-B1	1		
15:33	ZZZZZZ	1		
15:39	MP42828-S1	1		
15:45	MP42828-S2	1		
15:51	J85137-6	1		(sample used for QC only; not part of login J84702)
15:57	MP42828-SD1	5		
16:03	ZZZZZZ	1		
16:10	ZZZZZZ	1		
16:16	MA20598-CCV6	1		
16:22	MA20598-CCB9	1		
16:28	MA20598-ICSA3	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
16:35	MA20598-ICSAB2	1		
16:42	MA20598-CCV7	1		
16:48	MA20598-CCB10	1		
16:54	ZZZZZZ	1		
17:01	ZZZZZZ	1		
17:07	ZZZZZZ	1		
17:13	ZZZZZZ	1		
17:19	ZZZZZZ	1		
17:25	ZZZZZZ	1		
17:31	ZZZZZZ	1		
17:37	ZZZZZZ	1		
17:44	ZZZZZZ	1		
17:50	ZZZZZZ	1		
17:56	MA20598-CCV8	1		
18:02	MA20598-CCB11	1		
18:12	MA20598-CCV9	1		
18:20	MA20598-CCB12	1		
18:27	ZZZZZZ	1		
18:33	ZZZZZZ	1		
18:39	ZZZZZZ	1		
18:46	ZZZZZZ	1		
18:52	ZZZZZZ	1		
18:58	ZZZZZZ	1		
19:04	MP42831-MB1	1		
19:10	MP42831-LC1	1		
19:16	MP42831-S1	1		
19:22	MP42831-S2	1		
19:29	MA20598-CCV10	1		
19:35	MA20598-CCB13	1		
19:41	MA20598-ICSA4	1		
19:47	MA20598-ICSAB3	1		
19:55	MA20598-CCV11	1		
20:01	MA20598-CCB14	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	20:08	J84877-1F	1		(sample used for QC only; not part of login J84702)
	20:14	MP42831-SD1	5		
	20:21	ZZZZZZ	1		
	20:27	ZZZZZZ	1		
	20:33	ZZZZZZ	1		
	20:39	ZZZZZZ	1		
	20:45	ZZZZZZ	1		
	20:51	MP42818-SD1	5		
---------->	Last reportable sample/prep for job J84702				
	20:58	MP42832-MB1	1		
	21:04	MA20598-CCV12	1		
	21:10	MA20598-CCB15	1		
	21:16	MP42832-B1	1		
	21:22	MP42832-S1	1		
	21:29	MP42832-S2	1		
	21:35	J85083-1	1		(sample used for QC only; not part of login J84702)
	21:41	MP42832-SD1	5		
	21:47	ZZZZZZ	1		
	21:54	ZZZZZZ	1		
	22:00	ZZZZZZ	2		
	22:06	ZZZZZZ	1		
	22:12	ZZZZZZ	1		
	22:18	MA20598-CCV13	1		
	22:24	MA20598-CCB16	1		
	22:31	ZZZZZZ	1		
	22:37	ZZZZZZ	1		
	22:43	ZZZZZZ	1		
	22:49	ZZZZZZ	1		
	22:56	ZZZZZZ	1		
	23:02	ZZZZZZ	1		
	23:08	ZZZZZZ	1		
	23:14	ZZZZZZ	1		
	23:21	ZZZZZZ	1		
	23:27	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
23:33	MA20598-CCV14	1		
23:39	MA20598-CCB17	1		
23:45	ZZZZZZ	1		
23:52	ZZZZZZ	1		
23:58	ZZZZZZ	1		
00:04	ZZZZZZ	1		
00:10	MP42852-MB1	1		
00:17	MP42852-LC1	1		
00:23	MP42852-S1	1		
00:29	MP42852-S2	1		
00:35	J84944-11	1		(sample used for QC only; not part of login J84702)
00:41	MP42852-SD1	5		
00:47	MA20598-CCV15	1		
00:54	MA20598-CCB18	1		
01:00	ZZZZZZ	5		
01:06	ZZZZZZ	1		
01:12	ZZZZZZ	1		
01:18	ZZZZZZ	1		
01:24	ZZZZZZ	1		
01:31	ZZZZZZ	1		
01:37	ZZZZZZ	1		
01:43	ZZZZZZ	1		
01:49	ZZZZZZ	1		
01:55	ZZZZZZ	1		
02:02	MA20598-CCV16	1		
02:08	MA20598-CCB19	1		
02:14	MA20598-ICSA5	1		
02:21	MA20598-ICSAB4	1		
02:27	MA20598-CCV17	1		
02:33	MA20598-CCB20	1		
---------->	Last reportable CCB for job J84702			
02:39	ZZZZZZ	1		
02:46	ZZZZZZ	1		
02:52	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
02:58	ZZZZZZ	1		
03:04	ZZZZZZ	1		
03:11	ZZZZZZ	1		
03:17	ZZZZZZ	1		
03:23	ZZZZZZ	1		
03:29	ZZZZZZ	1		
03:35	ZZZZZZ	2		
03:42	MA20598-CCV18	1		
03:48	MA20598-CCB21	1		
03:54	MP42851-MB1	1		
04:00	MP42851-LC1	1		
04:06	MP42851-S1	1		
04:12	MP42851-S2	1		
04:19	J84944-1	1		(sample used for QC only; not part of login J84702)
04:25	MP42851-SD1	5		
04:31	ZZZZZZ	1		
04:37	ZZZZZZ	1		
04:44	ZZZZZZ	1		
04:50	ZZZZZZ	1		
04:56	MA20598-CCV19	1		
05:02	MA20598-CCB22	1		
05:08	ZZZZZZ	1		
05:15	ZZZZZZ	1		
05:21	ZZZZZZ	1		
05:27	ZZZZZZ	1		
05:33	ZZZZZZ	1		
05:40	ZZZZZZ	1		
05:46	ZZZZZZ	1		
05:52	ZZZZZZ	1		
05:58	ZZZZZZ	1		
06:04	ZZZZZZ	1		
06:11	MA20598-CCV20	1		
06:17	MA20598-CCB23	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
06:23	ZZZZZZ	1		
06:30	ZZZZZZ	1		
06:36	ZZZZZZ	1		
06:42	ZZZZZZ	1		
06:48	ZZZZZZ	1		
06:54	ZZZZZZ	1		
07:01	MA20598-CCV21	1		
07:07	MA20598-CCB24	1		
07:29	MA20598-ICSA6	1		
07:36	MA20598-ICSA7	1		
07:43	MA20598-ICSAB5	1		
07:51	MA20598-CCV22	1		
07:58	MA20598-CCB25	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
09:25	MA20598-STD1	2702 R	114070 R	39680 R	5844 R
09:32	MA20598-STD2	2534	110380	38562	5392
09:38	MA20598-CCV1	2590	113320	38831	5564
09:44	MA20598-CCB1	2645	114090	39517	5770
09:53	MA20598-STD3	2621	114060	39341	5722
10:00	MA20598-CCB2	2654	115540	39811	5777
10:07	MA20598-CCB3	2656	116970	39117	5783
10:14	MA20598-HSTD1	2549	107990	38762	5416
10:21	MA20598-CRIB1	2637	112170	38879	5729
10:27	MA20598-CRIA1	2668	113770	39775	5802
10:34	MA20598-ICV1	2652	113010	39280	5751
10:45	MA20598-ICB1	2646	113410	39160	5761
10:51	MA20598-ICCV1	2597	112090	39259	5576
11:01	MA20598-CCB4	2678	113700	38851	5815
11:09	MA20598-ICSA1	2360	106110	36428	4934
11:17	MA20598-ICSA2	2353	106250	36417	4917
11:24	MA20598-ICSAB1	2368	106410	37153	4948
11:31	MA20598-CCV2	2595	113140	38377	5568
11:37	MA20598-CCB5	2659	113450	39452	5796
11:43	MP42818-MB1	2626	113410	39510	5746
11:49	MP42818-B1	2624	111110	38727	5648
11:55	MP42818-LC1	2680	116800	40299	5625
12:01	MP42818-S1	2505	111470	38209	5195
12:08	MP42818-S2	2414	109720	37489	5104
12:14	J85081-1	2534	114070	38951	5251
12:20	MP42818-SD1	2582	999999 !	39142	5580
12:27	J84702-1	2649	112250	40298	5415
12:33	J84702-2	2487	113540	39231	5069
12:39	J84702-3	2679	118740	39950	5386
12:45	MA20598-CCV3	2587	109970	39002	5558
12:52	MA20598-CCB6	2639	114580	39132	5759
12:58	MP42832-LC1	2699	117320	40613	5628
13:04	J84702-4	2533	113260	38384	5165

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INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:10	J84702-5	2656	117750	40163	5260
13:16	J84702-6	2462	110820	37939	5057
13:23	ZZZZZZ	2748	117600	40564	5628
13:29	ZZZZZZ	2673	116450	39950	5533
13:35	ZZZZZZ	2678	116960	40118	5527
13:41	ZZZZZZ	2671	117200	39762	5510
13:47	ZZZZZZ	2757	120830	42006	5491
13:53	ZZZZZZ	2631	113600	39171	5660
14:00	MA20598-CCV4	2601	111900	38105	5554
14:06	MA20598-CCB7	2706	115070	39015	5835
14:12	ZZZZZZ	2553	112140	38241	5286
14:18	ZZZZZZ	2662	114650	39779	5656
14:24	ZZZZZZ	2641	113550	38753	5565
14:31	ZZZZZZ	2722	118040	40129	5350
14:37	ZZZZZZ	2624	113630	38587	5516
14:43	ZZZZZZ	2600	115230	39240	5432
14:49	ZZZZZZ	2614	113940	38556	5574
14:56	ZZZZZZ	2710	115630	39209	5837
15:02	MP42829-LC1	2672	113780	38815	5748
15:08	MA20598-CCV5	2631	113670	37597	5577
15:14	MA20598-CCB8	2706	109020	38213	5804
15:20	ZZZZZZ	2676	112150	38433	5763
15:27	MP42828-B1	2619	112490	38149	5620
15:33	ZZZZZZ	2661	112770	38380	5708
15:39	MP42828-S1	2592	112950	37671	5554
15:45	MP42828-S2	2582	112340	37543	5529
15:51	J85137-6	2641	113290	38021	5679
15:57	MP42828-SD1	2714	115380	38104	5841
16:03	ZZZZZZ	2563	111590	36842	5459
16:10	ZZZZZZ	2215	106720	33881	4460
16:16	MA20598-CCV6	2677	112360	37542	5624
16:22	MA20598-CCB9	2732	114810	38424	5830
16:28	MA20598-ICSA3	2461	108890	35900	5052

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
16:35	MA20598-ICSAB2	2439	106470	35780	5005
16:42	MA20598-CCV7	2648	112490	37700	5584
16:48	MA20598-CCB10	2736	113960	38113	5824
16:54	ZZZZZZ	2615	113520	37439	5614
17:01	ZZZZZZ	2640	114010	37735	5638
17:07	ZZZZZZ	2642	113670	38070	5580
17:13	ZZZZZZ	2376	104410	36359	4883
17:19	ZZZZZZ	2667	113150	37519	5682
17:25	ZZZZZZ	2717	113430	38015	5801
17:31	ZZZZZZ	2790	112960	38150	5933
17:37	ZZZZZZ	2737	114240	38134	5819
17:44	ZZZZZZ	2741	113730	38090	5819
17:50	ZZZZZZ	2700	113680	37790	5773
17:56	MA20598-CCV8	2745	115390	37898	5714
18:02	MA20598-CCB11	2796	115530	38363	5898
18:12	MA20598-CCV9	2721	115890	37858	5702
18:20	MA20598-CCB12	2800	116270	38512	5941
18:27	ZZZZZZ	2693	113690	37549	5768
18:33	ZZZZZZ	2736	115060	38076	5848
18:39	ZZZZZZ	2698	114020	37896	5774
18:46	ZZZZZZ	2709	114970	38021	5799
18:52	ZZZZZZ	2695	116760	37555	5781
18:58	ZZZZZZ	2738	113810	38105	5837
19:04	MP42831-MB1	2707	113150	37840	5783
19:10	MP42831-LC1	2691	113030	37908	5726
19:16	MP42831-S1	2656	113110	37526	5636
19:22	MP42831-S2	2666	111450	38535	5651
19:29	MA20598-CCV10	2725	114590	37554	5702
19:35	MA20598-CCB13	2764	114930	37901	5870
19:41	MA20598-ICSA4	2461	107030	35914	5036
19:47	MA20598-ICSAB3	2456	107240	34387	5032
19:55	MA20598-CCV11	2669	113520	37276	5621
20:01	MA20598-CCB14	2731	114080	37725	5820

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
20:08	J84877-1F	2701	113900	37445	5804
20:14	MP42831-SD1	2716	113840	37595	5805
20:21	ZZZZZZ	2744	116390	38569	5802
20:27	ZZZZZZ	2734	116910	37497	5787
20:33	ZZZZZZ	2704	113030	37620	5774
20:39	ZZZZZZ	2670	113350	37526	5735
20:45	ZZZZZZ	2714	108320	37484	5790
20:51	MP42818-SD1	2715	114030	37567	5716
20:58	MP42832-MB1	2794	117270	38206	5936
21:04	MA20598-CCV12	2664	112750	36607	5603
21:10	MA20598-CCB15	2747	113360	37550	5849
21:16	MP42832-B1	2698	113920	37638	5705
21:22	MP42832-S1	2613	114150	37430	5303
21:29	MP42832-S2	2612	113450	37374	5306
21:35	J85083-1	2667	114610	37260	5461
21:41	MP42832-SD1	2693	113650	37333	5689
21:47	ZZZZZZ	2699	114550	37957	5578
21:54	ZZZZZZ	2490	110690	35928	5074
22:00	ZZZZZZ	2566	112110	36593	5350
22:06	ZZZZZZ	2514	110960	36110	5185
22:12	ZZZZZZ	2642	114800	37504	5411
22:18	MA20598-CCV13	2674	113220	36932	5619
22:24	MA20598-CCB16	2702	113880	37145	5748
22:31	ZZZZZZ	2650	114370	37463	5457
22:37	ZZZZZZ	2608	113660	37323	5417
22:43	ZZZZZZ	2711	112890	37714	5725
22:49	ZZZZZZ	2657	114330	37489	5516
22:56	ZZZZZZ	2641	113840	37433	5537
23:02	ZZZZZZ	2607	113740	37001	5447
23:08	ZZZZZZ	2676	113370	37288	5665
23:14	ZZZZZZ	2649	115180	37490	5435
23:21	ZZZZZZ	2426	108630	34988	4911
23:27	ZZZZZZ	2252	105640	33364	4540

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
23:33	MA20598-CCV14	2643	111110	36786	5553
23:39	MA20598-CCB17	2746	112330	36520	5829
23:45	ZZZZZZ	2579	113510	36338	5267
23:52	ZZZZZZ	2728	116710	37892	5650
23:58	ZZZZZZ	2790	119660	38804	5556
00:04	ZZZZZZ	2681	115010	37428	5649
00:10	MP42852-MB1	2694	113740	36974	5737
00:17	MP42852-LC1	2690	112620	37283	5702
00:23	MP42852-S1	2652	113590	36719	5646
00:29	MP42852-S2	2669	113660	36524	5658
00:35	J84944-11	2709	114210	36944	5792
00:41	MP42852-SD1	2754	115320	37032	5863
00:47	MA20598-CCV15	2679	113180	36413	5599
00:54	MA20598-CCB18	2766	117620	37305	5864
01:00	ZZZZZZ	2667	114300	37163	5700
01:06	ZZZZZZ	2669	113560	35950	5696
01:12	ZZZZZZ	2679	113340	36440	5702
01:18	ZZZZZZ	2405	103700	35041	4871
01:24	ZZZZZZ	2699	114660	36537	5728
01:31	ZZZZZZ	2718	113770	36302	5761
01:37	ZZZZZZ	2711	112440	35974	5772
01:43	ZZZZZZ	2698	113570	37066	5725
01:49	ZZZZZZ	2723	114060	36406	5793
01:55	ZZZZZZ	2711	113890	36277	5772
02:02	MA20598-CCV16	2702	113430	36063	5623
02:08	MA20598-CCB19	2766	115610	37344	5851
02:14	MA20598-ICSA5	2451	108030	34405	4986
02:21	MA20598-ICSAB4	2479	109140	34837	5046
02:27	MA20598-CCV17	2681	113130	35978	5590
02:33	MA20598-CCB20	2740	113560	35670	5801
02:39	ZZZZZZ	2668	112680	35913	5690
02:46	ZZZZZZ	2647	112460	35810	5654
02:52	ZZZZZZ	2672	113740	36153	5685

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
02:58	ZZZZZZ	2655	113270	36083	5670
03:04	ZZZZZZ	2676	110900	35924	5710
03:11	ZZZZZZ	2679	114010	36134	5716
03:17	ZZZZZZ	2674	112510	36156	5719
03:23	ZZZZZZ	2679	112440	35866	5716
03:29	ZZZZZZ	2662	112770	35755	5698
03:35	ZZZZZZ	2690	114260	36277	5735
03:42	MA20598-CCV18	2677	113920	36347	5598
03:48	MA20598-CCB21	2729	114940	36248	5787
03:54	MP42851-MB1	2721	112070	36379	5774
04:00	MP42851-LC1	2688	114300	36060	5692
04:06	MP42851-S1	2648	113350	35388	5600
04:12	MP42851-S2	2632	112890	35546	5557
04:19	J84944-1	2684	113680	36023	5725
04:25	MP42851-SD1	2744	113910	36311	5855
04:31	ZZZZZZ	2618	112800	35317	5581
04:37	ZZZZZZ	2655	114970	34586	5651
04:44	ZZZZZZ	2704	113670	36036	5771
04:50	ZZZZZZ	2694	114200	36095	5705
04:56	MA20598-CCV19	2648	113110	35376	5526
05:02	MA20598-CCB22	2730	113760	35873	5773
05:08	ZZZZZZ	2652	112260	35971	5636
05:15	ZZZZZZ	2727	114040	35940	5784
05:21	ZZZZZZ	2640	113160	35397	5626
05:27	ZZZZZZ	2656	113790	34695	5612
05:33	ZZZZZZ	2683	113990	36058	5703
05:40	ZZZZZZ	2649	112690	35187	5647
05:46	ZZZZZZ	2581	109760	34742	5523
05:52	ZZZZZZ	2651	111750	35426	5683
05:58	ZZZZZZ	2653	112220	35764	5710
06:04	ZZZZZZ	2649	113300	35789	5658
06:11	MA20598-CCV20	2614	115460	34508	5491
06:17	MA20598-CCB23	2719	112840	35952	5805

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20598
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
06:23	ZZZZZZ	2697	113360	35770	5743
06:30	ZZZZZZ	2616	111850	35429	5633
06:36	ZZZZZZ	2626	112300	35259	5650
06:42	ZZZZZZ	2595	112250	35584	5593
06:48	ZZZZZZ	2617	113810	35553	5604
06:54	ZZZZZZ	2670	113680	34989	5719
07:01	MA20598-CCV21	2630	112870	35241	5519
07:07	MA20598-CCB24	2673	113480	35523	5694
07:29	MA20598-ICSA6	2422	106690	32600	4960
07:36	MA20598-ICSA7	2418	112340	32595	4952
07:43	MA20598-ICSAB5	2406	105870	34645	4923
07:51	MA20598-CCV22	2632	112240	34785	5502
07:58	MA20598-CCB25	2693	114450	35557	5712

R = Reference for ISTD limits. ! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	60-125 %
Istd#2	Yttrium (3600)	60-125 %
Istd#3	Yttrium (3710)	60-125 %
Istd#4	Indium	60-125 %

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA20598 Units: ug/l

Time:			10:00		10:07		10:45		11:01	
Sample ID:			CCB2		CCB3		ICB1		CCB4	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	28	anr							
Antimony	6.0	1.4	anr							
Arsenic	3.0	1.2	0.20	<3.0	0.20	<3.0	0.10	<3.0	0.50	<3.0
Barium	200	1	0.0	<200	0.10	<200	0.10	<200	0.20	<200
Beryllium	1.0	.1	anr							
Boron	100	1.5	anr							
Cadmium	4.0	.4	0.10	<4.0	0.0	<4.0	0.0	<4.0	-0.10	<4.0
Calcium	5000	31	anr							
Chromium	10	.3	0.0	<10	-0.10	<10	-0.30	<10	-0.30	<10
Cobalt	50	.3	anr							
Copper	25	3	anr							
Iron	100	9	anr							
Lead	3.0	1.2	-1.1	<3.0	-0.30	<3.0	0.0	<3.0	0.0	<3.0
Magnesium	5000	28	anr							
Manganese	15	.1	anr							
Molybdenum	20	.4	anr							
Nickel	40	.3	anr							
Palladium	50	3								
Potassium	10000	50	anr							
Selenium	10	1.1	-1.0	<10	-0.70	<10	-1.0	<10	-0.50	<10
Silicon	200	3.6								
Silver	10	.6	-0.10	<10	-0.20	<10	0.0	<10	-0.10	<10
Sodium	10000	9	anr							
Strontium	10	.1								
Thallium	2.0	.8	anr							
Tin	10	.8	anr							
Titanium	10	.3								
Vanadium	50	.4	anr							
Zinc	20	2	anr							

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP
QC Limits: result < RL

Date Analyzed: 03/11/08
Run ID: MA20598

Methods: EPA 200.7, SW846 6010B
Units: ug/l

Time: Sample ID:			11:37 CCB5		12:52 CCB6		14:06 CCB7		15:14 CCB8	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	28	anr							
Antimony	6.0	1.4	anr							
Arsenic	3.0	1.2	0.80	<3.0	1.4	<3.0	1.3	<3.0	1.4	<3.0
Barium	200	1	0.10	<200	0.20	<200	0.30	<200	0.30	<200
Beryllium	1.0	.1	anr							
Boron	100	1.5	anr							
Cadmium	4.0	.4	0.0	<4.0	0.10	<4.0	0.10	<4.0	0.10	<4.0
Calcium	5000	31	anr							
Chromium	10	.3	-0.20	<10	-0.20	<10	-0.20	<10	-0.30	<10
Cobalt	50	.3	anr							
Copper	25	3	anr							
Iron	100	9	anr							
Lead	3.0	1.2	-1.5	<3.0	0.0	<3.0	0.20	<3.0	-0.30	<3.0
Magnesium	5000	28	anr							
Manganese	15	.1	anr							
Molybdenum	20	.4	anr							
Nickel	40	.3	anr							
Palladium	50	3								
Potassium	10000	50	anr							
Selenium	10	1.1	-0.60	<10	-0.20	<10	-0.50	<10	-0.70	<10
Silicon	200	3.6								
Silver	10	.6	0.0	<10	-0.20	<10	-0.10	<10	0.10	<10
Sodium	10000	9	anr							
Strontium	10	.1								
Thallium	2.0	.8	anr							
Tin	10	.8	anr							
Titanium	10	.3								
Vanadium	50	.4	anr							
Zinc	20	2	anr							

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA20598 Units: ug/l

Time:			16:22		16:48		18:02		18:20	
Sample ID:			CCB9		CCB10		CCB11		CCB12	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	28	anr							
Antimony	6.0	1.4	anr							
Arsenic	3.0	1.2	0.50	<3.0	1.1	<3.0	1.4	<3.0	0.10	<3.0
Barium	200	1	0.30	<200	0.40	<200	0.20	<200	0.30	<200
Beryllium	1.0	.1	anr							
Boron	100	1.5	anr							
Cadmium	4.0	.4	0.10	<4.0	0.0	<4.0	0.0	<4.0	0.0	<4.0
Calcium	5000	31	anr							
Chromium	10	.3	-0.10	<10	-0.30	<10	-0.40	<10	0.10	<10
Cobalt	50	.3	anr							
Copper	25	3	anr							
Iron	100	9	anr							
Lead	3.0	1.2	-0.10	<3.0	-0.60	<3.0	-0.80	<3.0	0.20	<3.0
Magnesium	5000	28	anr							
Manganese	15	.1	anr							
Molybdenum	20	.4	anr							
Nickel	40	.3	anr							
Palladium	50	3								
Potassium	10000	50	anr							
Selenium	10	1.1	-1.3	<10	-1.1	<10	-1.3	<10	-2.4	<10
Silicon	200	3.6								
Silver	10	.6	-0.40	<10	-0.40	<10	-0.20	<10	-0.20	<10
Sodium	10000	9	anr							
Strontium	10	.1								
Thallium	2.0	.8	anr							
Tin	10	.8	anr							
Titanium	10	.3								
Vanadium	50	.4	anr							
Zinc	20	2	anr							

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA20598 Units: ug/l

Time:			19:35		20:01		21:10		22:24	
Sample ID:			CCB13		CCB14		CCB15		CCB16	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	28	anr							
Antimony	6.0	1.4	anr							
Arsenic	3.0	1.2	0.80	<3.0	1.2	<3.0	0.60	<3.0	0.20	<3.0
Barium	200	1	0.40	<200	0.20	<200	0.40	<200	0.40	<200
Beryllium	1.0	.1	anr							
Boron	100	1.5	anr							
Cadmium	4.0	.4	0.0	<4.0	0.0	<4.0	0.10	<4.0	0.10	<4.0
Calcium	5000	31	anr							
Chromium	10	.3	-0.20	<10	-0.20	<10	-0.10	<10	0.20	<10
Cobalt	50	.3	anr							
Copper	25	3	anr							
Iron	100	9	anr							
Lead	3.0	1.2	-0.60	<3.0	0.10	<3.0	-0.60	<3.0	-0.80	<3.0
Magnesium	5000	28	anr							
Manganese	15	.1	anr							
Molybdenum	20	.4	anr							
Nickel	40	.3	anr							
Palladium	50	3								
Potassium	10000	50	anr							
Selenium	10	1.1	-0.90	<10	-1.7	<10	-1.5	<10	-2.3	<10
Silicon	200	3.6								
Silver	10	.6	0.0	<10	-0.50	<10	0.0	<10	-0.10	<10
Sodium	10000	9	anr							
Strontium	10	.1								
Thallium	2.0	.8	anr							
Tin	10	.8	anr							
Titanium	10	.3								
Vanadium	50	.4	anr							
Zinc	20	2	anr							

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA20598 Units: ug/l

Time:			23:39		00:54		02:08		02:33	
Sample ID:			CCB17		CCB18		CCB19		CCB20	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	28	anr							
Antimony	6.0	1.4	anr							
Arsenic	3.0	1.2	0.40	<3.0	1.1	<3.0	0.10	<3.0	0.0	<3.0
Barium	200	1	0.50	<200	0.50	<200	0.50	<200	0.50	<200
Beryllium	1.0	.1	anr							
Boron	100	1.5	anr							
Cadmium	4.0	.4	-0.10	<4.0	0.0	<4.0	-0.10	<4.0	0.10	<4.0
Calcium	5000	31	anr							
Chromium	10	.3	0.10	<10	-0.20	<10	-0.10	<10	-0.20	<10
Cobalt	50	.3	anr							
Copper	25	3	anr							
Iron	100	9	anr							
Lead	3.0	1.2	-0.30	<3.0	-0.50	<3.0	-0.20	<3.0	-0.10	<3.0
Magnesium	5000	28	anr							
Manganese	15	.1	anr							
Molybdenum	20	.4	anr							
Nickel	40	.3	anr							
Palladium	50	3								
Potassium	10000	50	anr							
Selenium	10	1.1	-1.7	<10	-2.5	<10	-1.6	<10	-2.3	<10
Silicon	200	3.6								
Silver	10	.6	-0.40	<10	-0.30	<10	-0.30	<10	-0.30	<10
Sodium	10000	9	anr							
Strontium	10	.1								
Thallium	2.0	.8	anr							
Tin	10	.8	anr							
Titanium	10	.3								
Vanadium	50	.4	anr							
Zinc	20	2	anr							

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20598 Units: ug/l

Time:		10:51	
Sample ID:	ICCV	ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	1990	99.5
Barium	2000	2010	100.5
Beryllium	anr		
Boron	anr		
Cadmium	2000	1990	99.5
Calcium	anr		
Chromium	2000	2000	100.0
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	2000	2000	100.0
Magnesium	anr		
Manganese	anr		
Molybdenum	anr		
Nickel	anr		
Palladium			
Potassium	anr		
Selenium	2000	1990	99.5
Silicon			
Silver	250	246	98.4
Sodium	anr		
Strontium			
Thallium	anr		
Tin	anr		
Titanium			
Vanadium	anr		
Zinc	anr		

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 03/11/08
Run ID: MA20598

Methods: EPA 200.7, SW846 6010B
Units: ug/l

Time: Sample ID: Metal	ICV True	10:34 ICV1 Results	% Rec	CCV True	11:31 CCV2 Results	% Rec	CCV True	12:45 CCV3 Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	1000	978	97.8	2000	2000	100.0	2000	1980	99.0
Barium	1000	1020	102.0	2000	2060	103.0	2000	2030	101.5
Beryllium	anr								
Boron	anr								
Cadmium	1000	987	98.7	2000	2000	100.0	2000	1990	99.5
Calcium	anr								
Chromium	1000	1010	101.0	2000	1990	99.5	2000	2040	102.0
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	1000	1000	100.0	2000	2010	100.5	2000	2010	100.5
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	1000	973	97.3	2000	1990	99.5	2000	1980	99.0
Silicon									
Silver	500	479	95.8	250	243	97.2	250	251	100.4
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20598 Units: ug/l

Time: / Sample ID: / Metal	CCV True	14:00 CCV4 Results	% Rec	CCV True	15:08 CCV5 Results	% Rec	CCV True	16:16 CCV6 Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1990	99.5	2000	1980	99.0	2000	1970	98.5
Barium	2000	2080	104.0	2000	2090	104.5	2000	2080	104.0
Beryllium	anr								
Boron	anr								
Cadmium	2000	1990	99.5	2000	1980	99.0	2000	1970	98.5
Calcium	anr								
Chromium	2000	2030	101.5	2000	2000	100.0	2000	2060	103.0
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	2040	102.0	2000	2040	102.0	2000	2050	102.5
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	2000	1990	99.5	2000	1980	99.0	2000	1970	98.5
Silicon									
Silver	250	248	99.2	250	245	98.0	250	252	100.8
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20598 Units: ug/l

Time: Sample ID: Metal	CCV True	16:42 CCV7 Results	% Rec	CCV True	17:56 CCV8 Results	% Rec	CCV True	18:12 CCV9 Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1980	99.0	2000	1950	97.5	2000	1930	96.5
Barium	2000	2070	103.5	2000	2050	102.5	2000	2040	102.0
Beryllium	anr								
Boron	anr								
Cadmium	2000	1980	99.0	2000	1960	98.0	2000	1940	97.0
Calcium	anr								
Chromium	2000	2030	101.5	2000	2030	101.5	2000	1980	99.0
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	2050	102.5	2000	2040	102.0	2000	2010	100.5
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	2000	1980	99.0	2000	1960	98.0	2000	1940	97.0
Silicon									
Silver	250	250	100.0	250	247	98.8	250	241	96.4
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20598 Units: ug/l

Time: Sample ID: Metal	CCV True	19:29 CCV10 Results	% Rec	CCV True	19:55 CCV11 Results	% Rec	CCV True	21:04 CCV12 Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1930	96.5	2000	1960	98.0	2000	1950	97.5
Barium	2000	2080	104.0	2000	2080	104.0	2000	2120	106.0
Beryllium	anr								
Boron	anr								
Cadmium	2000	1940	97.0	2000	1960	98.0	2000	1960	98.0
Calcium	anr								
Chromium	2000	2030	101.5	2000	2020	101.0	2000	2030	101.5
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	2020	101.0	2000	2040	102.0	2000	2040	102.0
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	2000	1940	97.0	2000	1960	98.0	2000	1960	98.0
Silicon									
Silver	250	247	98.8	250	247	98.8	250	248	99.2
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20598 Units: ug/l

Time: / Sample ID: / Metal	CCV True	22:18 CCV13 Results	% Rec	CCV True	23:33 CCV14 Results	% Rec	CCV True	00:47 CCV15 Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	1940	97.0	2000	1960	98.0	2000	1940	97.0
Barium	2000	2090	104.5	2000	2100	105.0	2000	2100	105.0
Beryllium	anr								
Boron	anr								
Cadmium	2000	1940	97.0	2000	1960	98.0	2000	1940	97.0
Calcium	anr								
Chromium	2000	2020	101.0	2000	2070	103.5	2000	2050	102.5
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	2030	101.5	2000	2070	103.5	2000	2060	103.0
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	2000	1950	97.5	2000	1970	98.5	2000	1950	97.5
Silicon									
Silver	250	248	99.2	250	254	101.6	250	251	100.4
Sodium	anr								
Strontium									
Thallium	anr								
Tin	anr								
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20598 Units: ug/l

Time: / Sample ID: / Metal	CCV True	02:02 CCV16 Results	% Rec	CCV True	02:27 CCV17 Results	% Rec
Aluminum	anr					
Antimony	anr					
Arsenic	2000	1940	97.0	2000	1940	97.0
Barium	2000	2130	106.5	2000	2110	105.5
Beryllium	anr					
Boron	anr					
Cadmium	2000	1940	97.0	2000	1940	97.0
Calcium	anr					
Chromium	2000	2060	103.0	2000	2040	102.0
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	2000	2060	103.0	2000	2060	103.0
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Palladium						
Potassium	anr					
Selenium	2000	1950	97.5	2000	1940	97.0
Silicon						
Silver	250	250	100.0	250	249	99.6
Sodium	anr					
Strontium						
Thallium	anr					
Tin	anr					
Titanium						
Vanadium	anr					
Zinc	anr					

(*) Outside of QC limits
(anr) Analyte not requested

HIGH STANDARD CHECK SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20598 Units: ug/l

Time:		10:14	
Sample ID:	HSTD	HSTD1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	4000	3950	98.8
Barium	4000	3930	98.3
Beryllium	anr		
Boron	anr		
Cadmium	4000	3950	98.8
Calcium	anr		
Chromium	4000	4050	101.3
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	4000	3950	98.8
Magnesium	anr		
Manganese	anr		
Molybdenum	anr		
Nickel	anr		
Palladium			
Potassium	anr		
Selenium	4000	3950	98.8
Silicon			
Silver	500	509	101.8
Sodium	anr		
Strontium			
Thallium	anr		
Tin	anr		
Titanium			
Vanadium	anr		
Zinc	anr		

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 50 to 150 % Recovery Run ID: MA20598 Units: ug/l

Time:			10:27	
Sample ID:	CRI	CRIA	CRIA1	
Metal	True	True	Results	% Rec
Aluminum				
Antimony	120	10		
Arsenic	20	6.0		
Barium	400			
Beryllium	10	2.0	anr	
Boron				
Cadmium	10			
Calcium				
Chromium	20			
Cobalt	100			
Copper	50			
Iron				
Lead	6.0	6.0		
Magnesium				
Manganese	30			
Molybdenum	40			
Nickel	80			
Palladium	100			
Potassium				
Selenium	10	10		
Silicon				
Silver	20			
Sodium				
Strontium				
Thallium	20	4.0		
Tin				
Titanium				
Vanadium	100			
Zinc	40			

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP
QC Limits: 50 to 150 % Recovery

Date Analyzed: 03/11/08
Run ID: MA20598

Methods: EPA 200.7, SW846 6010B
Units: ug/l

Time:		10:21	
Sample ID:	CRIB	CRIB1	
Metal	True	Results	% Rec
Aluminum	400		
Antimony	12		
Arsenic	16	20.2	126.3
Barium	400	424	106.0
Beryllium	2.0		
Boron	200		
Cadmium	8.0	9.0	112.5
Calcium	5000		
Chromium	20	22.1	110.5
Cobalt	100		
Copper	50		
Iron	200		
Lead	6.0	6.2	103.3
Magnesium	5000		
Manganese	30		
Molybdenum	40		
Nickel	80		
Palladium	100		
Potassium	10000		
Selenium	20	19.8	99.0
Silicon	400		
Silver	20	20.5	102.5
Sodium	10000		
Strontium	20		
Thallium	20		
Tin	20		
Titanium	20		
Vanadium	100		
Zinc	40		

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 80 to 120 % Recovery Run ID: MA20598 Units: ug/l

Time: Sample ID: Metal	ICSA True	ICSAB True	11:09 ICSA1 Results	% Rec	11:17 ICSA2 Results	% Rec	11:24 ICSAB1 Results	% Rec	16:28 ICSA3 Results	% Rec
Aluminum	500000	500000			516000	103.2	499000	99.8	512000	102.4
Antimony		1000			-0.50		1050	105.0	-1.7	
Arsenic		1000			2.9		994	99.4	3.6	
Barium		500			2.2		519	103.8	2.5	
Beryllium		500			0.0		508	101.6	0.0	
Boron					-3.7		-8.2		-2.9	
Cadmium		1000			2.3		1070	107.0	2.1	
Calcium	400000	400000			383000	95.8	380000	95.0	394000	98.5
Chromium		500			0.20		493	98.6	0.60	
Cobalt		500			5.3		504	100.8	4.8	
Copper		500			3.2		506	101.2	0.80	
Iron	200000	200000			192000	96.0	185000	92.5	193000	96.5
Lead		1000			3.8		981	98.1	4.0	
Magnesium	500000	500000			535000	107.0	524000	104.8	542000	108.4
Manganese		500			0.20		503	100.6	0.30	
Molybdenum		500			-2.0		497	99.4	-2.0	
Nickel		1000			-3.3		967	96.7	-3.4	
Palladium		500			0.30		538	107.6	-0.30	
Potassium					-26		-26		-8.8	
Selenium		1000			-0.10		1000	100.0	-0.90	
Silicon					-29		-3.0		-25	
Silver		1000			0.30		1050	105.0	-0.10	
Sodium					18.9		18.1		103	
Strontium					0.60		0.50		0.20	
Thallium		1000			-0.30		995	99.5	-1.8	
Tin					0.70		0.70		0.20	
Titanium					2.0		2.4		2.1	
Vanadium		500			1.5		496	99.2	2.5	
Zinc		1000			2.7		976	97.6	2.4	

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 80 to 120 % Recovery Run ID: MA20598 Units: ug/l

Time:			16:35		19:41		19:47		02:14	
Sample ID:	ICSA	ICSAB	ICSAB2		ICSA4		ICSAB3		ICSA5	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	503000	100.6	502000	100.4	499000	99.8	507000	101.4
Antimony		1000	1050	105.0	-1.6		1020	102.0	-1.3	
Arsenic		1000	983	98.3	2.5		952	95.2	0.90	
Barium		500	533	106.6	2.4		542	108.4	2.6	
Beryllium		500	516	103.2	0.0		520	104.0	0.0	
Boron			-6.6		-3.8		-7.8		-3.8	
Cadmium		1000	1050	105.0	2.2		1020	102.0	2.1	
Calcium	400000	400000	398000	99.5	383000	95.8	393000	98.3	391000	97.8
Chromium		500	507	101.4	0.60		491	98.2	0.40	
Cobalt		500	519	103.8	5.7		506	101.2	5.8	
Copper		500	511	102.2	2.5		515	103.0	4.3	
Iron	200000	200000	188000	94.0	189000	94.5	188000	94.0	191000	95.5
Lead		1000	1000	100.0	5.9		972	97.2	4.9	
Magnesium	500000	500000	544000	108.8	523000	104.6	541000	108.2	531000	106.2
Manganese		500	514	102.8	0.30		496	99.2	0.30	
Molybdenum		500	491	98.2	-2.0		478	95.6	-1.7	
Nickel		1000	963	96.3	-3.0		936	93.6	-3.3	
Palladium		500	541	108.2	-0.90		523	104.6	0.30	
Potassium			-14		-13		-9.2		-27	
Selenium		1000	990	99.0	0.30		964	96.4	-0.80	
Silicon			-1.5		-29		-5.2		-30	
Silver		1000	1080	108.0	0.10		1040	104.0	0.10	
Sodium			64.7		20.3		11.2		14.5	
Strontium			0.20		0.40		0.60		0.40	
Thallium		1000	1030	103.0	0.20		1010	101.0	-3.6	
Tin			-0.10		0.80		0.80		0.30	
Titanium			2.4		2.1		2.2		1.9	
Vanadium		500	503	100.6	2.6		484	96.8	3.5	
Zinc		1000	1020	102.0	2.6		984	98.4	1.9	

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031108M1.ICP Date Analyzed: 03/11/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 80 to 120 % Recovery Run ID: MA20598 Units: ug/l

Time:			02:21	
Sample ID:	ICSA	ICSAB	ICSAB4	
Metal	True	True	Results	% Rec
Aluminum	500000	500000	484000	96.8
Antimony		1000	1010	101.0
Arsenic		1000	939	93.9
Barium		500	524	104.8
Beryllium		500	494	98.8
Boron			-7.7	
Cadmium		1000	1010	101.0
Calcium	400000	400000	384000	96.0
Chromium		500	484	96.8
Cobalt		500	511	102.2
Copper		500	485	97.0
Iron	200000	200000	182000	91.0
Lead		1000	977	97.7
Magnesium	500000	500000	517000	103.4
Manganese		500	485	97.0
Molybdenum		500	473	94.6
Nickel		1000	926	92.6
Palladium		500	513	102.6
Potassium			-35	
Selenium		1000	949	94.9
Silicon			-4.6	
Silver		1000	1030	103.0
Sodium			12.7	
Strontium			0.30	
Thallium		1000	1020	102.0
Tin			0.60	
Titanium			2.3	
Vanadium		500	471	94.2
Zinc		1000	992	99.2

(*) Outside of QC limits
(anr) Analyte not requested

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10313S1.PRN Date Analyzed: 03/13/08 Methods: SW846 7471A
Analyst: JF Run ID: MA20605
Parameters: Hg

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	11:13	MA20605-STD1	1		R=0.99981, B=9.28494e-5, C=-1.071e-1.
	11:14	MA20605-STD2	1		STD02REP1
	11:15	MA20605-STD3	1		STD03REP1
	11:16	MA20605-STD4	1		STD04REP1
	11:18	MA20605-STD5	1		STD05REP1
	11:19	MA20605-STD6	1		STD06REP1
	11:22	MA20605-ICV1	1		
	11:24	MA20605-ICV2	1		
	11:25	MA20605-ICB1	1		
	11:26	MA20605-CCV1	1		
	11:27	MA20605-CCB1	1		
	11:29	MA20605-CRI1	1		
	11:30	MP42872-MB1	1		
	11:31	MP42872-LC1	1		
	11:33	MP42872-S1	1		
	11:34	MP42872-S2	1		
	11:35	J84702-7	1		
---------->	Last reportable sample/prep for job J84702				
	11:36	ZZZZZZ	1		
	11:38	ZZZZZZ	1		
	11:39	ZZZZZZ	1		
	11:41	ZZZZZZ	1		
	11:42	MA20605-CCV2	1		
	11:43	MA20605-CCB2	1		
---------->	Last reportable CCB for job J84702				
	11:44	ZZZZZZ	1		
	11:45	ZZZZZZ	1		
	11:46	ZZZZZZ	1		
	11:48	ZZZZZZ	1		
	11:49	ZZZZZZ	1		
	11:50	ZZZZZZ	1		
	11:51	ZZZZZZ	1		
	11:52	ZZZZZZ	1		
	11:54	ZZZZZZ	1		
	11:55	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10313S1.PRN Date Analyzed: 03/13/08 Methods: SW846 7471A
Analyst: JF Run ID: MA20605
Parameters: Hg

Time	Sample Description	Dilution Factor	PS Recov	Comments
11:57	MA20605-CCV3	1		
11:58	MA20605-CCB3	1		
11:59	ZZZZZZ	1		
12:01	ZZZZZZ	1		
12:02	ZZZZZZ	1		
12:03	ZZZZZZ	1		
12:04	ZZZZZZ	1		
12:05	MA20605-CCV4	1		
12:06	MA20605-CCB4	1		

Refer to raw data for calibration curve and standards.

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10313S1.PRN Date Analyzed: 03/13/08 Methods: SW846 7471A
QC Limits: result < RL Run ID: MA20605 Units: ug/l

Time:			11:25		11:27		11:43	
Sample ID:			ICB1		CCB1		CCB2	
Metal	RL	IDL	raw	final	raw	final	raw	final
Mercury	0.20	.091	-0.015	<0.20	-0.051	<0.20	-0.046	<0.20

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10313S1.PRN Date Analyzed: 03/13/08 Methods: SW846 7471A
QC Limits: 90 to 110 % Recovery Run ID: MA20605 Units: ug/l

Time:		11:22			11:24			11:26	
Sample ID:	ICV	ICV1		ICV	ICV2		CCV	CCV1	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Mercury	3	3.3	110.0	3	3.2	106.7	2.5	2.5	100.0

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10313S1.PRN Date Analyzed: 03/13/08 Methods: SW846 7471A
QC Limits: 90 to 110 % Recovery Run ID: MA20605 Units: ug/l

Time:		11:42	
Sample ID:	CCV	CCV2	
Metal	True	Results	% Rec
Mercury	2.5	2.5	100.0

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: H10313S1.PRN Date Analyzed: 03/13/08 Methods: SW846 7471A
QC Limits: 50 to 150 % Recovery Run ID: MA20605 Units: ug/l

Time:			11:29	
Sample ID:	CRI	CRIA	CRI1	
Metal	True	True	Results	% Rec
Mercury	0.20		0.18	90.0

(*) Outside of QC limits
(anr) Analyte not requested

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
17:01	MA20616-STD1	1		STDA
17:08	MA20616-STD2	1		STDB
17:14	MA20616-CCV1	1		
17:22	MA20616-CCB1	1		
17:31	MA20616-HSTD1	1		
17:38	MA20616-CRIB1	1		
17:45	MA20616-CRIA1	1		
17:53	MA20616-ICV1	1		
18:02	MA20616-ICB1	1		
18:08	MA20616-ICCV1	1		
18:20	MA20616-CCB2	1		
18:30	MA20616-ICSA1	1		
18:36	MA20616-ICSAB1	1		
18:43	MA20616-CCV2	1		
18:49	MA20616-CCB3	1		
18:56	MP42875-MB1	1		
19:02	MP42875-LC1	1		
19:08	MP42875-S1	1		
19:14	MP42875-S2	1		
19:20	J84520-2	1		(sample used for QC only; not part of login J84702)
19:27	MP42875-SD1	5		
19:33	ZZZZZZ	1		
19:39	ZZZZZZ	1		
19:45	ZZZZZZ	1		
19:52	MA20616-CCV3	1		
19:58	MA20616-CCB4	1		
20:04	ZZZZZZ	1		
20:10	ZZZZZZ	1		
20:16	MP42888-MB1	1		
20:23	MP42888-B1	1		
20:29	MP42888-LC1	1		
20:35	MP42888-S1	1		Ca=687ppm
20:41	MP42888-S2	1		Rerun straight with S1

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	20:48	J84702-7	1		
	20:54	MP42888-SD1	5		
	21:00	MA20616-CCV4	1		
	21:06	MA20616-CCB5	1		
	21:12	MP42888-LC1	1		
---------->	Last reportable sample/prep for job J84702				
	21:18	ZZZZZZ	1		
	21:25	ZZZZZZ	1		
	21:31	ZZZZZZ	1		
	21:37	ZZZZZZ	1		
	21:43	ZZZZZZ	1		
	21:50	ZZZZZZ	1		
	21:56	ZZZZZZ	1		
	22:02	ZZZZZZ	1		
	22:08	ZZZZZZ	1		
	22:15	MA20616-CCV5	1		
	22:21	MA20616-CCB6	1		
	22:27	ZZZZZZ	1		
	22:33	ZZZZZZ	1		
	22:39	ZZZZZZ	1		
	22:45	ZZZZZZ	1		
	22:51	ZZZZZZ	1		
	22:58	ZZZZZZ	1		
	23:04	ZZZZZZ	1		
	23:10	ZZZZZZ	1		
	23:16	MA20616-CCV6	1		
	23:22	MA20616-CCB7	1		
	23:28	MP42891-MB1	1		
	23:35	MP42891-B1	1		
	23:41	MP42891-LC1	1		
	23:47	MP42891-S1	1		Analytical problems
	23:53	MP42891-S2	1		Analytical problems
	23:59	J84653-3	1		(sample used for QC only; not part of login J84702)
	00:05	MP42891-SD1	5		Analytical problems

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

	Time	Sample Description	Dilution Factor	PS Recov	Comments
	00:11	ZZZZZZ	1		
	00:17	ZZZZZZ	1		
	00:24	ZZZZZZ	1		
	00:30	MA20616-CCV7	1		
	00:36	MA20616-CCB8	1		
	00:42	MA20616-CRIB2	1		
	00:48	MA20616-CRIA2	1		
	00:55	MA20616-ICSA2	1		
	01:01	MA20616-ICSAB2	1		
	01:07	MA20616-CCV8	1		
	01:13	MA20616-CCB9	1		
---------->	Last reportable CCB for job J84702				
	01:20	ZZZZZZ	1		
	01:26	ZZZZZZ	1		
	01:32	ZZZZZZ	1		
	01:38	ZZZZZZ	1		
	01:44	ZZZZZZ	1		
	01:51	ZZZZZZ	1		
	01:57	ZZZZZZ	1		
	02:03	ZZZZZZ	1		
	02:10	ZZZZZZ	1		
	02:16	ZZZZZZ	1		
	02:22	MA20616-CCV9	1		
	02:28	MA20616-CCB10	1		
	02:34	ZZZZZZ	1		
	02:41	ZZZZZZ	1		
	02:47	ZZZZZZ	1		
	02:53	ZZZZZZ	1		
	02:59	ZZZZZZ	1		
	03:06	ZZZZZZ	1		
	03:12	MP42889-MB1	1		batch to reprep for ODD elements
	03:18	MP42889-B1	1		
	03:24	MP42889-LC1	1		
	03:30	MP42889-S1	1		High RSD

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
03:37	MA20616-CCV10	1		
03:43	MA20616-CCB11	1		
03:49	MP42889-S2	1		High RSD
03:55	J85557-1	1		(sample used for QC only; not part of login J84702)
04:01	MP42889-SD1	5		High RSD
04:07	MP42889-S3	1		Needs Ps
04:14	MP42889-S4	1		High RSD
04:20	J85573-1	1		(sample used for QC only; not part of login J84702)
04:26	MP42889-SD2	5		
04:32	ZZZZZZ	1		
04:38	ZZZZZZ	1		
04:45	ZZZZZZ	1		
04:51	MA20616-CCV11	1		
04:57	MA20616-CCB12	1		
05:03	ZZZZZZ	1		
05:10	ZZZZZZ	1		
05:16	ZZZZZZ	1		
05:22	ZZZZZZ	1		
05:28	ZZZZZZ	1		
05:34	ZZZZZZ	1		
05:40	ZZZZZZ	1		
05:47	ZZZZZZ	1		
05:53	ZZZZZZ	1		
05:59	ZZZZZZ	1		
06:05	MA20616-CCV12	1		
06:11	MA20616-CCB13	1		
06:18	ZZZZZZ	1		
06:24	ZZZZZZ	1		
06:30	ZZZZZZ	1		
06:36	ZZZZZZ	1		
06:42	ZZZZZZ	1		
06:48	MP42895-MB1	1		
06:55	MP42895-LC1	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
07:01	MP42895-S1	1		
07:07	MP42895-S2	1		
07:13	J84786-2	1		(sample used for QC only; not part of login J84702)
07:19	MA20616-CCV13	1		
07:25	MA20616-CCB14	1		
07:31	MA20616-CRIB3	1		
07:37	MA20616-CRIA3	1		
07:44	MA20616-ICSA3	1		
07:50	MA20616-ICSAB3	1		
07:56	MA20616-CCV14	1		
08:03	MA20616-CCB15	1		
08:09	MP42895-SD1	5		
08:15	ZZZZZZ	1		
08:21	ZZZZZZ	1		
08:27	ZZZZZZ	1		
08:34	ZZZZZZ	1		
08:40	ZZZZZZ	1		
08:46	ZZZZZZ	1		
08:53	ZZZZZZ	1		
08:59	ZZZZZZ	1		
09:05	ZZZZZZ	1		
09:11	MA20616-CCV15	1		
09:17	MA20616-CCB16	1		
09:24	ZZZZZZ	1		
09:30	ZZZZZZ	1		
09:36	ZZZZZZ	1		
09:42	ZZZZZZ	1		
09:49	ZZZZZZ	1		
09:55	ZZZZZZ	1		
10:01	ZZZZZZ	1		
10:07	ZZZZZZ	1		
10:14	ZZZZZZ	1		
10:20	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
10:26	MA20616-CCV16	1		
10:32	MA20616-CCB17	1		
10:39	ZZZZZZ	1		
10:45	ZZZZZZ	1		
10:51	ZZZZZZ	2		
10:57	ZZZZZZ	1		
11:04	ZZZZZZ	1		
11:10	MP42893-MB1	1		CCB out
11:16	MP42893-LC1	1		CCB out
11:22	MP42893-S1	1		Na overrange. CCB out
11:29	MP42893-S2	1		Na overrange. CCB out
11:35	J85226-1	1		(sample used for QC only; not part of login J84702)
11:42	MA20616-CCV17	1		
11:48	MA20616-CCB18	1		
11:54	MP42893-SD1	5		CCB out
12:01	ZZZZZZ	1		
12:07	ZZZZZZ	1		
12:13	ZZZZZZ	1		
12:20	ZZZZZZ	1		
12:26	ZZZZZZ	1		
12:32	ZZZZZZ	1		
12:39	ZZZZZZ	1		
12:45	ZZZZZZ	1		
12:51	ZZZZZZ	1		
12:58	MA20616-CCV18	1		
13:04	MA20616-CCB19	1		
13:10	ZZZZZZ	1		
13:16	ZZZZZZ	1		
13:23	ZZZZZZ	1		
13:29	ZZZZZZ	1		
13:35	ZZZZZZ	1		
13:41	ZZZZZZ	1		
13:48	ZZZZZZ	1		

Accutest Laboratories Instrument Runlog
Inorganics Analyses

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Dilution Factor	PS Recov	Comments
13:54	ZZZZZZ	1		
14:01	ZZZZZZ	1		
14:07	ZZZZZZ	1		
14:13	MA20616-CCV19	1		
14:19	MA20616-CCB20	1		
14:25	MA20616-ICSA4	1		
14:32	MA20616-ICSAB4	1		
14:38	MA20616-CCV20	1		
14:44	MA20616-CCB21	1		

Refer to raw data for calibration curve and standards.

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
17:01	MA20616-STD1	2665 R	106990 R	27192 R	5638 R
17:08	MA20616-STD2	2547	108760	27356	5255
17:14	MA20616-CCV1	2618	110350	27781	5445
17:22	MA20616-CCB1	2688	110490	28190	5663
17:31	MA20616-HSTD1	2543	109290	27634	5252
17:38	MA20616-CRIB1	2649	110950	27928	5606
17:45	MA20616-CRIA1	2651	111580	27883	5636
17:53	MA20616-ICV1	2614	111720	28121	5532
18:02	MA20616-ICB1	2637	109320	28095	5606
18:08	MA20616-ICCV1	2574	109070	27533	5397
18:20	MA20616-CCB2	2627	111380	28817	5581
18:30	MA20616-ICSA1	2350	103890	26177	4795
18:36	MA20616-ICSAB1	2351	105240	26372	4809
18:43	MA20616-CCV2	2563	109510	27546	5375
18:49	MA20616-CCB3	2640	109840	28017	5608
18:56	MP42875-MB1	2632	110640	28164	5567
19:02	MP42875-LC1	2595	109220	27869	5489
19:08	MP42875-S1	2524	108650	27329	5332
19:14	MP42875-S2	2518	108780	27560	5313
19:20	J84520-2	2551	108780	27578	5424
19:27	MP42875-SD1	2644	110370	27990	5616
19:33	ZZZZZZ	2600	109520	27627	5534
19:39	ZZZZZZ	2506	109070	26871	5299
19:45	ZZZZZZ	2543	109210	27404	5405
19:52	MA20616-CCV3	2609	110500	27725	5435
19:58	MA20616-CCB4	2657	111020	27908	5620
20:04	ZZZZZZ	2555	112670	27895	5400
20:10	ZZZZZZ	2540	111280	27249	5386
20:16	MP42888-MB1	2691	112230	28407	5690
20:23	MP42888-B1	2603	109420	27738	5465
20:29	MP42888-LC1	2690	114800	29090	5450
20:35	MP42888-S1	2536	111830	27742	4874
20:41	MP42888-S2	2582	112310	27907	4997

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
20:48	J84702-7	2634	115400	28444	5094
20:54	MP42888-SD1	2643	111650	27709	5491
21:00	MA20616-CCV4	2579	110080	27416	5388
21:06	MA20616-CCB5	2657	111980	27331	5626
21:12	MP42888-LC1	2699	114290	28646	5460
21:18	ZZZZZZ	2742	116540	29168	5461
21:25	ZZZZZZ	2742	115700	29212	5442
21:31	ZZZZZZ	2752	115500	29115	5469
21:37	ZZZZZZ	2758	117410	29540	5485
21:43	ZZZZZZ	2739	116380	29435	5467
21:50	ZZZZZZ	2771	118000	29524	5430
21:56	ZZZZZZ	2762	116260	29150	5476
22:02	ZZZZZZ	2728	114970	29003	5437
22:08	ZZZZZZ	2720	114980	28755	5516
22:15	MA20616-CCV5	2587	109450	27290	5390
22:21	MA20616-CCB6	2662	109810	27638	5612
22:27	ZZZZZZ	2656	113410	28561	5418
22:33	ZZZZZZ	2688	113320	28432	5498
22:39	ZZZZZZ	2708	115570	28906	5467
22:45	ZZZZZZ	2715	111700	27749	5558
22:51	ZZZZZZ	2830	120870	29858	5463
22:58	ZZZZZZ	2659	112870	28173	5452
23:04	ZZZZZZ	2699	113110	28736	5433
23:10	ZZZZZZ	2722	115430	28910	5464
23:16	MA20616-CCV6	2579	109160	27073	5388
23:22	MA20616-CCB7	2624	109920	27261	5554
23:28	MP42891-MB1	2599	109760	27538	5517
23:35	MP42891-B1	2555	108760	27084	5411
23:41	MP42891-LC1	2578	109230	27290	5454
23:47	MP42891-S1	2559	109080	27282	5400
23:53	MP42891-S2	2547	108490	27588	5377
23:59	J84653-3	2364	101570	26639	4807
00:05	MP42891-SD1	2685	110740	27912	5681

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
00:11	ZZZZZZ	2676	111540	27783	5594
00:17	ZZZZZZ	2635	109890	27503	5574
00:24	ZZZZZZ	2643	109730	27540	5610
00:30	MA20616-CCV7	2617	110240	27320	5442
00:36	MA20616-CCB8	2693	110800	27730	5658
00:42	MA20616-CRIB2	2676	110300	27454	5614
00:48	MA20616-CRIA2	2683	107440	27811	5635
00:55	MA20616-ICSA2	2402	104200	25896	4854
01:01	MA20616-ICSAB2	2411	104470	25941	4875
01:07	MA20616-CCV8	2619	109860	27774	5430
01:13	MA20616-CCB9	2666	109330	27543	5607
01:20	ZZZZZZ	2623	109320	27626	5554
01:26	ZZZZZZ	2673	110090	27599	5616
01:32	ZZZZZZ	2627	110960	26614	5576
01:38	ZZZZZZ	2629	109810	27564	5574
01:44	ZZZZZZ	1217 !	63149 !	17029 !	2157 !
01:51	ZZZZZZ	2488	107890	26053	5098
01:57	ZZZZZZ	2452	108580	25728	5012
02:03	ZZZZZZ	2599	109840	27382	5501
02:10	ZZZZZZ	2666	108960	27250	5604
02:16	ZZZZZZ	2673	111000	27674	5622
02:22	MA20616-CCV9	2621	110440	26975	5433
02:28	MA20616-CCB10	2685	110080	27235	5633
02:34	ZZZZZZ	2639	109200	27118	5557
02:41	ZZZZZZ	2582	109090	26640	5480
02:47	ZZZZZZ	2780	119440	29093	5314
02:53	ZZZZZZ	2806	118600	29153	5363
02:59	ZZZZZZ	2635	108210	26964	5554
03:06	ZZZZZZ	2632	109410	27053	5546
03:12	MP42889-MB1	2672	110280	27359	5631
03:18	MP42889-B1	2630	109130	26832	5482
03:24	MP42889-LC1	2685	112280	27477	5449
03:30	MP42889-S1	2602	110730	26939	5350

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
03:37	MA20616-CCV10	2609	109360	26787	5414
03:43	MA20616-CCB11	2671	110880	27000	5616
03:49	MP42889-S2	2609	109730	26656	5379
03:55	J85557-1	2658	112140	27266	5463
04:01	MP42889-SD1	2665	110770	26804	5591
04:07	MP42889-S3	2575	109790	26456	5224
04:14	MP42889-S4	2650	107240	26935	5375
04:20	J85573-1	2664	113990	27172	5456
04:26	MP42889-SD2	2678	110760	26982	5597
04:32	ZZZZZZ	2688	112250	27556	5380
04:38	ZZZZZZ	2707	113610	27500	5383
04:45	ZZZZZZ	2730	114010	28085	5377
04:51	MA20616-CCV11	2587	109140	26383	5366
04:57	MA20616-CCB12	2663	109380	26819	5594
05:03	ZZZZZZ	2629	112690	27127	5183
05:10	ZZZZZZ	2715	112680	27679	5545
05:16	ZZZZZZ	2691	114180	27351	5538
05:22	ZZZZZZ	11853 !	383580 !	67391 !	21876 !
05:28	ZZZZZZ	2641	110950	26642	5475
05:34	ZZZZZZ	2686	112890	26078	5485
05:40	ZZZZZZ	2782	119230	27402	5517
05:47	ZZZZZZ	2546	110230	26312	5114
05:53	ZZZZZZ	2571	110220	26201	5196
05:59	ZZZZZZ	2638	110540	26041	5340
06:05	MA20616-CCV12	2621	109330	25509	5432
06:11	MA20616-CCB13	2674	109840	26213	5619
06:18	ZZZZZZ	2658	112140	26466	5395
06:24	ZZZZZZ	2692	113610	27110	5433
06:30	ZZZZZZ	2667	110860	26756	5324
06:36	ZZZZZZ	2730	112080	26697	5564
06:42	ZZZZZZ	2662	111740	26510	5455
06:48	MP42895-MB1	2673	110300	26341	5616
06:55	MP42895-LC1	2653	109220	26080	5557

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
07:01	MP42895-S1	2607	109760	25584	5445
07:07	MP42895-S2	2607	109840	25621	5446
07:13	J84786-2	2641	109690	25800	5582
07:19	MA20616-CCV13	2620	109750	25930	5444
07:25	MA20616-CCB14	2691	111010	26137	5660
07:31	MA20616-CRIB3	2695	110880	26315	5665
07:37	MA20616-CRIA3	2694	110830	26033	5670
07:44	MA20616-ICSA3	2424	104870	24349	4909
07:50	MA20616-ICSAB3	2417	106360	24378	4891
07:56	MA20616-CCV14	2645	109870	25563	5499
08:03	MA20616-CCB15	2682	112480	25616	5660
08:09	MP42895-SD1	2697	111810	25953	5705
08:15	ZZZZZZ	2613	110540	25992	5548
08:21	ZZZZZZ	2644	108780	25411	5606
08:27	ZZZZZZ	2628	109640	25541	5582
08:34	ZZZZZZ	2576	110080	25293	5465
08:40	ZZZZZZ	2616	110000	25858	5571
08:46	ZZZZZZ	2661	110230	25513	5660
08:53	ZZZZZZ	2657	110620	26022	5652
08:59	ZZZZZZ	2663	110400	25687	5666
09:05	ZZZZZZ	2613	110920	25420	5544
09:11	MA20616-CCV15	2639	110590	25329	5492
09:17	MA20616-CCB16	2698	110960	25576	5686
09:24	ZZZZZZ	2608	110670	25361	5566
09:30	ZZZZZZ	2506	109940	24644	5264
09:36	ZZZZZZ	2585	110400	25504	5536
09:42	ZZZZZZ	2584	109850	24730	5478
09:49	ZZZZZZ	2591	110130	25000	5472
09:55	ZZZZZZ	2535	109500	24263	5342
10:01	ZZZZZZ	2610	110890	25046	5524
10:07	ZZZZZZ	2611	110810	25183	5561
10:14	ZZZZZZ	2625	110660	25283	5626
10:20	ZZZZZZ	2558	109150	24764	5432

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
10:26	MA20616-CCV16	2605	110600	25140	5472
10:32	MA20616-CCB17	2661	111210	25317	5666
10:39	ZZZZZZ	2630	110240	25296	5625
10:45	ZZZZZZ	2518	109240	24531	5374
10:51	ZZZZZZ	2463	108350	24137	5197
10:57	ZZZZZZ	2646	111180	25247	5652
11:04	ZZZZZZ	2639	110970	25255	5667
11:10	MP42893-MB1	2604	110290	25036	5607
11:16	MP42893-LC1	2598	110000	24909	5565
11:22	MP42893-S1	2251	105170	22694	4660
11:29	MP42893-S2	2258	104260	22575	4669
11:35	J85226-1	2255	104610	22535	4687
11:42	MA20616-CCV17	2560	110220	24296	5423
11:48	MA20616-CCB18	2615	110120	24631	5623
11:54	MP42893-SD1	2488	109290	23699	5322
12:01	ZZZZZZ	2446	108030	23280	5214
12:07	ZZZZZZ	2561	104430	24204	5502
12:13	ZZZZZZ	2552	109750	23848	5474
12:20	ZZZZZZ	2516	108940	23523	5392
12:26	ZZZZZZ	2522	109780	23691	5401
12:32	ZZZZZZ	2534	109730	23604	5446
12:39	ZZZZZZ	2495	108380	23210	5354
12:45	ZZZZZZ	2542	109790	23726	5449
12:51	ZZZZZZ	2461	108720	23073	5215
12:58	MA20616-CCV18	2610	110780	24169	5495
13:04	MA20616-CCB19	2674	111760	24141	5725
13:10	ZZZZZZ	2582	110010	23984	5579
13:16	ZZZZZZ	2571	110010	23676	5535
13:23	ZZZZZZ	2578	112490	24095	5534
13:29	ZZZZZZ	2497	109360	23396	5223
13:35	ZZZZZZ	2563	110150	23796	5496
13:41	ZZZZZZ	2521	109120	23388	5363
13:48	ZZZZZZ	2617	110430	23974	5587

INTERNAL STANDARD SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
Analyst: ND Run ID: MA20616
Parameters: As,Ba,Cd,Cr,Pb,Se,Ag

Time	Sample Description	Istd#1	Istd#2	Istd#3	Istd#4
13:54	ZZZZZZ	2657	112380	24202	5612
14:01	ZZZZZZ	2594	110630	23908	5545
14:07	ZZZZZZ	2534	110030	23527	5361
14:13	MA20616-CCV19	2592	111030	23711	5453
14:19	MA20616-CCB20	2682	111940	24483	5734
14:25	MA20616-ICSA4	2381	107550	22805	4876
14:32	MA20616-ICSAB4	2360	104670	22721	4847
14:38	MA20616-CCV20	2555	111550	24062	5408
14:44	MA20616-CCB21	2626	110730	24095	5643

R = Reference for ISTD limits. ! = Outside limits.

LEGEND:

Istd#	Parameter	Limits
Istd#1	Yttrium (2243)	60-125 %
Istd#2	Yttrium (3600)	60-125 %
Istd#3	Yttrium (3710)	60-125 %
Istd#4	Indium	60-125 %

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA20616 Units: ug/l

Time:			18:02		18:20		18:49		19:58	
Sample ID:			ICB1		CCB2		CCB3		CCB4	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	28	anr							
Antimony	6.0	1.4	anr							
Arsenic	3.0	1.2	0.70	<3.0	1.7	<3.0	0.90	<3.0	1.1	<3.0
Barium	200	1	-0.10	<200	-0.10	<200	0.0	<200	-0.10	<200
Beryllium	1.0	.1	anr							
Boron	100	1.5								
Cadmium	4.0	.4	0.0	<4.0	0.0	<4.0	0.20	<4.0	0.0	<4.0
Calcium	5000	31	anr							
Chromium	10	.3	-0.20	<10	-0.40	<10	0.10	<10	0.0	<10
Cobalt	50	.3	anr							
Copper	25	3	anr							
Iron	100	9	anr							
Lead	3.0	1.2	0.30	<3.0	-0.50	<3.0	0.0	<3.0	-0.50	<3.0
Magnesium	5000	28	anr							
Manganese	15	.1	anr							
Molybdenum	20	.4	anr							
Nickel	40	.3	anr							
Palladium	50	3								
Potassium	10000	50	anr							
Selenium	10	1.1	-0.50	<10	0.10	<10	-0.10	<10	0.10	<10
Silicon	200	3.6								
Silver	10	.6	0.20	<10	0.50	<10	0.20	<10	0.0	<10
Sodium	10000	9	anr							
Strontium	10	.1								
Thallium	2.0	.8	anr							
Tin	10	.8								
Titanium	10	.3								
Vanadium	50	.4	anr							
Zinc	20	2	anr							

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP
QC Limits: result < RL

Date Analyzed: 03/14/08
Run ID: MA20616

Methods: EPA 200.7, SW846 6010B
Units: ug/l

Time:			21:06		22:21		23:22		00:36	
Sample ID:			CCB5		CCB6		CCB7		CCB8	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	28	anr							
Antimony	6.0	1.4	anr							
Arsenic	3.0	1.2	1.1	<3.0	0.40	<3.0	1.0	<3.0	1.5	<3.0
Barium	200	1	0.0	<200	0.0	<200	0.0	<200	0.0	<200
Beryllium	1.0	.1	anr							
Boron	100	1.5								
Cadmium	4.0	.4	0.10	<4.0	0.10	<4.0	0.0	<4.0	0.0	<4.0
Calcium	5000	31	anr							
Chromium	10	.3	-0.20	<10	-0.30	<10	-0.10	<10	-0.10	<10
Cobalt	50	.3	anr							
Copper	25	3	anr							
Iron	100	9	anr							
Lead	3.0	1.2	-0.40	<3.0	0.0	<3.0	-0.60	<3.0	0.30	<3.0
Magnesium	5000	28	anr							
Manganese	15	.1	anr							
Molybdenum	20	.4	anr							
Nickel	40	.3	anr							
Palladium	50	3								
Potassium	10000	50	anr							
Selenium	10	1.1	-0.10	<10	-0.30	<10	-0.10	<10	-1.1	<10
Silicon	200	3.6								
Silver	10	.6	0.50	<10	0.30	<10	0.40	<10	0.10	<10
Sodium	10000	9	anr							
Strontium	10	.1								
Thallium	2.0	.8	anr							
Tin	10	.8								
Titanium	10	.3								
Vanadium	50	.4	anr							
Zinc	20	2	anr							

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA20616 Units: ug/l

Time:			01:13	
Sample ID:			CCB9	
Metal	RL	IDL	raw	final
Aluminum	200	28	anr	
Antimony	6.0	1.4	anr	
Arsenic	3.0	1.2	0.60	<3.0
Barium	200	1	0.10	<200
Beryllium	1.0	.1	anr	
Boron	100	1.5		
Cadmium	4.0	.4	0.0	<4.0
Calcium	5000	31	anr	
Chromium	10	.3	0.0	<10
Cobalt	50	.3	anr	
Copper	25	3	anr	
Iron	100	9	anr	
Lead	3.0	1.2	-1.0	<3.0
Magnesium	5000	28	anr	
Manganese	15	.1	anr	
Molybdenum	20	.4	anr	
Nickel	40	.3	anr	
Palladium	50	3		
Potassium	10000	50	anr	
Selenium	10	1.1	-0.50	<10
Silicon	200	3.6		
Silver	10	.6	0.0	<10
Sodium	10000	9	anr	
Strontium	10	.1		
Thallium	2.0	.8	anr	
Tin	10	.8		
Titanium	10	.3		
Vanadium	50	.4	anr	
Zinc	20	2	anr	

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20616 Units: ug/l

Time:		18:08	
Sample ID:	ICCV	ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	2000	2010	100.5
Barium	2000	2070	103.5
Beryllium	anr		
Boron			
Cadmium	2000	2010	100.5
Calcium	anr		
Chromium	2000	2020	101.0
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	2000	2010	100.5
Magnesium	anr		
Manganese	anr		
Molybdenum	anr		
Nickel	anr		
Palladium			
Potassium	anr		
Selenium	2000	2010	100.5
Silicon			
Silver	250	248	99.2
Sodium	anr		
Strontium			
Thallium	anr		
Tin			
Titanium			
Vanadium	anr		
Zinc	anr		

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20616 Units: ug/l

Time:		17:53			18:43			19:52	
Sample ID:	ICV	ICV1		CCV	CCV2		CCV	CCV3	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	1000	997	99.7	2000	2020	101.0	2000	2000	100.0
Barium	1000	1020	102.0	2000	2070	103.5	2000	2050	102.5
Beryllium	anr								
Boron									
Cadmium	1000	1010	101.0	2000	2020	101.0	2000	2000	100.0
Calcium	anr								
Chromium	1000	1010	101.0	2000	2020	101.0	2000	2020	101.0
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	1000	1020	102.0	2000	2020	101.0	2000	2010	100.5
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	1000	997	99.7	2000	2010	100.5	2000	2000	100.0
Silicon									
Silver	500	473	94.6*(a)	250	247	98.8	250	246	98.4
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested
(a) Within 90 to 110 percent limits required for SW846 6010. No EPA 200.7 samples reported for this element in the area bracketed by this QC.

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20616 Units: ug/l

Time: Sample ID: Metal	CCV True	21:00 CCV4 Results	% Rec	CCV True	22:15 CCV5 Results	% Rec	CCV True	23:16 CCV6 Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	2000	2030	101.5	2000	2020	101.0	2000	2000	100.0
Barium	2000	2060	103.0	2000	2060	103.0	2000	2060	103.0
Beryllium	anr								
Boron									
Cadmium	2000	2030	101.5	2000	2010	100.5	2000	2000	100.0
Calcium	anr								
Chromium	2000	2020	101.0	2000	2030	101.5	2000	2020	101.0
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	2000	2030	101.5	2000	2030	101.5	2000	2010	100.5
Magnesium	anr								
Manganese	anr								
Molybdenum	anr								
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	2000	2020	101.0	2000	2010	100.5	2000	2000	100.0
Silicon									
Silver	250	247	98.8	250	248	99.2	250	247	98.8
Sodium	anr								
Strontium									
Thallium	anr								
Tin									
Titanium									
Vanadium	anr								
Zinc	anr								

(*) Outside of QC limits
(anr) Analyte not requested

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20616 Units: ug/l

Time:		00:30			01:07	
Sample ID:	CCV	CCV7		CCV	CCV8	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum	anr					
Antimony	anr					
Arsenic	2000	2010	100.5	2000	2000	100.0
Barium	2000	2060	103.0	2000	2010	100.5
Beryllium	anr					
Boron						
Cadmium	2000	2000	100.0	2000	1990	99.5
Calcium	anr					
Chromium	2000	2030	101.5	2000	2030	101.5
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	2000	2040	102.0	2000	2040	102.0
Magnesium	anr					
Manganese	anr					
Molybdenum	anr					
Nickel	anr					
Palladium						
Potassium	anr					
Selenium	2000	2000	100.0	2000	1990	99.5
Silicon						
Silver	250	246	98.4	250	247	98.8
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

(*) Outside of QC limits
(anr) Analyte not requested

HIGH STANDARD CHECK SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA20616 Units: ug/l

Time:		17:31	
Sample ID:	HSTD	HSTD1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	4000	4000	100.0
Barium	4000	4030	100.8
Beryllium	anr		
Boron			
Cadmium	4000	4000	100.0
Calcium	anr		
Chromium	4000	3970	99.3
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	4000	4010	100.3
Magnesium	anr		
Manganese	anr		
Molybdenum	anr		
Nickel	anr		
Palladium			
Potassium	anr		
Selenium	4000	4000	100.0
Silicon			
Silver	500	498	99.6
Sodium	anr		
Strontium			
Thallium	anr		
Tin			
Titanium			
Vanadium	anr		
Zinc	anr		

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 50 to 150 % Recovery Run ID: MA20616 Units: ug/l

Time:			17:45		00:48	
Sample ID:	CRI	CRIA	CRIA1		CRIA2	
Metal	True	True	Results	% Rec	Results	% Rec
Aluminum						
Antimony	120	10				
Arsenic	20	6.0				
Barium	400					
Beryllium	10	2.0	anr			
Boron						
Cadmium	10					
Calcium						
Chromium	20					
Cobalt	100					
Copper	50					
Iron						
Lead	6.0	6.0				
Magnesium						
Manganese	30					
Molybdenum	40					
Nickel	80					
Palladium	100					
Potassium						
Selenium	10	10				
Silicon						
Silver	20					
Sodium						
Strontium						
Thallium	20	4.0				
Tin						
Titanium						
Vanadium	100					
Zinc	40					

(*) Outside of QC limits
(anr) Analyte not requested

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP
QC Limits: 50 to 150 % Recovery

Date Analyzed: 03/14/08
Run ID: MA20616

Methods: EPA 200.7, SW846 6010B
Units: ug/l

Time:		17:38		00:42	
Sample ID:	CRIB	CRIB1		CRIB2	
Metal	True	Results	% Rec	Results	% Rec
Aluminum	400				
Antimony	12				
Arsenic	16	19.1	119.4	20.5	128.1
Barium	400	415	103.8	421	105.3
Beryllium	2.0				
Boron	200				
Cadmium	8.0	8.4	105.0	8.5	106.3
Calcium	5000				
Chromium	20	21.4	107.0	21.9	109.5
Cobalt	100				
Copper	50				
Iron	200				
Lead	6.0	6.0	100.0	6.6	110.0
Magnesium	5000				
Manganese	30				
Molybdenum	40				
Nickel	80				
Palladium	100				
Potassium	10000				
Selenium	20	20.9	104.5	19.9	99.5
Silicon	400				
Silver	20	20.3	101.5	20.4	102.0
Sodium	10000				
Strontium	20				
Thallium	20				
Tin	20				
Titanium	20				
Vanadium	100				
Zinc	40				

(*) Outside of QC limits
(anr) Analyte not requested

INTERFERING ELEMENT CHECK STANDARDS SUMMARY
Part 1 - ICSA and ICSAB Standards

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

File ID: SB031408M2.ICP Date Analyzed: 03/14/08 Methods: EPA 200.7, SW846 6010B
QC Limits: 80 to 120 % Recovery Run ID: MA20616 Units: ug/l

Time: Sample ID: Metal	ICSA True	ICSAB True	18:30 ICSA1 Results	% Rec	18:36 ICSAB1 Results	% Rec	00:55 ICSA2 Results	% Rec	01:01 ICSAB2 Results	% Rec
Aluminum	500000	500000	495000	99.0	489000	97.8	481000	96.2	484000	96.8
Antimony		1000	-4.1		1030	103.0	-2.0		1030	103.0
Arsenic		1000	0.90		973	97.3	3.7		976	97.6
Barium		500	2.0		511	102.2	2.1		513	102.6
Beryllium		500	0.0		496	99.2	0.0		492	98.4
Boron			-0.70		-11		-0.40		-9.7	
Cadmium		1000	1.4		1050	105.0	1.1		1040	104.0
Calcium	400000	400000	374000	93.5	372000	93.0	370000	92.5	375000	93.8
Chromium		500	0.40		477	95.4	0.40		489	97.8
Cobalt		500	5.8		498	99.6	5.9		490	98.0
Copper		500	1.8		487	97.4	-1.4		474	94.8
Iron	200000	200000	182000	91.0	179000	89.5	178000	89.0	177000	88.5
Lead		1000	0.20		956	95.6	5.6		979	97.9
Magnesium	500000	500000	511000	102.2	504000	100.8	503000	100.6	501000	100.2
Manganese		500	0.20		488	97.6	0.10		499	99.8
Molybdenum		500	-1.7		489	97.8	-2.1		490	98.0
Nickel		1000	-2.9		951	95.1	-2.6		947	94.7
Palladium		500	-0.10		520	104.0	-0.30		532	106.4
Potassium			-15		-26		-20		-15	
Selenium		1000	-0.80		985	98.5	-1.6		984	98.4
Silicon			-28		-6.2		-28		-4.7	
Silver		1000	0.30		1010	101.0	0.60		1040	104.0
Sodium			19.6		18.3		14.8		15.9	
Strontium			0.40		0.50		0.40		0.40	
Thallium		1000	-3.3		968	96.8	-2.5		982	98.2
Tin			1.6		1.3		0.90		0.70	
Titanium			2.4		2.6		2.3		2.6	
Vanadium		500	1.4		484	96.8	3.0		490	98.0
Zinc		1000	0.30		953	95.3	0.60		948	94.8

(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42805
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/07/08

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.033	.015	.022	-0.0077	<0.033

Associated samples MP42805: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42805
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/07/08

Metal	J84631-5 Original	MS	Spikelot HGPWS1	% Rec	QC Limits
Mercury	0.64	0.99	0.351	99.7	58-143

Associated samples MP42805: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42805
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/07/08

Metal	J84631-5 Original	MSD	Spikelot HGPWS1	% Rec	MSD RPD	QC Limit
Mercury	0.64	0.98	0.331	102.6	1.0	32

Associated samples MP42805: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42805
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/07/08

Metal	LCS Result	Spikelot HGLCS54540	% Rec	QC Limits
Mercury	5.5	5.8	94.8	66-133

Associated samples MP42805: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42818
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/08/08

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	2.8	4.6		
Antimony	2.0	.14	.24		
Arsenic	2.0	.12	.24	0.030	<2.0
Barium	20	.1	.07	0.020	<20
Beryllium	0.50	.01	.015		
Boron	10	.15	.23		
Cadmium	0.50	.04	.024	0.010	<0.50
Calcium	500	3.1	7.9		
Chromium	1.0	.03	.078	0.030	<1.0
Cobalt	5.0	.03	.051		
Copper	2.5	.3	.28		
Iron	10	.9	.95		
Lead	2.0	.12	.19	-0.040	<2.0
Magnesium	500	2.8	3.8		
Manganese	1.5	.01	.12		
Molybdenum	2.0	.04	.086		
Nickel	4.0	.03	.057		
Palladium	5.0	.3	.24		
Potassium	1000	5	9.8		
Selenium	2.0	.11	.26	-0.010	<2.0
Silicon	20	.36	2.8		
Silver	1.0	.06	.11	0.020	<1.0
Sodium	1000	.9	4.3		
Strontium	1.0	.01	.1		
Thallium	1.0	.08	.13		
Tin	5.0	.08	.59		
Titanium	1.0	.03	.17		
Vanadium	5.0	.04	.085		
Zinc	2.0	.2	.49		

Associated samples MP42818: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42818
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/08/08

Metal	J85081-1 Original	MS	Spikelot MPIRS1	% Rec	QC Limits
Aluminum	anr				
Antimony	anr				
Arsenic	6.1	453	484	92.2	75-125
Barium	129	594	484	96.0	75-125
Beryllium	anr				
Boron					
Cadmium	0.61	12.8	12.1	100.6	75-125
Calcium	anr				
Chromium	22.6	67.7	48.4	93.1	75-125
Cobalt	anr				
Copper	anr				
Iron	anr				
Lead	142	264	121	100.7	75-125
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Palladium					
Potassium	anr				
Selenium	0.25	462	484	95.3	75-125
Silicon					
Silver	0.0	12.0	12.1	99.1	75-125
Sodium	anr				
Strontium					
Thallium	anr				
Tin					
Titanium					
Vanadium	anr				
Zinc	anr				

Associated samples MP42818: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42818
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/08/08

Metal	J85081-1 Original	MSD	Spikelot MPIRS1	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	6.1	450	456	97.3	0.7	20
Barium	129	586	456	100.2	1.4	20
Beryllium	anr					
Boron						
Cadmium	0.61	13.1	11.4	109.6	2.3	20
Calcium	anr					
Chromium	22.6	63.7	45.6	90.1	6.1	20
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	142	265	114	107.9	0.4	20
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Palladium						
Potassium	anr					
Selenium	0.25	435	456	95.3	6.0	20
Silicon						
Silver	0.0	11.7	11.4	102.6	2.5	20
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

Associated samples MP42818: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42818
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:			03/08/08				03/08/08	
Metal	BSP Result	Spikelot MPIRS1	% Rec	QC Limits	LCS Result	Spikelot MPLC54-540	% Rec	QC Limits
Aluminum	anr							
Antimony	anr							
Arsenic	378	400	94.5	80-120	147	151	97.4	77-123
Barium	401	400	100.3	80-120	271	272	99.6	82-118
Beryllium	anr							
Boron								
Cadmium	10.3	10	103.0	80-120	93.0	95.3	97.6	80-120
Calcium	anr							
Chromium	42.5	40	106.3	80-120	121	120	100.8	81-119
Cobalt	anr							
Copper	anr							
Iron	anr							
Lead	101	100	101.0	80-120	119	120	99.2	78-121
Magnesium	anr							
Manganese	anr							
Molybdenum								
Nickel	anr							
Palladium								
Potassium	anr							
Selenium	383	400	95.8	80-120	137	138	99.3	78-122
Silicon								
Silver	10.2	10	102.0	80-120	90.4	96.8	93.4	66-133
Sodium	anr							
Strontium								
Thallium	anr							
Tin								
Titanium								
Vanadium	anr							
Zinc	anr							

Associated samples MP42818: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42818
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date: 03/08/08

Metal	J85081-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	54.3	56.7	4.4	0-10
Barium	1150	1180	2.5	0-10
Beryllium	anr			
Boron				
Cadmium	5.50	4.10	25.5 (a)	0-10
Calcium	anr			
Chromium	202	221	9.7	0-10
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	1270	1330	5.3	0-10
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Palladium				
Potassium	anr			
Selenium	2.20	0.00	100.0(a)	0-10
Silicon				
Silver	0.00	0.00	NC	0-10
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP42818: J84702-1, J84702-2, J84702-3, J84702-4, J84702-5, J84702-6

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42872
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/13/08

Metal	RL	IDL	MDL	MB raw	final
Mercury	0.033	.015	.022	-0.0072	<0.033

Associated samples MP42872: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42872
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/13/08

Metal	J84702-7 Original	MS	Spikelot HGPWS1	% Rec	QC Limits
Mercury	0.0	0.40	0.345	115.9	58-143

Associated samples MP42872: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42872
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/13/08

Metal	J84702-7 Original	MSD	Spikelot HGPWS1	% Rec	MSD RPD	QC Limit
Mercury	0.0	0.41	0.332	123.4	2.5	32

Associated samples MP42872: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42872
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 03/13/08

Metal	LCS Result	Spikelot HGLCS54540	% Rec	QC Limits
Mercury	4.9	5.8	84.5	66-133

Associated samples MP42872: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42888
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/14/08

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	2.8	4.6		
Antimony	2.0	.14	.24		
Arsenic	2.0	.12	.24	0.25	<2.0
Barium	20	.1	.07	0.020	<20
Beryllium	0.50	.01	.015		
Boron	10	.15	.23		
Cadmium	0.50	.04	.024	-0.010	<0.50
Calcium	500	3.1	7.9		
Chromium	1.0	.03	.078	0.0	<1.0
Cobalt	5.0	.03	.051		
Copper	2.5	.3	.28		
Iron	10	.9	.95		
Lead	2.0	.12	.19	0.080	<2.0
Magnesium	500	2.8	3.8		
Manganese	1.5	.01	.12		
Molybdenum	2.0	.04	.086		
Nickel	4.0	.03	.057		
Palladium	5.0	.3	.24		
Potassium	1000	5	9.8		
Selenium	2.0	.11	.26	-0.12	<2.0
Silicon	20	.36	2.8		
Silver	1.0	.06	.11	0.040	<1.0
Sodium	1000	.9	4.3		
Strontium	1.0	.01	.1		
Thallium	1.0	.08	.13		
Tin	5.0	.08	.59		
Titanium	1.0	.03	.17		
Vanadium	5.0	.04	.085		
Zinc	2.0	.2	.49		

Associated samples MP42888: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42888
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/14/08

Metal	J84702-7 Original	MS	Spikelot MPIRS1	% Rec	QC Limits
Aluminum	anr				
Antimony	anr				
Arsenic	4.8	368	425	85.5	75-125
Barium	212	498	425	67.3N(a)	75-125
Beryllium	anr				
Boron					
Cadmium	0.12	9.4	10.6	87.4	75-125
Calcium	anr				
Chromium	14.3	50.8	42.5	85.9	75-125
Cobalt	anr				
Copper	anr				
Iron	anr				
Lead	8.6	99.6	106	85.7	75-125
Magnesium	anr				
Manganese	anr				
Molybdenum					
Nickel	anr				
Palladium					
Potassium	anr				
Selenium	0.0	370	425	87.1	75-125
Silicon					
Silver	0.0	9.7	10.6	91.3	75-125
Sodium	anr				
Strontium					
Thallium	anr				
Tin					
Titanium					
Vanadium	anr				
Zinc	anr				

Associated samples MP42888: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested
(a) Spike recovery indicates possible matrix interference and/or sample nonhomogeneity.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42888
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 03/14/08

Metal	J84702-7 Original	MSD	Spikelot MPIRS1	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	4.8	377	429	86.7	2.4	20
Barium	212	600	429	90.4	18.6	20
Beryllium	anr					
Boron						
Cadmium	0.12	9.8	10.7	90.2	4.2	20
Calcium	anr					
Chromium	14.3	55.4	42.9	95.8	8.7	20
Cobalt	anr					
Copper	anr					
Iron	anr					
Lead	8.6	105	107	89.9	5.3	20
Magnesium	anr					
Manganese	anr					
Molybdenum						
Nickel	anr					
Palladium						
Potassium	anr					
Selenium	0.0	377	429	87.9	1.9	20
Silicon						
Silver	0.0	10	10.7	93.2	3.0	20
Sodium	anr					
Strontium						
Thallium	anr					
Tin						
Titanium						
Vanadium	anr					
Zinc	anr					

Associated samples MP42888: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42888
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:			03/14/08				03/14/08	
Metal	BSP Result	Spikelot MPIRS1	% Rec	QC Limits	LCS Result	Spikelot MPLC54-540	% Rec	QC Limits
Aluminum	anr							
Antimony	anr							
Arsenic	372	400	93.0	80-120	161	151	106.6	77-123
Barium	404	400	101.0	80-120	298	272	109.6	82-118
Beryllium	anr							
Boron								
Cadmium	9.4	10	94.0	80-120	102	95.3	107.0	80-120
Calcium	anr							
Chromium	41.5	40	103.8	80-120	140	120	116.7	81-119
Cobalt	anr							
Copper	anr							
Iron	anr							
Lead	98.7	100	98.7	80-120	131	120	109.2	78-121
Magnesium	anr							
Manganese	anr							
Molybdenum								
Nickel	anr							
Palladium								
Potassium	anr							
Selenium	377	400	94.3	80-120	148	138	107.2	78-122
Silicon								
Silver	10	10	100.0	80-120	101	96.8	104.3	66-133
Sodium	anr							
Strontium								
Thallium	anr							
Tin								
Titanium								
Vanadium	anr							
Zinc	anr							

Associated samples MP42888: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: J84702
Account: SHAWNJL - Shaw E & I, Inc.
Project: ER-0435

QC Batch ID: MP42888
Matrix Type: SOLID

Methods: SW846 6010B
Units: ug/l

Prep Date: 03/14/08

Metal	J84702-7 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	45.9	54.3	18.3 (a)	0-10
Barium	2020	2120	5.1	0-10
Beryllium	anr			
Boron				
Cadmium	1.10	0.00	100.0(a)	0-10
Calcium	anr			
Chromium	136	149	9.5	0-10
Cobalt	anr			
Copper	anr			
Iron	anr			
Lead	82.1	87.1	6.1	0-10
Magnesium	anr			
Manganese	anr			
Molybdenum				
Nickel	anr			
Palladium				
Potassium	anr			
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.00	0.00	NC	0-10
Sodium	anr			
Strontium				
Thallium	anr			
Tin				
Titanium				
Vanadium	anr			
Zinc	anr			

Associated samples MP42888: J84702-7

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits
(anr) Analyte not requested
(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Percent Solids Raw Data Summary

Percent Solids Raw Data Summary

Job Number: J84702
Account: SHAWNJL Shaw E & I, Inc.
Project: ER-0435

Sample: J84702-1 **Analyzed:** 14-MAR-08 by NS **Method:** EPA 160.3 M
ClientID: B4 HOMOGENIZED

Wet Weight (Total)	29.53	g
Tare Weight	25.45	g
Dry Weight (Total)	28.95	g
Solids, Percent	85.8	%

Sample: J84702-2 **Analyzed:** 14-MAR-08 by NS **Method:** EPA 160.3 M
ClientID: 7881-5

Wet Weight (Total)	32.09	g
Tare Weight	28.45	g
Dry Weight (Total)	31.53	g
Solids, Percent	84.6	%

Sample: J84702-3 **Analyzed:** 14-MAR-08 by NS **Method:** EPA 160.3 M
ClientID: 7881-1

Wet Weight (Total)	31.53	g
Tare Weight	27.79	g
Dry Weight (Total)	31.24	g
Solids, Percent	92.2	%

Sample: J84702-4 **Analyzed:** 14-MAR-08 by NS **Method:** EPA 160.3 M
ClientID: 7886-1

Wet Weight (Total)	29.02	g
Tare Weight	24.7	g
Dry Weight (Total)	27.62	g
Solids, Percent	67.6	%

Sample: J84702-5 **Analyzed:** 14-MAR-08 by NS **Method:** EPA 160.3 M
ClientID: 7886-10

Wet Weight (Total)	27.08	g
Tare Weight	23.78	g
Dry Weight (Total)	26.78	g
Solids, Percent	90.9	%

Sample: J84702-6 **Analyzed:** 14-MAR-08 by NS **Method:** EPA 160.3 M
ClientID: 7886-14

Wet Weight (Total)	31.39	g
Tare Weight	27.48	g
Dry Weight (Total)	29.99	g
Solids, Percent	64.2	%

Percent Solids Raw Data Summary

Job Number: J84702
Account: SHAWNJL Shaw E & I, Inc.
Project: ER-0435

Sample: J84702-7 **Analyzed:** 14-MAR-08 by NS **Method:** EPA 160.3 M
ClientID: 7881-17

Wet Weight (Total)	26.12	g
Tare Weight	23.77	g
Dry Weight (Total)	25.94	g
Solids, Percent	92.3	%