



DEPARTMENT OF THE ARMY
HEADQUARTERS, U.S. ARMY GARRISON FORT MONMOUTH
FORT MONMOUTH, NEW JERSEY 07703-5000

REPLY TO
ATTENTION OF

Directorate of Public Works

March 9, 2011

Larry Quinn, Site Manager
New Jersey Department of Environmental Protection
Bureau of Investigation, Design and Construction
401 East State Street, P.O. Box 413
Trenton, New Jersey 08625-0413

Subject: Base-Wide Glauconitic Soil Sampling Report
Fort Monmouth – Main Post Area
Fort Monmouth, New Jersey 07703

Dear Mr. Quinn:

On October 13, 2010, the U.S. Army Fort Monmouth, Directorate of Public Works (DPW) submitted a *Base-Wide Glauconitic Soil Sampling Plan* to determine if selected Target Analyte List (TAL) metals detected in groundwater at concentrations exceeding the New Jersey Department of Environmental Protection (NJDEP) Ground Water Quality Standards (GWQS) are naturally occurring in soils containing high amounts of glauconite. On October 29, 2010, the NJDEP provided written approval of the *Base-Wide Glauconitic Soil Sampling Plan* (Attachment 1).

Background

TAL metals which have been detected in samples collected from onsite groundwater monitoring wells at concentrations exceeding the GWQS include, but are not limited to: arsenic, antimony, beryllium, cadmium, lead, and zinc. There is no documented or confirmed source identified for the detections of these metals in groundwater. Several sites at Fort Monmouth are solid waste landfills containing various materials but most sites are associated with petroleum hydrocarbons resulting from leaking underground storage tanks (USTs).

Dooley (2001) analyzed the composition of naturally-occurring glauconitic soils at seven locations within the New Jersey Coastal Plain physiographic province. This study revealed that glauconitic soils contained arsenic at concentrations ranging from 7 to 31 milligrams per kilogram (mg/kg). There is evidence for a relationship between the type of geologic unit and concentrations of arsenic in the soil found in the New Jersey Coastal Plain (Rutgers, 2002). The geologic creation of arsenic-bearing glauconite is the result of depositions of algae that take up, metabolize, and retain arsenic in surface waters. When the algae dies and settles to the bottom, the arsenic in the dead algae becomes part of the deposit. When this process occurs over thousands of years, arsenic accumulates in estuaries, which are now geologically mapped as glauconite or "greensands". Glauconite is a dull-green, iron-silicate mica mineral found in shallow marine sediments.

Layers of glauconite have been identified in the New Jersey Coastal Plain, southern New Castle County, Delaware, and in the deeper units in southern Delaware. The soils that form over these glauconite-containing units, called greensands, are highly productive agriculturally and have

been determined to contain naturally-occurring arsenic and beryllium as reported by Dooley (2001).

The United States Geological Survey (USGS) reported arsenic concentrations ranging from 4.8 to 23 mg/kg in sediments collected from the Lower Susquehanna River. Similar concentrations of arsenic were found in another USGS study in which the average arsenic soil concentrations were reported as 8.3 mg/kg for New Castle County, Delaware, 4.6 mg/kg for Kent County, Delaware, and 4.9 mg/kg for Sussex County, New Jersey (USGS, 1984).

These studies indicate that the presence of arsenic and other TAL metals (e.g., beryllium, lead) detected in soil and sediment samples are attributed to natural (lithogenic) sources rather than from anthropogenic activities. In an effort to confirm and document that select TAL metals detected in groundwater on the Main Post are naturally associated with glauconitic soils, the DPW conducted a soil sampling investigation. This investigative study was necessary because the DPW believes the presence of naturally-occurring TAL metals in onsite glauconitic soils are adversely affecting groundwater quality conditions as defined by the NJDEP GWQS.

The DPW conducted an exhaustive review of all logs for monitoring wells installed at the Main Post to identify locations where the word 'glauconitic' or variations thereof (e.g. glauconite, green sands) were recorded. Glauconitic sands, silts, and/or clays were positively identified at sites 108, 296, and the M-2 Landfill. A brief summary of each site as described in the U.S. Army's *Environmental Condition of Property Report* (2007) is provided as follows:

- **Site 108** is near Riverside Avenue in the eastern section of the Main Post. The DPW removed five USTs in this area in November 1993. The site was reported to the NJDEP as a discharge to the environment and Incident No. 93-04-12-1939-29 was assigned.
- **Site 296** a former fuel distribution facility on Sherrill Avenue which was abandoned and then rediscovered during a renovation project at Building 296. The facility dates back to the 1940s. The UST system was comprised of ten 1,000-gallon USTs which stored various types of fuel products. These products were distributed from remote pumping islands located >450 feet from the UST field and within 50 feet of Parkers Creek.
- **M-2 Landfill.** The 6.5-acre landfill operated from 1964 until 1968. Materials disposed at the landfill reportedly included: construction debris, scrap metal, asbestos containing materials, vegetative waste, unwashed containers which previously held hazardous materials/wastes, outdated photographic chemicals, small quantities of outdated drugs, sludge from the STP, soot and boiler scale, incinerator ash, oil spill debris, oil filters, batteries, fluorescent tubes, and electronic components.

At each of the above locations, arsenic and lead were detected in groundwater at concentrations exceeding the GWQS of 3 and 5 micrograms per liter (µg/L), respectively. It is important to note that glauconitic-rich soils are more prevalent on the Main Post than the well logs would indicate because the well logs were not properly completed by trained personnel, e.g., soil scientist, geologist, etc. The majority of the well logs were prepared by the well drillers who have little to no training properly classifying soils using an accepted classification scheme (i.e. Unified Soil Classification System, Burmister, etc.).

According to Jablonski (1968), the Cretaceous-age Red Bank and Tinton Sands outcrop at the Main Post. The Red Bank sand conformably overlies the Navesink Formation. The upper member of the Red Bank Sand (Shrewsbury) is a yellowish-gray to reddish-brown, clayey, medium to coarse-grained sand that contains abundant rock fragments, muscovite, and glauconite. The lower member (Sandy Hook) is a dark gray to black, medium to fine-grained sand with abundant clay, muscovite and glauconite.

The Tinton Sand conformably overlies the Red Bank sand and ranges from a clayey medium to very coarse-grained feldspathic quartz and glauconitic coarse sand. The color varies from a yellowish-orange or light brown to light olive to grayish-olive. Glauconite may comprise 60 to 80% of the sand fraction in the upper portion of the Tinton Sand (Minard, 1969).

Soil and Groundwater Investigation

The soil investigation included the collection of soil samples at locations depicted on **Figure 1**. Each soil boring was advanced proximate, but not less than five feet, to the selected groundwater monitoring well where glauconite was observed during well installation activities. Geologic logs, including construction details, for the selected groundwater monitoring wells (108MW04, 296MW04, M2MW13, M2MW18, and M2MW24) are provided in **Attachment 2**.

At each soil boring, a direct-push rig (Geoprobe[®]) was used to advance a borehole to the depth of the proximate groundwater monitoring well. Continuous soil cores were collected by advancing dedicated acetate sleeves from the ground surface to the depth of the proximate groundwater monitoring well. Discrete soil samples from the saturated zone (water table to the bottom of the well screen as determined from the proximate monitoring well) were collected for laboratory analysis. Additional discrete soil samples were collected from the saturated zone for laboratory analysis based on lithology differing from that containing greenish glauconitic sands and silts. Prior to sample collection, any twigs, roots, and miscellaneous debris (e.g. glass, bricks, etc.) were removed from the soil sample using a decontaminated stainless steel spoon. Soil boring logs and maps showing locations of the soil borings are provided in **Attachment 3**.

All method(s)/procedure(s) for collecting grab soil samples were consistent with the methodology for obtaining Non-Volatile Organic Compound Sample Collection for Soils as per NJDEP's August 2005 *Field Sampling Procedures Manual* (Section 6.2.8). Decontamination of field sampling equipment was conducted in accordance with the DPW's *Standard Operating Procedures* (SOP) and NJDEP's August 2005 *Field Sampling Procedures Manual* (FSPM).

Subsequent to the collection of soil samples, groundwater samples were collected from the proximate monitoring well via the low-flow purging and sampling method. Applicable protocols regarding sampling, handling, storage, preservation, reporting, decontamination of field equipment, and other procedures adhered to the DPW's latest SOP for low-flow groundwater sampling (**Attachment 4**), which complies with the NJDEP FSPM.

All soil and groundwater samples were analyzed at DPW's NJDEP certified laboratory (NJDEP Certification Number 13461) for Target Analyte List (TAL) metals and Accutest Laboratories (NJDEP Certification Number 12129) for Organic Carbon (OC) using United States Environmental Protection Agency approved test methods. Soil samples were analyzed for OC not as part of the glauconitic study. Rather the OC data was used to support the fate and transport modeling effort being conducted by Brinkerhoff Environmental Services, Inc. on the Main Post.

Summary of Soil Results

A total of six soil samples were collected at three locations, namely at locations proximate to groundwater monitoring wells M2MW13, 108MW04, and 296MW06 (**Table 1**). Soil samples were not collected as proposed at M2MW18 and M2MW24 due to refusal at each location.

A review of analytical results indicates that the following metals were detected in the soil samples: aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), cadmium (Cd), calcium, chromium (Cr), cobalt, copper, iron, lead, magnesium, manganese (Mn), mercury, nickel (Ni), potassium, silver (Ag), vanadium (V), and zinc (Zn). Selenium, sodium, and thallium were not detected in all soil samples.

Arsenic concentrations were detected at all locations and sample depths. Concentrations of arsenic in samples collected from Sites M-2 and 296 were consistent. Concentrations of arsenic at M-2 and 296 in the shallow (non-glaucanitic layer) soil samples were 7 and 5 milligrams/kilogram (mg/kg), respectively. Similarly, concentrations of arsenic at M-2 and 296 in the deeper (glaucanite-rich layer) soil samples were 7 and 6 mg/kg, respectively. At Site 108, the concentration of arsenic in the soil sample collected 7.0-8.0 feet below ground surface (bgs) was five times greater than the arsenic concentration in the shallower sample (**Table 1**). Concentrations of TAL metals in the shallow soil samples were within an order of magnitude of concentrations of TAL metals detected in the deeper soil samples (**Table 1**). All TAL metal concentrations were compliant with the NJDEP Soil Remediation Standards (SRS) as promulgated by the NJDEP in June 2008 (New Jersey Administrative Code 7:26D). The laboratory analytical reports are included in **Attachment 5**.

Table 1. Concentrations of Selected TAL Metals and OC in Soil

Sample Depth (feet bgs)	Ag	Al	As	Ba	Be	Cd	Cr	Mn	Ni	Pb	Sb	V	Zn	OC
mg/kg (dry weight)														
Site M-2														
8.0–12.0	6	9550	7	70	2	2	106	27	15	9	2	45	63	87700
16.0–20.0*	14	11500	7	17	2	4	134	13	10	10	1	25	67	762
Site 108														
6.5–7.0	1	2540	3	5	0.3	0.6	18	9	2	16	ND	11	13	558
7.0–8.0*	2	8110	15	16	0.8	2	65	23	4	16	1	36	29	365
Site 296														
3.5–4.0	1	3560	5	4	0.5	1	73	3	2	11	3	65	13	500
12.0–12.5*	2	4860	6	27	0.8	2	69	17	5	12	2	39	27	1010
NJDEP SRS	390	78000	19	16000	16	78	—	11000	1600	400	31	78	23000	—

* — Glaucanitic-rich layer; ND: not detected.

Summary of Groundwater Results

Six groundwater samples were collected from three monitoring wells, namely M2MW13, 108MW04, and 296MW06. Aqueous samples were collected at two different depths as noted in **Table 2**.

A comparison of TAL metal concentrations in the shallow and deep sampling depths show variations but are within an order of magnitude. Arsenic concentrations were detected at all three locations and sample depths. Concentrations of arsenic detected in groundwater samples ranged from 2.21 to 8.77 µg/L. The GWQS for arsenic is 3 µg/L. Arsenic concentrations exceeded the GWQS in three of the six groundwater samples. Concentrations of arsenic were nearly consistent

at both sampling depth intervals at M2MW13 (**Table 2**). The concentration of arsenic reported in the water sample collected from 296MW06 at 3.7 feet bgs (4.38 µg/L) was greater than the arsenic concentration detected in the deeper sample (2.69 µg/L at 12.25 feet bgs). Conversely, the arsenic concentration detected at 6.75 feet bgs at 108MW04 (4.94 µg/L) was less than the arsenic concentration detected in the water sample collected from 7.5 feet bgs (8.77 µg/L). The laboratory analytical reports are included in **Attachment 6**.

Table 2. Concentrations of Selected TAL Metals in Groundwater

Sample Intake (feet bgs)	Ag	Al	As	Ba	Be	Cd	Cr	Mn	Ni	Pb	Sb	V	Zn	OC
µg/L														
Site M-2 – MW13														
10	3.95	ND	2.21	82.8	ND	1.07	0.87	155	3.07	4.84	5.58	1.80	31.2	—
18	4.24	ND	2.57	70.7	ND	1.13	0.62	149	ND	4.09	ND	1.42	15.3	—
Site 108 – MW04														
6.75	ND	1160	4.94	28.8	ND	1.09	7.82	14.6	4.04	8.76	ND	5.13	49.6	—
7.5	ND	3630	8.77	39.4	ND	1.35	23.0	39.5	7.64	26.0	5.48	13.0	118	—
Site 296 – MW06														
3.7	9.71	ND	4.38	250	ND	2.65	ND	2220	1.43	7.96	ND	1.80	ND	—
12.25	7.56	ND	2.69	202	ND	2.12	ND	1940	ND	7.83	ND	2.11	ND	—
NJDEP GWQS	40	200	3	6000	1	4	70	50	100	5	6	—	2000	—

ND: not detected. Concentrations in **bold** type exceed the GWQS.

It appears a correlation exists between the concentrations of arsenic and lead in groundwater, i.e., the concentrations of arsenic and lead are directly proportional to each other. To determine if the concentrations of arsenic and lead are related to each other, a geochemical association was conducted. To illustrate this, the concentration of arsenic in each groundwater sample was plotted against the corresponding concentration of lead to generate an “Arsenic-Lead” scatter plot (**Figure 1**).

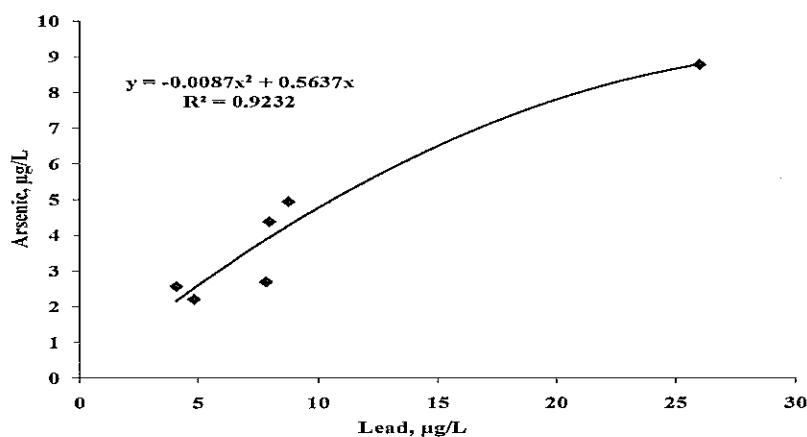


Figure 1. Scatter plot of arsenic and lead concentrations detected in groundwater.

As this figure shows, the concentration of arsenic increases with increases in the lead concentration. A second-order trendline was fitted to the data. The goodness of fit result of $R^2 = 0.9232$ demonstrates a strong relationship between arsenic and lead given the limited data set.

Thus, it appears that arsenic and lead co-exist as naturally occurring TAL metals, i.e. both metals are non-site related COCs.

Comparison of Arsenic and Lead in Soil and Groundwater

A comparison of TAL metals concentrations in soil and groundwater was completed and no relationship or correlation could be established. In other words, arsenic and lead concentrations in soil are not proportional or inversely proportional to the concentrations of TAL metals identified in groundwater.

Similar to DPW's investigation, Princeton Geoscience, Inc. (PGI) performed a soil and groundwater remedial investigation at a site in the New Jersey Coastal Plain (<http://www.princetongeoscience.com/geonew.html>). PGI identified natural arsenic concentrations in soil at concentrations up to 100 mg/kg. The elevated metals concentrations in collected groundwater samples resulted mainly from turbidity introduced into the monitoring wells during purging. Low-flow purging and monitoring well redevelopment did not eliminate turbidity in the groundwater samples.

After employing a different approach/technique, PGI compared groundwater concentrations of the trace metals to trace metal concentrations in soil NJDEP acknowledged were of naturally-occurring and identified a correlation for each of the trace metals in question. PGI states that "no remediation has been required to address this issue and Princeton Geoscience has indicated an intention not to include metals as groundwater contaminants in the Classification Exception Area information to be submitted for this site."

Summary

- Arsenic was detected in groundwater at concentrations exceeding the GWQS of 3 µg/L in three of six samples (50%).
- Lead was detected in groundwater at concentrations exceeding the GWQS of 5 µg/L in four of six samples (67%).
- The greatest concentrations of arsenic and lead in groundwater were detected adjacent to the glauconite-rich soil layer at monitoring well 108MW04 (7.5 feet bgs).
- Similarly, the greatest concentrations of arsenic (15 mg/kg) and lead (16 mg/kg) in soil were detected in a sample collected from the glauconitic-rich soil layer proximate to monitoring well 108MW04 (15 mg/kg at 7.0-8.0 feet bgs). Lead was also detected at the same concentration in the shallower soil sample depth (6.5-7.0 feet bgs).
- The greatest concentrations of arsenic in soil were identified at Site 108 where underground storage tanks used to store petroleum products were removed. Arsenic is not associated with refined petroleum products.
- A comparison of TAL metals concentrations in soil and groundwater was completed and no relationship or correlation could be established.

Conclusions

- Given that arsenic was detected at concentrations exceeding the GWQS, this confirms DPW's conclusion in Versar's *Remedial Investigation Report* (2004) that "... arsenic is likely attributable to the native soil characteristics or a non-point source distributed throughout the subsurface soils at Site 108."
- Based on a general knowledge of site historical operations and geology of the Fort Monmouth area, the presence of arsenic and lead co-exist as naturally-occurring TAL metals that are unrelated to anthropogenic activities at the three sites that were investigated.

- It appears arsenic and lead co-exist as naturally occurring TAL metals, i.e. neither metal has been detected and confirmed or documented from a source at any site.
- It appears that the source of arsenic in groundwater is due to natural conditions rather than man-made/anthropogenic sources. Vowinkel et al. (2001) reported that arsenic concentrations greater than 50 µg/L are typically associated with known contaminated sites. The greatest concentration of arsenic identified in this study is 8.77 µg/L.

Recommendations

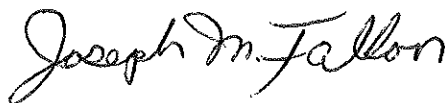
- To determine if suspended particles (turbidity) is proportional to detectable concentrations of metals in aqueous samples, filtered and unfiltered samples should be collected and analyzed for TAL metals by a NJ certified laboratory. Filtered samples should provide more consistent analytical results and be more representative of the water quality moving within a water-bearing zone.
- Samples of the glauconite should be collected and chemically analyzed by a certified laboratory for TAL metals to determine if arsenic and other TAL metals are present in its chemical makeup (source material).

References

- Dooley, J.H., 2001, *Baseline Concentrations of Arsenic, Beryllium, and Associated Elements in Glauconite and Glauconite Soils in the New Jersey Coastal Plain*, New Jersey Geological Survey, Trenton, 238 pp.
- Jablonski, L.A., 1968, *Groundwater Resources of Monmouth County, New Jersey*. U.S. Geological Survey Special Report 23. Washington, DC.
- Minard, J.P., 1969, *Geology of Sandy Hook Quadrangle in Monmouth County, New Jersey*. U.S. Government Printing Office, Washington, DC.
- NJDEP, 2005, *Field Sampling Procedures Manual*, Trenton, NJ
- Rutgers University, 2002, *Greensand and Greensand Soils of New Jersey – A Review*, Department of Ecology, Evolution and Natural Resources.
- U.S. Army Base Realignment and Closure, 2007, *Environmental Condition of Property Report*, Fort Monmouth.
- U.S. Geological Survey, 1984, *Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States*, Professional Paper No. 1270.
- Versar, Inc., 2004, *Remedial Investigation Report*.
- Vowinkel, E.F., Grosz, A.E., Barringer, J.L., Szabo, Z., Stackelberg, P.E., Hopple, J.A., Grossman, J.N., Murphy, E.A., Serfes, M. and Spayd, S., 2001, *Distribution of Arsenic in the Environment in New Jersey*, U.S. Geological Survey Open-File Report 01-142, 4 p.

If you have any questions or require additional information, please contact John H. Montgomery, Senior Hydrogeologist, at 732-532-7979 or email: john.h.montgomery@us.army.mil.

Sincerely,



Joseph M. Fallon, CHMM
Chief, Environmental Division

c: file
Attachments

Attachment 1

Base-Wide Glauconitic Soil Sampling Plan Approval Letter from NJDEP



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
SITE REMEDIATION, PUBLICLY FUNDED REMEDIATION ELEMENT
P.O. BOX 413
TRENTON, NEW JERSEY 08625-0413

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

October 29, 2010

Mr. Joseph Fallon, CHMM
Directorate of Public Works
ATTN: IMNE-MON-PWE
167 Riverside Ave.
Fort Monmouth, NJ 07703

RE: Base-Wide Glauconitic Soil Sampling Plan
Fort Monmouth, NJ

Dear Mr. Fallon:

The NJDEP Site Remediation Program (SRP) has received and reviewed the revised Base-Wide Glauconitic Soil Sampling Plan dated October 13, 2010. The stated intent of the Base-Wide Glauconitic Soil Sampling Plan is to "confirm and document that select TAL metals detected in groundwater on the Main Post are naturally associated with glauconitic soils".

As you know, SRP reviewed prior versions of the sampling plan and provided comments, primarily about the compositing of soil samples. We have also discussed the sampling plan with Chuck Appleby and John Montgomery of your staff. SRP believes that the proposed soil and ground water sampling procedures and methodologies are now technically correct. As such, we are willing to take the results of the proposed sampling into consideration. However, that is not an assurance that we will concur with the conclusions that Fort Monmouth draws from the investigation, or that the results of the proposed glauconitic soil sampling will be a significant factor in any remedial decisions.

You or your staff may contact me at 609-633-0766 with any questions on the enclosed comments, or any other site remediation matters at Fort Monmouth.

Sincerely,

Larry Quinn, P.E., Site Manager

Bureau of Investigation, Design and Construction

Attachment 2

Well Logs for 108-MW04, 296-MW04, M2-MW13, M2-MW18, and M2-MW24



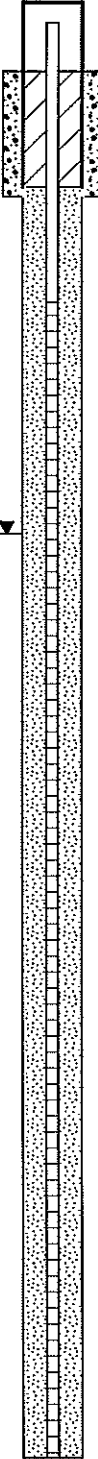
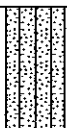
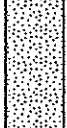
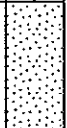
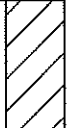
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FORT MONMOUTH
SELF-M-PW-EV

LOG OF BORING 108MW04

U.S. ARMY
SELF-M-PW-EV
JOSEPH FALLON
SITE 108 (FTMM-57)
GROUNDWATER INVESTIGATION

NJDEP Permit # : 29-33762
NJDEP Case # : 93-1-12-1939-29
Start Date : 8/16/1995
Completion Date : 8/16/1995

Northing : N 541733.142
Easting : E 623706.198
Logged By : Shore Drilling Inc.
Driller : Gary Parent

Depth in Feet	Well: MW04 Elevation: 12.77	DESCRIPTION	USCS	GRAPHIC	Samples	Blows/ft.	Well Construction Information
0		Brown coarse-fine SANDS, gravel, dry	SM		1	10	Well Construction Hole Diameter : 12 inch Drill Method : Hollow Stem Auger Sampling Method : Split Spoon Well Casing Material : PVC Diameter : 4 inch Joints : Threaded Length : 5 feet
1							
2		Green brown SANDS, clay, tree roots, moist	CL		2	4	Well Screen Material : PVC Diameter : 4 inch Joints : Threaded Opening : 0.020 inch Length : 10 feet Sand Pack Annulus Seal : #2 Morie Sand Bentonite Slurry
3							
4							Stick up: 3 feet Water level: 4 feet
5		Brown coarse-fine SANDS, coarse-fine gravel, clayey, wet, less clayey with depth	SP		3	24	
6							
7					4	16	
8		Brown coarse-fine SANDS, fine gravel, wet, mottled gray, clay at 11.5 feet	SW		5	4	
9							
10		Green-black CLAY, fine sand, wet glauconite	CL		6	7	
11							
12							



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FORT MONMOUTH
SELF-M-PW-EV

LOG OF BORING 296MW04

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SELF-M-PW-EV
JOSEPH FALLON
SITE 296 (FTMM-54)
GROUNDWATER INVESTIGATION

NJDEP Permit # : 29-33989
NJDEP Case # : 93-11-2-1200-13
Start Date : 9/12/1995
Completion Date : 9/12/1995

Northing : N 540628.952
Easting : E 618337.256
Logged By : Shore Drilling Inc
Driller : Gary Parent

Depth
in
Feet

Well: MW04
Elevation: 5.42

DESCRIPTION

USCS

GRAPHIC

Samples

Blow Count

Well Construction
Information

Topsoil, roots, organic

SM

Black-brown clayey SILT; organic, wet at 1.3 feet

OL

Green glauconite

CL

Well Construction

1
Hole Diameter : 12 inch
Drill Method : Hollow Stem Auger
Sampling Method : Split Spoon

1/12 Well Casing
Material : PVC
Diameter : 4 inch
Joints : Threaded
Length : 0.5 feet

2 Well Screen
Material : PVC
Diameter : 4 inch
Joints : Threaded
Opening : 0.020 inch
Length : 9.5 feet

2 Sand Pack
Annulus Seal : #2 Morie Sand
Genonite

1
Stick up: 3 feet
Water level: 0.5 feet



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FORT MONMOUTH
SELFM-PW-EV

LOG OF BORING M2MW13

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U.S. Army
SELFM-PW-EV
JOSEPH FALLON
M2 LANDFILL (FTMM-02)
GROUNDWATER INVESTIGATION

NJDEP Permit # : 29-42771
NJDEP Case # : -
Start Date : 5/8/2000
Completion Date : 5/8/2000

Northing : N 538121.151
Easting : E 617127.234
Logged By : CT&E Environmental
Driller : William Petley

Depth
in
Feet

Well: MW13
Elevation: 16.08

DESCRIPTION

USCS

GRAPHIC

Samples

Blow Count

Well Construction Information

FILL

Well Construction

Hole Diameter : 10 inch
Drill Method : Hollow Stem Auger
Sampling Method : Split Spoon

Well Casing

Material : PVC
Diameter : 4 inch
Joints : Threaded
Length : 5 feet

Well Screen

Material : PVC
Diameter : 4 inch
Joints : Threaded
Opening : 0.010 inch
Length : 15 feet

Sand Pack : #1 Morie Sand
Annulus Seal : Bentonite

Stick up: 2.5 feet
Water level: 7 feet

*Boring log derived from Monitoring Well Record

Organic SILT

OL

Glauconite

CL



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FORT MONMOUTH
SELF-M-PW-EV**

LOG OF BORING M2MW18

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U.S. Army
SELF-M-PW-EV
JOSEPH FALLON
M2 LANDFILL (FTMM-02)
GROUNDWATER INVESTIGATION

NJDEP Permit # : 29-42776
NJDEP Case # : -
Start Date : 5/2/2000
Completion Date : 5/2/2000

Northing : N 537753.868
Easting : E 616581.974
Logged By : CT&E Environmental
Driller : William Petley

Depth
in
Feet

Well: MW18
Elevation: 11.67

DESCRIPTION

USCS

GRAPHIC

Samples

Blow Count

Well Construction
Information

FILL

Well Construction

Hole Diameter : 10 inch
Drill Method : Hollow Stem Auger
Sampling Method : Split Spoon

Well Casing

Material : PVC
Diameter : 4 inch
Joints : Threaded
Length : 5 feet

Well Screen

Material : PVC
Diameter : 4 inch
Joints : Threaded
Opening : 0.010 inch
Length : 15 feet

Sand Pack : # 1 Morie Sand
Annulus Seal : Bentonite

Water level: 7 feet

*Boring log derived from Monitoring Well
Record

**Casing height not indicated on Monitoring
Well Record

Organic SILT

OL

SILT

ML

Glauconite

CL



U.S. ARMY
FORT MONMOUTH
SELFM-PW-EV

LOG OF BORING M2MW24

(Page 1 of 1)

U.S. Army
SELFM-PW-EV
JOSEPH FALLON
M2 LANDFILL (FTMM-02)
GROUNDWATER INVESTIGATION

NJDEP Permit # : 29-42772
NJDEP Case # : -
Start Date : 5/4/2000
Completion Date : 5/4/2000

Northing : N 537805.303
Easting : E 616599.277
Logged By : CT&E Environmental
Driller : William Petley

Depth
in
Feet

Well: MW24
Elevation: 16.78

DESCRIPTION

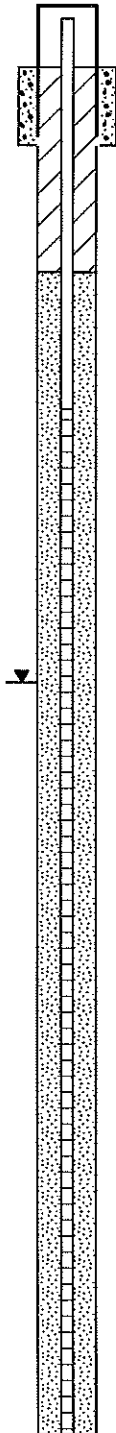
USCS

GRAPHIC

Samples

Blow Count

Well Construction
Information



FILL

Well Construction

Hole Diameter : 10 inch
Drill Method : Hollow Stem Auger
Sampling Method : Split Spoon

Well Casing

Material : PVC
Diameter : 4 inch
Joints : Threaded
Length : 5 feet

Well Screen

Material : PVC
Diameter : 4 inch
Joints : Threaded
Opening : 0.010 inch
Length : 15 feet

Sand Pack : # 1 Morie Sand
Annulus Seal : Bentonite

Stick up: 2.5 feet
Water level: 9 feet

*Boring log derived from Monitoring Well
Record

Organic SILT

OL

Silty SAND

SM

Glauconite

CL

Attachment 3

Soil Boring Logs and Glauconitic Sample Location Maps



U.S. ARMY
FORT MONMOUTH
SELF-M-PW-EV

LOG OF BORING 108 B1

(Page 1 of 1)

US ARMY
FORT MONMOUTH
BRAC-IRP
SITE 108 (FTMM-57)
JOHN H. MONTGOMERY

DATE STARTED : 10/26/2010
DATE COMPLETED : 10/26/2010
HOLE DIAMETER : 1.5 Inches
DRILLING METHOD : Geoprobe
SAMPLING METHOD : Macro-Core

GEOLOGIST : John Montgomery
OPERATOR : George Boyce
NJDEP LICENSE # : JD22654
NORTHING : 541730.471
EASTING : 623712.502

DEPTH IN FEET	SAMPLE ID	SAMPLES	PID	GRAPHIC	USCS DESCRIPTION	NOTES
0					Miscellaneous fill, bricks, concrete, construction debris, FB	
1						
2						
3						
4					Grayish-green (glaucous), inorganic medium stiff plastic clay, iron molting, CL	
5					Light-brown, stiff clay, CL	
6						
7	(6.5-7.0')	1	0		Grayish-green (glaucous), clayey medium-fine sand, wet, trace semi-rounded coarse gravel, SC	Collect sample 6.5-7.0'
8	(7.0-8.0')	2	0		Light brown to tan, fine-very fine sand, trace coarse sand, glauconite-rich, SW	Collect sample 7.0-8.0'
9					Light brown to tan, fine-very fine sand, trace coarse sand, with some glauconite sand, wet, SW	
10						



U.S. ARMY
FORT MONMOUTH
SELF-M-PW-EV

LOG OF BORING M2 B3

(Page 1 of 1)

US ARMY
FORT MONMOUTH
BRAC-IRP
M2 LANDFILL (FTMM-02)
JOHN H. MONTGOMERY

DATE STARTED : 11/10/2010
DATE COMPLETED : 11/10/2010
HOLE DIAMETER : 1.5 Inches
DRILLING METHOD : Geoprobe
SAMPLING METHOD : Macro-Core

GEOLOGIST : John Montgomery
OPERATOR : George Boyce
NJDEP LICENSE # : JD22654
NORTHING : 538116.015
EASTING : 617121.260

DEPTH IN FEET	SAMPLE ID	SAMPLES	PID	GRAPHIC	USCS DESCRIPTION	NOTES
0					Dark brown, fine to very fine sand, with miscellaneous fill (bricks, glass, concrete, etc.) wet at 6.5 feet, FB	
1						
2						
3						
4						
5						
6						
7						
8					Dark brown, very fine sand, some (+) silt, wet. Trace organics, OL	
9						
10	(8.0-12.0')	1	0			Collect sample 8.0-12.0'
11						
12						
13						
14						
15						
16					Dark green (glaucous) medium to very fine sand, some (+) silt and clay, wet, ML-CL	
17						
18	(16.0-20.0')	2	0			Collect sample 16.0-20.0'
19						
20						



U.S. ARMY
FORT MONMOUTH
SELF-M-PW-EV

LOG OF BORING 296 B1

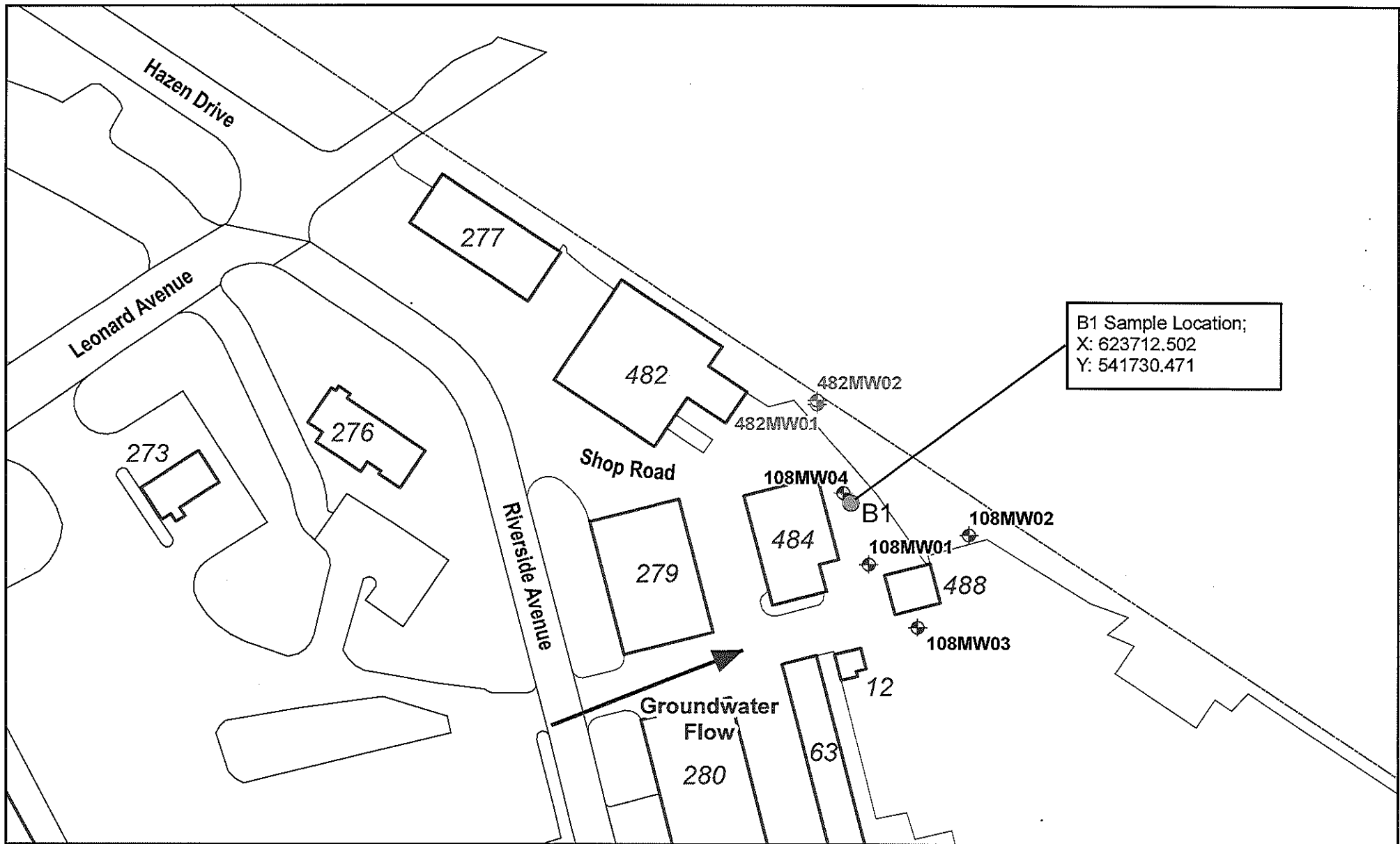
(Page 1 of 1)

US ARMY
FORT MONMOUTH
BRAC-IRP
SITE 296 (FTMM-54)
JOHN H. MONTGOMERY

DATE STARTED : 11/1/2010
DATE COMPLETED : 11/1/2010
HOLE DIAMETER : 1.5 Inches
DRILLING METHOD : Geoprobe
SAMPLING METHOD : Macro-Core

GEOLOGIST : John Montgomery
OPERATOR : George Boyce
NJDEP LICENSE # : JD22654
NORTHING : 540518.487
EASTING : 618397.020

DEPTH IN FEET	SAMPLE ID	SAMPLES	PID	GRAPHIC	USCS DESCRIPTION	NOTES
0					Greenish-brown to dark brownish-yellow fine-very fine sand, some (+) silt, SM	
1						
2						
3						
4	(3.5-4.0')	1	0		Grayish-black fine-very fine sand, trace (-) gravel, some (+) silt, GM	Collect sample 3.5-4.0'
5						
6						
7						
8					Grayish-black clayey peat, wet. Organic-like odor, PT	
9						
10						
11						
12	(12.0-12.5')	2	0		Greenish-gray to olive green (glauconitic) sand, some (-) clay, wet, SM	Collect sample 12.0-12.5'
13						
14						



Glauconite Sample Location FTMM-57 Main Post Fort Monmouth, New Jersey

Map Created by:
Fort Monmouth Installation GIO, Environmental Division FOUO
Fort Monmouth, New Jersey
Date: November 16, 2010

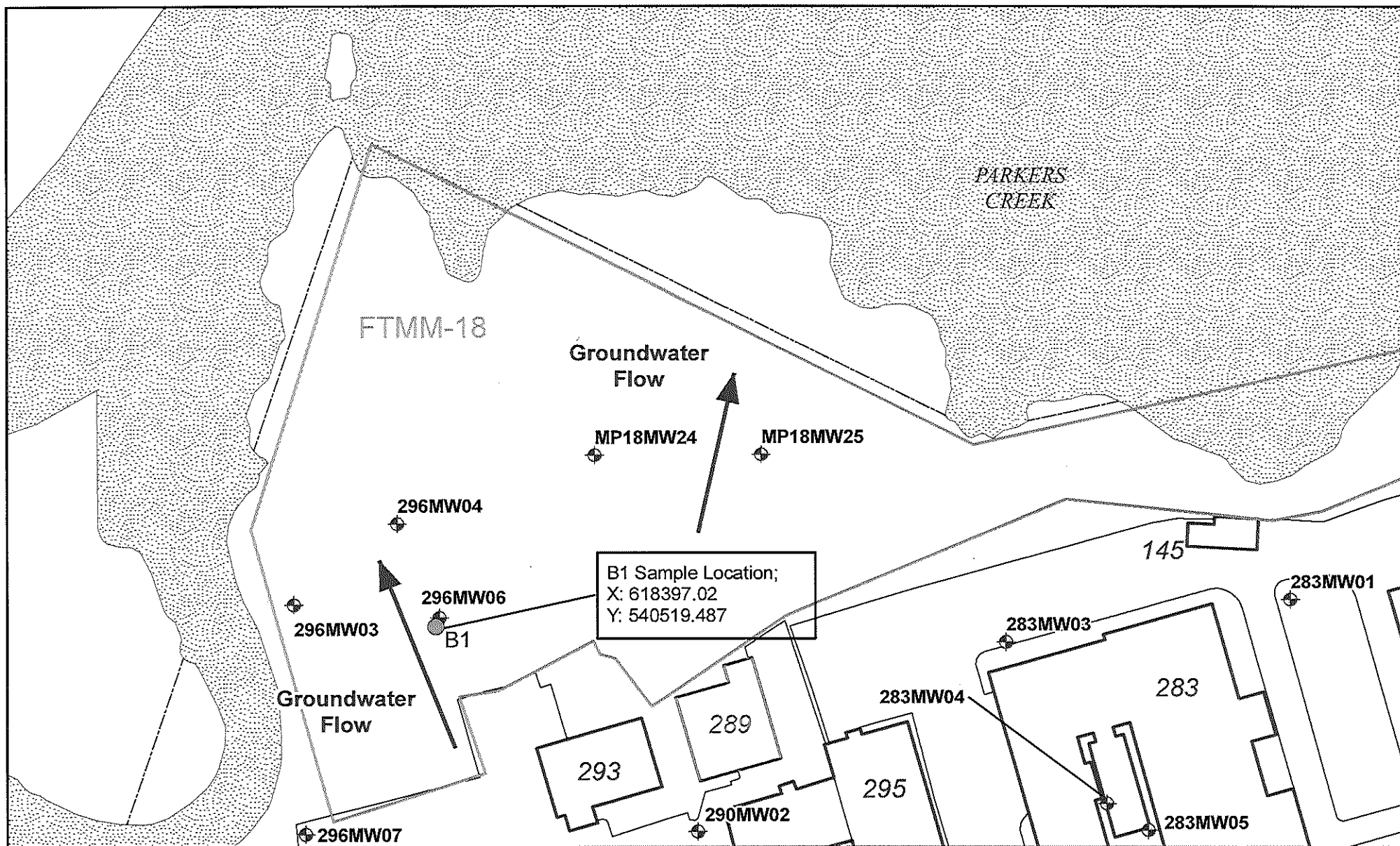


0 50 100 200 Feet

NAD 83, NJ State Plane Feet

Legend

- | | |
|-----------------------------|----------------------|
| Sample Location | Roadway & Parking |
| Monitoring Well - Abandoned | Existing Structure |
| Monitoring Well - Active | Demolished Structure |
| | Post Boundary |



Glauconite Sample Location FTMM-18 Landfill, Main Post Fort Monmouth, New Jersey

Map Created by:
Fort Monmouth Installation GIO, Environmental Division FOUO
Fort Monmouth, New Jersey
Date: November 16, 2010

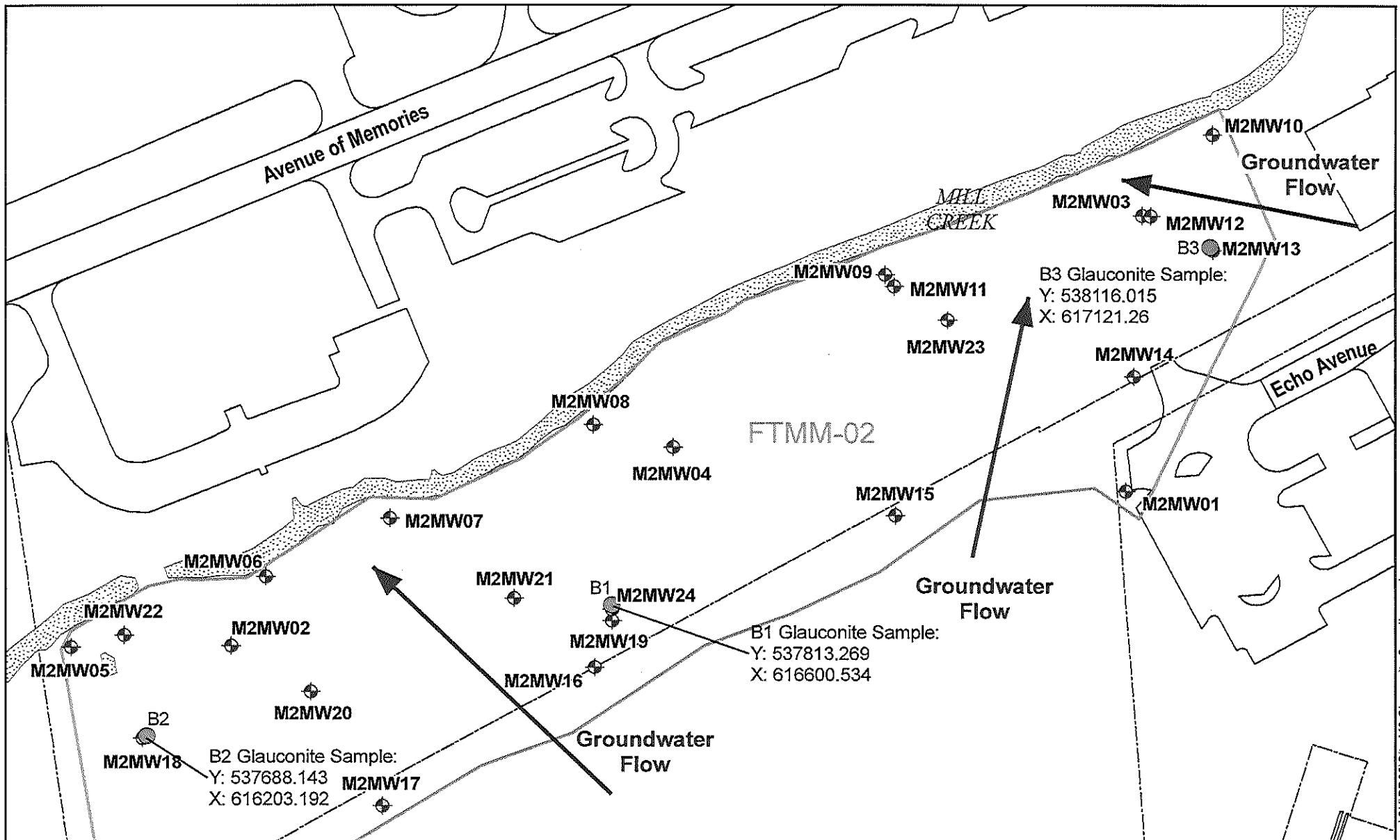


0 50 100 200 Feet

NAD 83, NJ State Plane Feet

Legend

- Sample Location
- Monitoring Well
- Existing Structure
- Demolished Structure
- Roadway & Parking
- Landfill Area
- Water Body
- Post Boundary



Attachment 4

Low-Flow Sampling Standard Operating Procedure

STANDARD OPERATING PROCEDURE

SOP No.: SAM-0223

Revision No.: 5

Date Revised: 10/13/10

Page 1 of 15

CATEGORY: Sample Handling

TITLE: Low Flow Monitor Well Sampling

1 PURPOSE:

- 1.1 To document current procedures for low flow monitoring, well purging and sampling. The procedure applies to monitoring wells that have an inner casing with a diameter of 2.0 inches or greater, and maximum screened intervals of ten feet unless multiple intervals are sampled. This procedure is appropriate for the collection of ground water samples that will be analyzed for volatile and semi-volatile organic compounds, pesticides, PCBs, metals, and microbiological contaminants in association with all EPA programs.

2 RESPONSIBILITY:

- 2.1 Designated field samplers who have been properly trained and instructed in low flow methods and in the NJDEP field sampling procedures and protocols.

3 SAMPLE COLLECTION, PRESERVATION AND HANDLING:

- 3.1 For sample collection, preservation and handling please refer to SOP No. SAM-0200.

4 REFERENCES:

- 4.1 Field Sampling Procedures Manual, August 2005. New Jersey Department of Environmental Protection.
- 4.2 USEPA Region II Ground Water Sampling Procedure Low Stress (Low Flow) Purging and Sampling, www.epa.gov/Region2/desa/hsw/lowflow.txt.
- 4.3 "Low Flow (Minimal Drawdown) Ground Water Sampling Procedures" by Robert W. Puls and Michael J. Barcelona. EPA Ground Water Issue. EPA/540/S-59/504.
- 4.4 "Low Flow/Low Volume Purging and Sampling" Standard Operating Procedure, City of San Diego, Environmental Services Department, Refuse Disposal Division, February 25, 2004.
- 4.5 Laboratory SOPs: SAM-0200, SAM-0202 and OQC-0302.

5 SUMMARY:

- 5.1 The purpose of the low flow purging and sampling is to collect ground water samples from monitoring wells that are representative of ambient ground water conditions in

Prepared By: <u>Walter Fush</u>	Date: <u>10/13/10</u>
Technical Supervisor: <u>Deen Talar</u>	Date: <u>10/13/10</u>
QA/QC Supervisor: <u>Deen Talar</u>	Date: <u>10/13/10</u>

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the aquifer. This is accomplished by setting the intake velocity of the sampling pump to a flow rate that limits drawdown inside the well.

5.2 Low flow purging and sampling has three primary benefits.

5.2.1 First, it minimizes the disturbance of sediment in the bottom of the well, thereby producing a sample with low turbidity (low concentration of suspended particles).

5.2.2 Second, this procedure minimizes aeration of the ground water during sample collection, which improves the sample quality for volatile organic analysis.

5.2.3 Third, the amount of ground water purged from a well is usually reduced as compared to conventional ground water purging and sampling methods.

5.3 Since the method allows for the collection of ground water samples with low turbidity, it was originally used for collecting samples for inorganic analysis. The method typically allows the collection of samples for total metals analysis and eliminates the need to filter the samples for dissolved metals analysis.

5.4 The method also minimizes aeration of the samples. It can be used to collect samples for analysis of volatile and semi-volatile organic compounds, provided that the appropriate pumps are used in sample collection.

5.5 Advantages of low flow purging and sampling are:

5.5.1 Groundwater samples tend to be more representative of actual aquifer conditions with respect to mobile contaminants and turbidity.

5.5.2 It causes minimal disturbance of the formation adjacent to the screened aquifer.

5.5.3 It is generally less prone to sampling variability compared to other ground water sampling techniques (bailers).

5.5.4 Smaller purge volumes and associated disposal expense.

5.5.5 Increased sample consistency from dedicated systems and reproducibility of data due to reduced operator variability.

5.6 Disadvantages of low flow purging and sampling are:

5.6.1 Misconceptions regarding reduced purging and sampling time.

5.6.2 Sampling from non-dedicated systems requires greater set-up time.

5.6.3 Sampling from dedicated systems requires higher initial capital expenses.

5.6.4 Increased technical complexity.

5.6.5 Increased training needs for sampling personnel.

5.6.6 Not a first round sampling option.

5.6.7 Not recommended for wells with long screen intervals unless multiple samples are collected.

6 DEFINITIONS:

6.1 LFPS = Low Flow Purging and Sampling.

6.2 PPE = Personal Protective Equipment.

6.3 NIST = National Institute of Standards and Technology.

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7 SAFETY:

- 7.1 For safety, please refer to CTSC Fort Monmouth, NJ Health and Safety Plan (HASP).
- 7.2 Preparation: It should be noted that before going out into the field, certain preparations should be made. This includes the selection of PPE, safety plans, proper bottle acquisition for the analytes being tested, site entry, map information and equipment.
- 7.3 Avoid skin contact and ingestion of purge water.
- 7.4 Avoid breathing constituents venting from the well.

8 EQUIPMENT AND MATERIALS:

- 8.1 YSI 600XL Sonde (or equivalent) with temperature, pH, Specific conductivity and DO probes or other probes as needed.
- 8.2 YSI 6820 Sonde (or equivalent) if oxidation reduction potential (ORP) is needed.
- 8.3 YSI 650 MDS Data Logger (or equivalent) with appropriate cables.
- 8.4 HNU photo ionization detector (PID).
- 8.5 HACH turbidity meter (or equivalent).
- 8.6 Peristaltic well pumps.
- 8.7 Pump heads and power cables.
- 8.8 Water level meter, accurate to 0.01 foot.
- 8.9 Oil/water interface probe.
- 8.10 Submersible well pumps.
- 8.11 Various batteries.
- 8.12 Buckets.
- 8.13 Polyethylene sheeting.
- 8.14 Miscellaneous tools, i.e. screwdriver and well wrench.
- 8.15 Miscellaneous equipment supplies and tools.
- 8.16 Deionized water sprayer.
- 8.17 Paper towels and scrub brushes.
- 8.18 Graduated cylinder.
- 8.19 Gas generator and fuel supply if needed.
- 8.20 Silicone thick wall (lab grade) tubing ¼ inch diameter.
- 8.21 Polyethylene (food grade) tubing ¼ inch diameter. Sufficient tubing must be available so that each well has dedicated tubing.
- 8.22 Stop watch.
- 8.23 Sample bottles, preservation supplies, sample labels and chain of custody forms.
- 8.24 Coolers (for sample transport).
- 8.25 Approved Quality Assurance Project Plan.
- 8.26 Well keys and map of well locations.
- 8.27 Field notebook, ground water sampling logs and calculator.

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9 STANDARDS/REAGENTS:

- 9.1 Buffer solutions, calibration gases, decontamination materials and acid for preservation.
 - 9.1.1 Buffer solutions:
 - 9.1.1.1 7.00 standard buffer solution.
 - 9.1.1.2 10.00 standard buffer solution.
 - 9.1.1.3 4.00 standard buffer solution.
 - 9.1.2 Oxidation Reduction Calibration solution.
 - 9.1.3 Appropriate NTU Turbidity solutions for calibration.
 - 9.1.4 Distilled/deionized water.
 - 9.1.5 Alconox.
 - 9.1.6 10 % Nitric acid rinse (trace metal or higher grade HNO_3 diluted with distilled/deionized ASTM Type II water).
 - 9.1.7 Acetone, pesticide grade.
 - 9.1.8 Pure nitrogen for blow out.
 - 9.1.9 Acids/materials used in preserving samples:
 - 9.1.9.1 Nitric acid 69.0-70.0%.
 - 9.1.9.2 Sulfuric acid 50% (w/w) solution.
 - 9.1.9.3 Hydrochloric acid (trace metal grade).
 - 9.1.10 Ice for keeping samples at less than 4 degrees Celsius.

10 QUALITY CONTROL:

- 10.1 Quality control samples must be collected to verify that sample collection and handling procedures were performed adequately and that they have not compromised the quality of the ground water samples.
- 10.2 Sample containers: Before sample collection begins, consideration must be given as to what type of container will be used to transport and store samples. The laboratory provides containers based upon requested methodologies. Selection is based on the matrix, potential contaminants, analytical methods and the laboratories internal QA/QC requirements. They should be selected upon review of the following:
 - 10.2.1 Reactivity of the container material with the sample. Glass is recommended for hazardous material samples since it is chemically inert to most substances. Plastic may be used when analytes of interest or sample characteristics dictate the use of instead.
 - 10.2.2 Volume of the container. The analytical method and the matrix of the sample dictate the volume of sample needed. The laboratory will supply bottles that allow for sufficient volumes of sample to be collected.
 - 10.2.3 Color of container. Whenever possible, amber glass is used to prevent photo degradation. If not available, samples should be kept protected from light. One exception is the 40 mL clear glass VOA vials used for volatile organics.

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- 10.2.4 Container closures. All containers utilized have a leak proof seal and are constructed out of material that is inert with respect to sampled materials. The closure may also be separated by a closure liner that is inert to the sample material.
- 10.2.5 Decontamination of containers and chain of custody. Sample containers are laboratory cleaned or bought precleaned from the vendor. Bottles being shipped are accompanied by a chain of custody in a cooler with a custody seal. Custody must accompany the containers to the field, during collection, back to the laboratory and during analysis. This helps to assure that no tampering or contamination occurs from outside sources.
- 10.2.6 Storage and transport. Care is taken to avoid contamination. Clean transport and storage environments are observed. Sample or bottle storage is never near solvents, gasoline, or other equipment that is a potential source of contamination. The samples are secured in coolers for transport with chain of custody forms inside the coolers or in the hands of authorized personnel.
- 10.2.6.1 . Additionally, a temperature blank is included in each cooler to measure the temperature of the samples on ice in the coolers (ideally a constant ≤ 4 degrees Celsius).
- 10.2.7 Tubing decontamination. Food grade polyethylene tubing is used and discarded after each use. Avoid pump and tubing contact with ground surfaces. All tubing is rinsed and wiped with distilled/deionized water to remove any possible residual materials on it before entering the well.
- 10.2.8 Pump decontamination. Since a peristaltic pump never contacts the water, it only needs to be kept in clean, running order. Silicone tubing used in the pump head needs to be replaced each time the pump is used. For a submersible pump, the following daily decontamination and in between well decontamination procedures should be followed:
- 10.2.8.1 Daily decontamination:
- 10.2.8.1.1 Pre-rinse: Operate the pump in a deep basin containing 8-10 gallons of potable water for 5 minutes and flush the other equipment with potable water for 5 minutes.
 - 10.2.8.1.2 Wash: Operate the pump in another deep basin containing 8-10 gallons of a non-phosphate detergent solution such as Alconox for 5 minutes and flush the other equipment with fresh detergent solution for 5 minutes.
 - 10.2.8.1.3 Rinse: Operate the pump in a deep basin of potable water for another 5 minutes and flush the other equipment for 5 minutes with potable water.
 - 10.2.8.1.4 Disassemble pump (refer to the pump directions).

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-
- 10.2.8.1.5 Wash the parts of the pump: Place the disassembled parts of the pump into a basin containing another 8-10 gallons of non-phosphate detergent. Scrub all parts with a test tube brush.
 - 10.2.8.1.6 Rinse the pump parts with potable water.
 - 10.2.8.1.7 Rinse the following parts with distilled/deionized water: Inlet, screen, shaft, suction interconnector, motor lead assembly, and the stator housing.
 - 10.2.8.1.8 Place the impeller assembly in a large glass beaker and rinse with 1% nitric acid.
 - 10.2.8.1.9 Rinse the impeller assembly with potable water.
 - 10.2.8.1.10 Rinse the impeller assembly with isopropanol.
 - 10.2.8.1.11 Finally, rinse the impeller assembly with distilled/deionized water.
 - 10.2.8.2 Between well decontamination:
 - 10.2.8.2.1 Pre-rinse: Operate the pump in a deep basin containing 8-10 gallons of potable water for 5 minutes and flush the other equipment with potable water for 5 minutes.
 - 10.2.8.2.2 Wash: Operate the pump in another deep basin containing 8-10 gallons of a non-phosphate detergent solution such as Alconox for 5 minutes and flush the other equipment with fresh detergent solution for 5 minutes.
 - 10.2.8.2.3 Rinse: Operate the pump in a deep basin of potable water for another 5 minutes and flush the other equipment for 5 minutes with potable water.
 - 10.2.8.2.4 Final rinse: Operate the pump in a deep basin of distilled/deionized water to pump out 1-2 gallons of this water.
 - 10.3 Disposal of development, purge, pump test, and decon waters: To determine whether wastewaters are contaminated, field instrument readings and previous analytical data are used for characterization. Water that is not considered contaminated can be re-applied directly to the ground surface and permitted to percolate back into the groundwater system. Care should be taken to avoid nuisance situations where discharge may cause undue concern. When water is considered contaminated, the water generated can be re-applied back only if the following conditions are met: Ground water is not permitted to migrate off site. No potential for contaminating a previously uncontaminated aquifer. Discharge will not cause an increase to ground surface soil contamination. If these conditions cannot be met, then water is collected and secured in a single locale. It may be re-applied to the ground surface if the analytical results indicate the above requirements have been met. If not, arrangements

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are made for proper disposal. Please refer to the NJDEP Field Sampling Procedures Manual, Chapter 2A, pages 24-25.

10.4 QA/QC samples: These samples are intended to provide control over the collection of measurements and subsequent validation, review and interpretation of analytical data. A trip blank is used for volatile organics and its purpose is to measure possible cross contamination of samples in transit and at the site. It is never opened and travels to the site or sites with empty sample bottles and back with the samples. The trip blank may also indicate poor cleaning. Likewise, a field blank is used to determine a control on the equipment handling, preparation, storage and shipment. It travels with the samples and is a representative of shipment effects on sample quality. By being opened in the field, transferred over a cleaned sampling device, the field blank is indicative of ambient and equipment conditions that may affect the quality of associated samples. It also serves as an additional check on the possible sources of contamination. Blank water is demonstrated analyte free and is from the same common source and physical locale in the laboratory.

10.4.1 QA/QC blank requirements:

10.4.1.1 Field blanks: They are preserved and analyzed for all of the same parameters as the samples collected that day. They may be required in order to detect cross contamination from ambient air during a potable sampling if known sources are within proximity or monitoring equipment indicates their presence as background. These blanks should be prepared during the middle to end of a sampling event by filling sample containers with water from like containers poured over the decontaminated equipment. Field blanks must be taken once a day during sampling.

10.4.1.2 Equipment blanks: They are preserved and analyzed for all of the same parameters as the samples collected that day. They may be required in order to detect cross contamination from ambient air during a potable sampling if known sources are within proximity or monitoring equipment indicates their presence as background. These blanks should be prepared at the beginning of the sampling event by filling sample containers with water from like containers poured over the decontaminated equipment. Equipment blanks are not necessary if the equipment is dedicated to the well.

10.4.1.3 Trip blanks: They consist of a set of bottles each filled at the lab with analyte free water. They accompany the bottles both to and from each site. They are never opened in the field. They are also returned in the same bottles they were sent out in. At a minimum, a trip blank must be analyzed for volatile organics. Inclusion of additional parameters is at the discretion of the NJDEP. Trip blanks and the samples they

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accompany are not held on site for more than 2 calendar days. A trip blank is included in each sample shipment or trip to the field, not to exceed 2 consecutive field days.

10.4.2 Additional QA/QC samples:

10.4.2.1 Duplicate samples: The collection of a duplicate provides for evaluation of the laboratory performance by comparing the analytical data of two samples from the same location. They are included 1 for every 20 samples (5% or 1 a day per site) and submitted as blind samples. They are obtained by alternately filling sample bottles from the same source/device for each parameter. Samples collected for volatile organics are sampled from the same bailer and the first set of bottles filled.

10.4.2.2 Matrix spike/matrix spike duplicate or MS/MSD samples: The laboratory is supplied with triple volume in order to perform the MS/MSD samples. This does not include trip or field blanks. They should occur once in every case of field samples, every 20 field samples or each 14 day calendar period in which a site is being worked at and samples collected.

10.5 Sample preservation: Sample bottles are preserved by the laboratory according to the analytical requirements. Refer to SOP SAM-0200, Sample Containers, Preservation and Holding Times and also the NJDEP Field Sampling Procedures Manual.

11 CALIBRATION:

11.1 All instruments used for field readings are calibrated as follows:

11.1.1 The use of YSI Sondes must start out with a calibration using pH buffer solution standards and specific conductivity solutions to check and calibrate accuracy before each day of use.

11.1.2 HNUs are calibrated with a known calibration gas before each day of use.

11.1.3 Dissolved oxygen meters are checked against a Winkler method test weekly.

11.1.4 Turbidity meters are checked against standards regularly with each use.

11.1.5 Cooler thermometers are calibrated against a NIST traceable thermometer annually.

11.1.6 All calibrations for a given days use are recorded in the logbook provided for each instrument.

11.1.7 Refer to the equipment directions for calibration instructions.

12 PROCEDURE: The following describes the purging and sampling procedures for the low flow method for the collection of ground water samples. It provides steps for dedicated and non-dedicated systems.

12.1 Pre-Sampling Activities (Dedicated and Non-dedicated systems):

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- 12.1.1 Start with the well known or believed to have the least contaminated ground water and proceed systematically to the well with the most contaminated ground water.
 - 12.1.2 Check and record the condition of the monitoring well for damage or evidence of tampering. Lay out polyethylene sheeting and place monitoring, purging and sampling equipment on the sheeting.
 - 12.1.3 Unlock the well head and remove the well cap. Record the location, time, and date in the field logbook.
 - 12.1.4 Monitor for volatile organics with a PID at the rim of the casing and record the reading in the field logbook.
 - 12.1.5 Free product check (Light non-Aqueous Phase liquids and Dense Non-Aqueous Phase Liquids):
 - 12.1.5.1 An ORS meter is used to determine interfaces and the presence or absence of product is also determined. If product is detected, the thickness of the product is measured and recorded.
 - 12.1.5.2 The thickness of DNAPLs and LNAPLs must be performed prior to purging the well. The layers of LNAPLs and DNAPLs are sampled and analyzed for chemical and physical parameters. The LNAPLs are sampled by using a bottom filling bailer, lowered through the LNAPL layer but not significantly down into the next phase. LNAPLs have a low solubility in water and tend to float on the water surface. The LNAPL sample should be analyzed for chemical composition (volatile and semi-volatile organics) and physical parameters (specific gravity, water solubility and vapor pressure of the liquid). DNAPLs are sampled by using a dual check valve bailer or bladder pump. DNAPLs include chlorinated solvents and other chemicals that have specific gravities greater than water. The DNAPL sample should be analyzed for chemical composition by fingerprinting (TCE or coal tar) and physical composition (specific gravity, water solubility and equilibrium vapor pressure of the liquid).
 - 12.1.6 Measure the depth to water (nearest 0.01 feet) relative to the reference measuring point on the well casing and record it in the field logbook. This measurement should be taken a second time for confirmation.
 - 12.1.7 Check the well or field information for the total depth of the monitoring well. Use the depth to water and the total depth of the monitoring well to calculate the volume of the water in the well or the volume of one casing. Record the information in the field logbook.
- 12.2 Purging and Sampling Activities:

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TITLE: Low Flow Monitor Well Sampling

- 12.2.1 Non-dedicated system: Slowly lower the pump and tubing down the well until the location of the pump intake is set at a pre-determined location within the screen interval. Record pump location in the field logbook.
- 12.2.2 Dedicated system: Pump has already been installed. Refer to the well information and record the depth of the pump intake in the field logbook.
- 12.2.3 Non-dedicated and dedicated systems: Measure the water level (nearest 0.01 feet) and record it in the logbook, leave the water level indicator probe in the well.
- 12.2.4 Non-dedicated and dedicated systems: Connect the discharge line from the pump to the flow cell. A "T" connection is needed prior to the flow cell to allow for the collection of water for the turbidity measurements. The discharge line from the flow-through cell must be directed to a container to contain the purge water during the purging and sampling of the well.
- 12.2.5 Non-dedicated and dedicated systems: Start pumping the well at a low flow rate (0.2-0.5 L/min) and slowly increase the speed. The water level should be monitored at approximately every 5 minutes. Maintain a steady flow rate while maintaining a drawdown of less than 0.33 feet. If drawdown is greater than 0.33 feet, lower the flow rate. This flow rate may be difficult to maintain and may require several adjustments.
- 12.2.6 Non-dedicated and dedicated systems: Measure the discharge rate of the pump with a graduated cylinder and a stop watch. Also, measure the water level and record both the flow rate and water level in the logbook. Continue this monitoring every five minutes during purging.
- 12.2.7 Non-dedicated and dedicated systems: During the purging, a minimum of one tubing volume must be purged prior to recording the water quality indicator parameters. Then monitor the water quality indicator parameters every five minutes. The water quality indicator parameters are turbidity, dissolved oxygen, specific conductance (conductivity), pH, redox potential and temperature. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows:
 - 12.2.7.1 Parameter, pH, stabilization criteria, ± 0.1 pH units.
 - 12.2.7.2 Parameter, Conductivity, stabilization criteria, $\pm 3\%$ S/cm.
 - 12.2.7.3 Parameter, redox potential, ± 10 millivolts.
 - 12.2.7.4 Parameter, turbidity, stabilization criteria, $\pm 10\%$ NTUs.
 - 12.2.7.5 Parameter, dissolved oxygen, stabilization criteria, ± 0.3 mg/L.
- 12.2.8 If the water level is approaching the top of the screen and the well cannot be maintained at 0.33 feet, reduce the flow rate or turn the pump off (for 15 minutes) and allow for recovery. Under no circumstances should the well be pumped dry. Begin pumping at a lower flow rate, if the water draws-down to the top of the screened interval again turn the pump off and allow for recovery.

STANDARD OPERATING PROCEDURE

SOP No.: SAM-0223

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CATEGORY: Sample Handling

TITLE: Low Flow Monitor Well Sampling

If two tubing volumes have been removed during purging then sampling can proceed next time the pump is turned on. This information should be noted in the field logbook with a recommendation for a different purging and sampling procedure.

- 12.2.9 Non-dedicated and dedicated systems: Maintain the same pumping rate or reduce it slightly for sampling (0.2 to 0.5 liters per minute) in order to minimize disturbance of the water column. Samples should be collected directly from the discharge port of the pump tubing prior to passing through the flow-through cell. Disconnect the pump's tubing from the flow-through cell so that the samples are collected for dissolved gases or volatile organic analyses, the tubing needs to be completely full of ground water to prevent the ground water from being aerated as the ground water flows through the tubing. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container. When sampling the volatile organic containers, a meniscus must be formed over the mouth of the vial to eliminate the formation of air bubbles and head space prior to capping. The samples are collected in the following order:

- 12.2.9.1 Volatile organics.
- 12.2.9.2 Purgeable organic carbons.
- 12.2.9.3 Purgeable organic halogens.
- 12.2.9.4 Total organic halogens.
- 12.2.9.5 Total organic carbon.
- 12.2.9.6 Base neutrals/acid extractables.
- 12.2.9.7 TPHC/oil and grease.
- 12.2.9.8 PCB's/pesticides.
- 12.2.9.9 Total metals.
- 12.2.9.10 Dissolved metals.
- 12.2.9.11 Phenols, cyanide.
- 12.2.9.12 Sulfate and chloride.
- 12.2.9.13 Turbidity.
- 12.2.9.14 Nitrate and ammonia.
- 12.2.9.15 Preserved inorganics.
- 12.2.9.16 Radionuclides.
- 12.2.9.17 Non-preserved inorganics.
- 12.2.9.18 Bacteria.

- 12.2.10 Non-dedicated systems: Remove the pump from the well. Decontaminate the pump and properly dispose of the tubing.

- 12.2.11 Dedicated system: Disconnect the tubing that extends from the plate at the wellhead (or cap) and discard after use.

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CATEGORY: Sample Handling

TITLE: Low Flow Monitor Well Sampling

12.2.12 Non-dedicated system: Before locking the well, measure and record the well depth (to 0.1 feet). Measure the depth a second time to confirm the initial reading. The measurements should agree to within 0.01 feet or remeasure.

12.2.13 Non-dedicated and dedicated systems: Close and lock the well.

12.2.14 Decontamination procedures for the water level meter and field parameter sensors:

12.2.14.1 The water level meter will be hand washed with Alconox and a scrubber. They will then be rinsed with distilled/deionized water.

12.2.14.2 The field parameter sensors will be rinsed with distilled/deionized water between sampling locations. After the sampling event, the sensors must be cleaned and maintained per the manufacturer's requirements.

12.2.15 Decontamination procedure for the pump:

12.2.15.1 The outside of the pump, tubing, support cable and electrical wires must be pressure sprayed with soapy water, tap water and distilled/deionized water. Spray until water is flowing off tubing after each rinse. Use a scrubber to help remove visible dirt and contaminants.

12.2.15.2 Place the sampling pump in a bucket with distilled/deionized water. It must be completely submerged in the water. Add a small amount of Alconox to the water.

12.2.16 To prevent cross-contamination, the sampling should proceed from the least to the most contaminated wells.

12.2.17 Several activities need to be completed and documented once ground water sampling has been completed.

12.2.17.1 Ensure that all of the field equipment has been decontaminated and returned to their proper storage locations.

12.2.17.2 All paperwork should be processed this includes chain of custody and field notes.

13 CALCULATIONS:

13.1 The following are calculations performed in the field:

13.1.1 Linear feet of water: This is calculated by knowing the total depth of the well and subtracting the depth to water measured by a depth meter. These two numbers should be measured to within 0.01 feet. Through this calculation, the linear feet of water is determined (total well depth – depth to water = linear feet of water).

13.1.2 Volume to be purged and volume not to be exceeded: Utilizing the linear feet of water and then multiplying it by the volume per foot for the appropriate casing will equal the amount of water in the casing. The amount of water in the casing

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CATEGORY: Sample Handling

TITLE: Low Flow Monitor Well Sampling

multiplied by 3 equals the total minimum volume to be purged. It should be noted that the amount purged should not exceed 5 times the amount of standing water in the well.

13.1.2.1 Capacity of Common Casing Diameters:

Casing Diameter (ft)	Gallons/linear foot
2 inch (0.1667)	0.1632
4 inch (0.3333)	0.6528
6 inch (0.5000)	1.4688
8 inch (0.6667)	2.6112
10 inch(0.8333)	4.0800
12 inch(1.0000)	5.8752

13.1.3Purge rate: Multiply the flow rate (ml/min) by 0.0002642 to get gallons per minute.

14 POLLUTION PREVENTION:

14.1For pollution prevention, please refer to SOP No. SAM-0222.

15 WASTE MANAGEMENT:

15.1For sample disposal, please refer to SOP No. SAM-0220.

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CATEGORY: Sample Handling

TITLE: Low Flow Monitor Well Sampling

16 TABLES AND DIAGRAMS:

Table 1

MONITORING WELL SAMPLING DATA

LOCATION:	Hnu Calibration:
MW #:	Sonde Calibration:
NJDEP ID #:	pH: 7.00/10.00/4.00 Buffers
NJDEP CERT#:	Sp Cond/Cond: 26.5u ohms/cm Sol (KCl)
SAMPLING CONTRACTOR:	DO: % Humidity 760mm (Bar Press)
SAMPLER:	Temp:
DATE:	Turb: Stab Cal set for 2100P
WEATHER:	ORP: 235 MV Zobell Sol
TIDE:	HACH Meter Lot:
WELL CONDITION:	
LNAPLs:	DNAPLs:
ELEV. OF INNER CASING SURVEY MARE: ft	
INNER CASING DIA: inch	
DEPTH TO WATER: ft	
Before Purge Start: ft Previous Day: ft	After Sampling: ft
DEPTH OF WELL: ft	
DEPTH TO TOP OF SCREEN: ft	
DEPTH of PUMP/TUBE INTAKE: ft	TUBING: Food Grade ¼ " Polyethylene
HEIGHT OF WATER: ft	
() X 0.163 or 0.65 X 3 =	
GALLONS OF H ₂ O TO BE PURGED: Gal	
PURGE METHOD: (FLOW at >100 to <500 gpm): 2" REDIFLO 2 GRUNDPHOS SUBMERSIBLE PUMP	
Purged at mL/Min or Gal/Min (mL to Gal = mL X 0.0002642 = Gal	
PURGED RATE: gpm Start at at mL/min to mL/min at until end	
Hnu READING: ppm (well)	
Hnu READING: ppm (well cap)	
PURGE START TIME:	
pH: su ORP mv	Temperature: °F Turbidity: NTU
Dissolved O ₂ : mg/L	Specific Conductivity: us/cm
PURGE END TIME:	
pH: su ORP mv	Temperature: °F Turbidity: NTU
Dissolved O ₂ : mg/L	Specific Conductivity: us/cm
DEPTH TO H ₂ O AFTER PURGE AND SAMPLING: ft	
SAMPLING METHOD: (Through pump and tubing, flow cell disconnected)	
SAMPLE START TIME:	
pH: su ORP mv	Temperature: °F Turbidity: NTU
Dissolved O ₂ : mg/L	Specific Conductivity: us/cm
SAMPLE END TIME:	
ANALYTES:	COMMENTS:

STANDARD OPERATING PROCEDURE

SOP No.: SAM-0223
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CATEGORY: Sample Handling
TITLE: Low Flow Monitor Well Sampling

Table 2

Low Flow Well Sampling Data

Date:

Well ID:

NJDEP # :

Initial Purge Start:

Initial Depth to Water:

Time	Temp °C	pH (su)	Cond (us/cm)	DO (mg/L)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Flow Rate (ml/min)

Sample Start Time:

Attachment 5

Laboratory Analytical Reports – Soil

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS

PHONE: (732) 532-6224 FAX: (732) 532-6263

WET-CHEM - METALS - ORGANICS - FIELD SAMPLING

CERTIFICATIONS: NJDEP #13461



ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: Site 108

Site/108

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
108MW04 (6.5-7.0')	1046401	Soil	27-Oct-10 09:45	10/27/10
108MW04 (7.0-8.0')	1046302	Soil	27-Oct-10 10:00	10/27/10

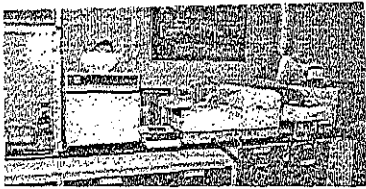
ANALYSIS:
FORT MONMOUTH ENVIRONMENTAL LAB.
TAL METALS, %SOLIDS

ACCUTEST LABORATORIES
TOC


Dean Tardiff/Date: 12/1/10
Laboratory Manager

CHAIN OF CUSTODY

000001



Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703

Telephone: (732) 532-4359; Fax (732) 532-6263; email: Dean.Tardiff@us.army.mil

Chain of Custody Record

NJDEP Certification #13461

Customer: Charles Appleby				Project No: 11-16772		Analysis Parameters						Comments:	
Telephone: (732) 532-2692				Location: Near 108MW04		VOA+15	ABN+25	Pest/PCBs	TAL Metals	% Solids	Total organic carbon		
() DERA () OMA () Other: _____													
Sampler's Name / Company: John Montgomery					Sample	#							Remarks/Preservation Method
Work Order #		Sample Location	Date	Time	Type	bottles							
10463	01	108MW04 (6.5-7.0')	10/27/2010	0945	Soil	1				X	X	X	
	02	108MW04 (7.0-8.0')	10/27/2010	1000	Soil	1				X	X	X	
	03												
	04												
	05												
	06												
	07												
	08												
	09												
	10												
	11												
	12												
	13												
	14												
	15												
	16												
	17												
Relinquished by (signature):		Date/Time:		Received by (signature):		Relinquished by (signature):		Date/Time:					
		10/27/10 1045											
Relinquished by (signature):		Date/Time:		Received by (signature):		Relinquished by (signature):		Date/Time:					
Report Type: () Full; (X) Reduced; () Standard; () Screen / non-certified; () EDD						Comments:							
Turnaround time: (X) Standard 3 wks; () Rush ____ wks; () ASAP Verbal ____ hrs.													

SAMPLE RECEIPT FORM

Date Received: 10-27-10

Work Order ID#: 104623

Site/Proj. Name: Bldg 108

Cooler Temp (°C): N/A

Received By: J. Dienghina
(Print name)

Sign: J. Dienghina

Check the appropriate box

1. Did the samples come in a cooler?
2. Were samples rec'd in good condition?
3. Was the chain of custody filled out correctly and legibly?
4. Was the chain of custody signed in the appropriate place?
5. Did the labels agree with the chain of custody?
6. Were the correct containers/preservatives used?
7. Was a sufficient amount of sample supplied?
8. Were air bubbles present in VOA vials?
9. Were samples received on ice?
10. Were analyze-immediately tests perform within 15 minutes

yes	no	n/a
yes	no	
yes	no	
yes	no	
yes	no	
yes	no	
yes	no	
yes	no	n/a
yes	no	
yes	no	n/a

Fill out the following table for each sample bottle

Lims ID	pH	Preservative	Sample ID	pH	Preservative

Comments: _____

000003

Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703

Tel (732)532-4359 Fax (732)532-6263 EMail:dean.tardiff@us.army.mil

NJDEP Certification #13461

Chain of Custody Record

[illegible]

000004

CONFORMANCE/ NON-CONFORMANCE SUMMARY

METALS ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY REPORT

Project: 10463
Method: 6010B

Indicate
Yes, No, N/A

- | | | |
|----|--|------------|
| 1. | Initial and Continuing Calibration Verifications Meet Criteria
<u>CCV-2 TL = 88.75%</u> | <u>✓</u> |
| 2. | ICP Interference Check Sample Results Meet Criteria | <u>✓</u> |
| 3. | Serial Dilutions Meet Criteria
<u>1046301</u> | <u> </u> |
| 4. | Laboratory Control Samples Meet Criteria
<u>Al = 130% Fe = 162%</u> | <u>No.</u> |
| 5. | Preparation, Method and Calibration Blank Contamination
If yes, list compounds and concentrations in each blank | <u>✓</u> |
| 6. | Spike Sample Recoveries Meet Criteria
<u>1046301</u> | <u>✓</u> |
| 7. | Duplicates Meet Criteria
<u>1046301</u>
<u>Al = 23.5% Ca = 25.8% K = 63% Mg = 46.3%</u> | <u>No.</u> |
| 8. | Analysis Holding Time Met
If not met, list number of days exceeded for each sample | <u>✓</u> |

Additional Comments Low chk Be = 167% K = 135%

Analyst: Kan Sander Date: 11-23-10
Administrative
Review: Dean Tard Date: 12/1/10

000006

FLAA/GFAA ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY
REPORT

Lab ID: 10463
Method: 3112B
7471B

Indicate
Yes, No, N/A

- | | | |
|----|--|----------|
| 1. | Initial Calibration has a correlation coefficient of 0.995 or higher | <u>✓</u> |
| 2. | Initial and Continuing Calibration Verifications Meet Criteria

_____ | <u>✓</u> |
| 3. | Laboratory Control Samples Meet Criteria

_____ | <u>✓</u> |
| 4. | Preparation, Method and Calibration Blank Contamination
If yes, list compounds and concentrations in each blank

_____ | <u>✓</u> |
| 5. | Spike Sample Recoveries Meet Criteria
<u>1046301</u>

_____ | <u>✓</u> |
| 6. | Duplicates Meet Criteria
<u>1046301</u>

_____ | <u>✓</u> |
| 7. | Analysis Holding Time Met
If not met, list number of days exceeded for each sample

_____ | <u>✓</u> |
| 8. | Over range samples are diluted within the calibration.
List samples that exceed high standard and are flagged with an
"E" (estimate).

_____ | <u>✓</u> |

Additional Comments _____

Laboratory Manager: Sean Taniel Date: 12/1/10
Akanza 11-23-10

000007

TAL METALS

000008

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 10463
 Sample Received: NA
 Sample Matrix: Aqueous
 Date Prepared: 11/12/10

Site: 108MW04

Field ID: Method Blank

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/L)

Element	Date of Analysis	Result (mg/L)	R.L. (mg/L)	MDL (mg/L)
Aluminum	11/16/10	ND	0.500	0.235
Antimony	11/16/10	ND	0.010	0.0047
Arsenic	11/16/10	ND	0.010	0.0078
Barium	11/16/10	ND	0.005	0.0017
Beryllium	11/16/10	ND	0.0005	0.00004
Cadmium	11/16/10	ND	0.002	0.0004
Calcium	11/16/10	ND	1.00	0.261
Chromium	11/16/10	ND	0.005	0.0012
Cobalt	11/16/10	ND	0.002	0.0004
Copper	11/16/10	ND	0.05	0.026
Iron	11/16/10	ND	1.00	0.349
Lead	11/16/10	ND	0.050	0.017
Magnesium	11/16/10	ND	1.00	0.113
Manganese	11/16/10	ND	0.005	0.0022
Mercury	11/10/10	ND	0.0005	0.0001
Nickel	11/16/10	ND	0.005	0.0013
Potassium	11/16/10	ND	1.00	0.331
Selenium	11/16/10	ND	0.050	0.018
Silver	11/16/10	ND	0.005	0.0008
Sodium	11/16/10	ND	5.00	1.27
Thallium	11/16/10	ND	0.010	0.0059
Vanadium	11/16/10	ND	0.005	0.0006
Zinc	11/16/10	ND	0.050	0.018

ND = Not Detected, NLE = No Limit Established,
 R.L. = Reporting limit, MDL = Method Detection Limit
 Estimated results between MDL & R.L

000009

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 1046301
 Sample Received: 10/27/10
 Sample Matrix: Soil

Site: 108MW04

Field ID: 108MW04 (6.5-7.0')

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/kg)

Element	Date of Analysis	Result (mg/kg)	Soil Cleanup Criteria (mg/kg)*	R.L. (mg/kg)	MDL (mg/kg)
Aluminum	11/16/10	2540	78000	117.39	55.173
Antimony	11/16/10	ND	31	2.35	1.103
Arsenic	11/16/10	2.95	19	2.35	1.831
Barium	11/16/10	5.30	16000	1.17	0.399
Beryllium	11/16/10	0.292	16	0.12	0.009
Cadmium	11/16/10	0.609	78	0.47	0.094
Calcium	11/16/10	656	NLE	234.78	61.277
Chromium	11/16/10	17.7	NLE	1.17	0.282
Cobalt	11/16/10	0.766	1600	0.47	0.094
Copper	11/16/10	6.14	3100	11.74	6.104
Iron	11/16/10	6660	NLE	234.78	81.938
Lead	11/16/10	15.7	400	11.74	3.991
Magnesium	11/16/10	611	NLE	234.78	26.530
Manganese	11/16/10	9.49	11000	1.17	0.517
Mercury	11/10/10	0.021	23	0.11	0.021
Nickel	11/16/10	1.95	1600	1.17	0.305
Potassium	11/16/10	1200	NLE	234.78	77.712
Selenium	11/16/10	ND	390	11.74	4.226
Silver	11/16/10	0.664	390	1.17	0.188
Sodium	11/16/10	ND	NLE	1173.89	298.169
Thallium	11/16/10	ND	5	2.35	1.385
Vanadium	11/16/10	11.3	78	1.17	0.141
Zinc	11/16/10	12.9	23000	11.74	4.226

ND = Not Detected, NLE = No Limit Established, NA = Standard Not Available

* Residential Direct Contact Soil Remediation Standard as per N.J.A.C. 7:26D June 2, 2008

R.L. = Reporting limit, MDL = Method Detection Limit

Estimated results between MDL & R.L.

000010

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 1046302
Sample Received: 10/27/10
Sample Matrix: Soil

Site: 108MW04

Field ID: Field ID: 108MW04 (7.0-8.0')

Method of Digestion: E.P.A SW-846, Method 3051A
Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/kg)

Element	Date of Analysis	Result (mg/kg)	Soil Cleanup Criteria (mg/kg)*	R.L. (mg/kg)	MDL (mg/kg)
Aluminum	11/16/10	8110	78000	106.27	49.945
Antimony	11/16/10	1.38	31	2.13	0.999
Arsenic	11/16/10	15.1	19	2.13	1.658
Barium	11/16/10	16.5	16000	1.06	0.361
Beryllium	11/16/10	0.800	16	0.11	0.009
Cadmium	11/16/10	1.83	78	0.43	0.085
Calcium	11/16/10	1780	NLE	212.53	55.471
Chromium	11/16/10	65.0	NLE	1.06	0.255
Cobalt	11/16/10	1.66	1600	0.43	0.085
Copper	11/16/10	ND	3100	10.63	5.526
Iron	11/16/10	23500	NLE	212.53	74.174
Lead	11/16/10	16.5	400	10.63	3.613
Magnesium	11/16/10	2010	NLE	212.53	24.016
Manganese	11/16/10	23.0	11000	1.06	0.468
Mercury	11/10/10	0.025	23	0.120	0.023
Nickel	11/16/10	4.33	1600	1.06	0.276
Potassium	11/16/10	4030	NLE	212.53	70.348
Selenium	11/16/10	ND	390	10.63	3.826
Silver	11/16/10	1.85	390	1.06	0.170
Sodium	11/16/10	ND	NLE	1062.66	269.917
Thallium	11/16/10	ND	5	2.13	1.254
Vanadium	11/16/10	36.4	78	1.06	0.128
Zinc	11/16/10	28.6	23000	10.63	3.826

ND = Not Detected, NLE = No Limit Established, NA = Standard Not Available

* Residential Direct Contact Soil Remediation Standard as per N.J.A.C. 7:26D June 2, 2008

R.L. = Reporting limit, MDL = Method Detection Limit.

Estimated results between MDL & R.L.

000011

WET CHEMISTRY

000012

Report of Analysis

Page 1 of 1

3.1


Client Sample ID: 1046301 108MW04 (6.5-7.0)

Lab Sample ID: JA61228-1

Matrix: SO - Soil

Project: Building 482

Date Sampled: 10/27/10

Date Received: 11/10/10

Percent Solids: 85.4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	85.4		%	1	11/18/10	JS	SM18 2540G
Total Organic Carbon ^a	558	120	mg/kg	1	11/12/10 15:17	SJG	LLOYD KAHN 1988

(a) Analyzed outside of hold time

RL = Reporting Limit

000013

Report of Analysis

Page 1 of 1



Client Sample ID: 1046302 108MW04 (7.0-8.0)

Lab Sample ID: JA61228-2

Matrix: SO - Soil

Project: Building 482

Date Sampled: 10/27/10

Date Received: 11/10/10

Percent Solids: 89.9

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	89.9		%	1	11/18/10	JS	SM18 2540G
Total Organic Carbon ^a	365	110	mg/kg	1	11/12/10 15:26	SJG	LLOYD KAHN 1988

(a) Analyzed outside of hold time

RL = Reporting Limit

000014

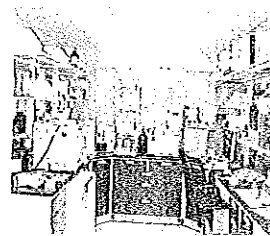
FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS

PHONE: (732) 532-6224 FAX: (732) 532-6263

WET-CHEM - METALS - ORGANICS - FIELD SAMPLING

CERTIFICATIONS: NJDEP #13461



ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: Site M2

Site/M2

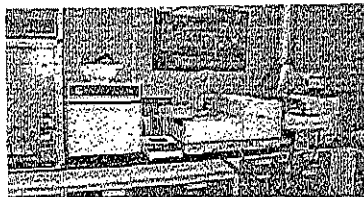
Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
M2-MW13 (16.0-20.0')	1049201	Soil	16-Nov-10 14:00	11/16/10
M2-MW13 (8.0-12.0')	1049202	Soil	16-Nov-10 14:15	11/16/10

ANALYSIS:
FORT MONMOUTH ENVIRONMENTAL LAB.
TAL METALS, %SOLIDS

ACCUTEST LABORATORIES
TOC


Dean Tardiff/Date: 12/16/10
Laboratory Manager

CHAIN OF CUSTODY



Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703

Telephone: (732) 532-4359; Fax (732) 532-6263; email: Dean.Tardiff@us.army.mil

Chain of Custody Record

[illegible]

SAMPLE RECEIPT FORM

Date Received: 11-16-10

Work Order ID#: 10492

Site/Proj. Name: 1112

Cooler Temp ($^{\circ}\text{C}$): 11.1

Received By: S. Venkatesh
(Print name)

Sign: [Signature]

Check the appropriate box

1. Did the samples come in a cooler?
2. Were samples rec'd in good condition?
3. Was the chain of custody filled out correctly and legibly?
4. Was the chain of custody signed in the appropriate place?
5. Did the labels agree with the chain of custody?
6. Were the correct containers/preservatives used?
7. Was a sufficient amount of sample supplied?
8. Were air bubbles present in VOA vials?
9. Were samples received on ice?
10. Were analyze-Immediately tests perform within 15 minutes

yes	no	n/a
yes	no	
yes	no	
yes	no	
yes	no	
yes	no	
yes	no	
yes	no	n/a
yes	no	
yes	no	n/a

Fill out the following table for each sample bottle

[illegible]

Comments: _____

000003

**TAL
METALS
(SOILS)**

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 10492
 Sample Received: NA
 Sample Matrix: Aqueous
 Date Prepared: 11/24/10

Site: M2

Field ID: Method Blank

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/L)

Element	Date of Analysis	Result (mg/L)	R.L. (mg/L)	MDL (mg/L)
Aluminum	11/30/01	0.590	0.500	0.235
Antimony	11/30/01	ND	0.010	0.0047
Arsenic	11/30/01	ND	0.010	0.0078
Barium	11/30/01	0.004	0.005	0.0017
Beryllium	11/30/01	ND	0.0005	0.00004
Cadmium	11/30/01	ND	0.002	0.0004
Calcium	11/30/01	0.380	1.00	0.261
Chromium	11/30/01	ND	0.005	0.0012
Cobalt	11/30/01	ND	0.002	0.0004
Copper	11/30/01	ND	0.05	0.026
Iron	11/30/01	ND	1.00	0.349
Lead	11/30/01	ND	0.050	0.017
Magnesium	11/30/01	ND	1.00	0.113
Manganese	11/30/01	ND	0.005	0.0022
Mercury	12/23/10	ND	0.0005	0.0001
Nickel	11/30/01	0.002	0.005	0.0013
Potassium	11/30/01	0.550	1.00	0.331
Selenium	11/30/01	ND	0.050	0.018
Silver	11/30/01	ND	0.005	0.0008
Sodium	11/30/01	ND	5.00	1.27
Thallium	11/30/01	ND	0.010	0.0059
Vanadium	11/30/01	ND	0.005	0.0006
Zinc	11/30/01	0.022	0.050	0.018

ND = Not Detected, NLE = No Limit Established,
 R.L. = Reporting limit, MDL = Method Detection Limit
 Estimated results between MDL & R.L

000005

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 1049201
 Sample Received: 11/16/10
 Sample Matrix: Soil

Site: M2

Field ID: M2MW13 (16.0-20.0')

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/kg)

Element	Date of Analysis	Result (mg/kg)	Soil Cleanup Criteria (mg/kg)*	R.L. (mg/kg)	MDL (mg/kg)
Aluminum	11/30/01	11500	78000	108.46	50.974
Antimony	11/30/01	0.895	31	2.17	1.019
Arsenic	11/30/01	6.60	19	2.17	1.692
Barium	11/30/01	17.3	16000	1.08	0.369
Beryllium	11/30/01	2.09	16	0.11	0.009
Cadmium	11/30/01	3.63	78	0.43	0.087
Calcium	11/30/01	5130	NLE	216.91	56.614
Chromium	11/30/01	134	NLE	1.08	0.260
Cobalt	11/30/01	2.29	1600	0.43	0.087
Copper	11/30/01	ND	3100	10.85	5.640
Iron	11/30/01	53900	NLE	216.91	75.702
Lead	11/30/01	9.77	400	10.85	3.688
Magnesium	11/30/01	7250	NLE	216.91	24.511
Manganese	11/30/01	13.2	11000	1.08	0.477
Mercury	12/23/10	ND	23	0.11	0.023
Nickel	11/30/01	9.54	1600	1.08	0.282
Potassium	11/30/01	21600	NLE	216.91	71.798
Selenium	11/30/01	ND	390	10.85	3.904
Silver	11/30/01	14.0	390	1.08	0.174
Sodium	11/30/01	ND	NLE	1084.56	275.479
Thallium	11/30/01	ND	5	2.17	1.280
Vanadium	11/30/01	25.4	78	1.08	0.130
Zinc	11/30/01	67.4	23000	10.85	3.904

ND = Not Detected, NLE = No Limit Established, NA = Standard Not Available

* Residential Direct Contact Soil Remediation Standard as per N.J.A.C. 7:26D June 2, 2008

R.L. = Reporting limit, MDL = Method Detection Limit

Estimated results between MDL & R.L.

000006

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 1049202
 Sample Received: 11/16/10
 Sample Matrix: Soil

Site: M2

Field ID: Field ID: M2MW13 (8.0-12.0')

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/kg)

Element	Date of Analysis	Result (mg/kg)	Soil Cleanup Criteria (mg/kg)*	R.L. (mg/kg)	MDL (mg/kg)
Aluminum	11/30/01	9550	78000	192.48	90.466
Antimony	11/30/01	2.36	31	3.85	1.809
Arsenic	11/30/01	7.40	19	3.85	3.003
Barium	11/30/01	70.4	16000	1.92	0.654
Beryllium	11/30/01	1.66	16	0.19	0.015
Cadmium	11/30/01	2.33	78	0.77	0.154
Calcium	11/30/01	1490	NLE	384.96	100.475
Chromium	11/30/01	106	NLE	1.92	0.462
Cobalt	11/30/01	5.76	1600	0.77	0.154
Copper	11/30/01	ND	3100	19.25	10.009
Iron	11/30/01	25800	NLE	384.96	134.351
Lead	11/30/01	8.94	400	19.25	6.544
Magnesium	11/30/01	2970	NLE	384.96	43.500
Manganese	11/30/01	26.7	11000	1.92	0.847
Mercury	12/23/10	0.088	23	0.20	0.040
Nickel	11/30/01	15.0	1600	1.92	0.500
Potassium	11/30/01	4870	NLE	384.96	127.422
Selenium	11/30/01	ND	390	19.25	6.929
Silver	11/30/01	5.91	390	1.92	0.308
Sodium	11/30/01	ND	NLE	1924.80	488.899
Thallium	11/30/01	ND	5	3.85	2.271
Vanadium	11/30/01	44.8	78	1.92	0.231
Zinc	11/30/01	63.0	23000	19.25	6.929

ND = Not Detected, NLE = No Limit Established, NA = Standard Not Available

* Residential Direct Contact Soil Remediation Standard as per N.J.A.C. 7:26D June 2, 2008

R.L. = Reporting limit, MDL = Method Detection Limit.

Estimated results between MDL & R.L.

001007

WET CHEMISTRY

Report of Analysis

Page 1 of 1

Client Sample ID: 1049201 M2-MW13 (16-20')

Lab Sample ID: JA62105-1

Matrix: SO - Soil

Project: M2

Date Sampled: 11/16/10

Date Received: 11/19/10

Percent Solids: 79.0

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	79		%	1	12/02/10	DK	SM18 2540G
Total Organic Carbon	762	130	mg/kg	1	11/22/10 15:36	SJC	LLOYD KAHN 1988

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 1049202 M2-MW13 (8-12')

Lab Sample ID: JA62105-2

Matrix: SO - Soil

Project: M2

Date Sampled: 11/16/10

Date Received: 11/19/10

Percent Solids: 42.2

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	42.2		%	1	12/02/10	DD	SM18 2540G
Total Organic Carbon	87700	240	mg/kg	1	11/22/10 15:06	SJC	LLOYD KAHN 1988

RL = Reporting Limit

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS

PHONE: (732) 532-6224 FAX: (732) 532-6263

WET-CHEM - METALS - ORGANICS - FIELD SAMPLING

CERTIFICATIONS: NJDEP #13461



ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: Site 296

Site/296

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
296MW06 (3.5-4.0')	1047001	Soil	02-Nov-10 14:45	11/02/10
296MW06 (12.0-12.5')	1047002	Soil	02-Nov-10 15:00	11/02/10

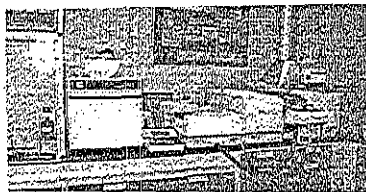
ANALYSIS:
FORT MONMOUTH ENVIRONMENTAL LAB.
TAL METALS, %SOLIDS

ACCUTEST LABORATORIES
TOC


Dean Tardiff/Date: 11/23/10
Laboratory Manager

CHAIN OF CUSTODY

000001



Fort Monmouth Environmental Testing Laboratory

Telephone: (732) 532-4359; Fax (732) 532-6263; email: Dean.Tardiff@us.army.mil

Chain of Custody Record

NJDEP Certification #13461

[illegible]

SAMPLE RECEIPT FORM

Date Received: 11-2-10

Work Order ID#: 104470

Site/Proj. Name: Site 296

Cooler Temp (°C): ICE

Received By: J. Verquaa
(Print name)

Sign: [Signature]

Check the appropriate box

- | | | | |
|---|-----|----|-----|
| 1. Did the samples come in a cooler? | yes | no | n/a |
| 2. Were samples rec'd in good condition? | yes | no | |
| 3. Was the chain of custody filled out correctly and legibly? | yes | no | |
| 4. Was the chain of custody signed in the appropriate place? | yes | no | |
| 5. Did the labels agree with the chain of custody? | yes | no | |
| 6. Were the correct containers/preservatives used? | yes | no | |
| 7. Was a sufficient amount of sample supplied? | yes | no | |
| 8. Were air bubbles present in VOA vials? | yes | no | n/a |
| 9. Were samples received on ice? | yes | no | |
| 10. Were analyze-immediately tests perform within 15 minutes | yes | no | n/a |

Fill out the following table for each sample bottle

Lims ID	pH	Preservative	Sample ID	pH	Preservative

Comments: _____

000003

CONFORMANCE/ NON-CONFORMANCE SUMMARY

FLAA/GFAA ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY
REPORT

Lab ID: 10470
Method: 3112B
7471B

Indicate
Yes, No, N/A

- | | | |
|----|--|------------|
| 1. | Initial Calibration has a correlation coefficient of 0.995 or higher | ✓
----- |
| 2. | Initial and Continuing Calibration Verifications Meet Criteria

_____ | ✓
----- |
| 3. | Laboratory Control Samples Meet Criteria

_____ | ✓
----- |
| 4. | Preparation, Method and Calibration Blank Contamination
If yes, list compounds and concentrations in each blank

_____ | ✓
----- |
| 5. | Spike Sample Recoveries Meet Criteria
<u>1046301</u>

_____ | ✓
----- |
| 6. | Duplicates Meet Criteria
<u>1046301</u>

_____ | ✓
----- |
| 7. | Analysis Holding Time Met
If not met, list number of days exceeded for each sample

_____ | ✓
----- |
| 8. | Over range samples are diluted within the calibration.
List samples that exceed high standard and are flagged with an
"E" (estimate).

_____ | ✓
----- |

Additional Comments _____

Laboratory Manager: *Dee Turner* Date: 11/23/10
Kausz 11-23-10.

000006

METALS ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY REPORT

Project: 10470
Method: 6010B

Indicate
Yes, No, N/A

- | | | |
|----|---|------------|
| 1. | Initial and Continuing Calibration Verifications Meet Criteria
<u>CCV-2 TL = 88.75 %</u> | <u>✓</u> |
| 2. | ICP Interference Check Sample Results Meet Criteria
_____ | <u>✓</u> |
| 3. | Serial Dilutions Meet Criteria
<u>1046301</u> | _____ |
| 4. | Laboratory Control Samples Meet Criteria
<u>Al = 130% Fe = 162%</u> | <u>No.</u> |
| 5. | Preparation, Method and Calibration Blank Contamination
If yes, list compounds and concentrations in each blank

_____ | <u>✓</u> |
| 6. | Spike Sample Recoveries Meet Criteria
<u>1046301</u> | <u>✓</u> |
| 7. | Duplicates Meet Criteria
<u>1046301</u>
<u>Al = 23.5% Ca = 25.8% K = 63.7% Mg = 46.3%</u> | <u>No.</u> |
| 8. | Analysis Holding Time Met
If not met, list number of days exceeded for each sample

_____ | <u>✓</u> |

Additional Comments Low chk Be = 167% K = 135%

Analyst: Akan Samdhu Date: 11-23-10
Administrative
Review: mountain Date: 11/23/10

000007

LABORATORY CHRONICLE

000008

Laboratory Chronicle

Lab ID: 10470

Site: 296

	Date	Hold Time
Date Sampled	11/02/10	NA
Receipt/Refrigeration	11/02/10	NA

Analyses

1. TAL Metals	11/01/10	6 Months
2. Arsenic	11/16/10	6 Months
3. Thallium	11/16/10	6 Months
4. Selenium	11/16/10	6 Months
5. Mercury	10/16/10	28 Days
6. TOC	11/12/10	28 Days

000009

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 10470
 Sample Received: NA
 Sample Matrix: Aqueous
 Date Prepared: 11/12/10

Site: 296MW06

Field ID: Method Blank

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/L)

Element	Date of Analysis	Result (mg/L)	R.L. (mg/L)	MDL (mg/L)
Aluminum	11/16/10	ND	0.500	0.235
Antimony	11/16/10	ND	0.010	0.0047
Arsenic	11/16/10	ND	0.010	0.0078
Barium	11/16/10	ND	0.005	0.0017
Beryllium	11/16/10	ND	0.0005	0.00004
Cadmium	11/16/10	ND	0.002	0.0004
Calcium	11/16/10	ND	1.00	0.261
Chromium	11/16/10	ND	0.005	0.0012
Cobalt	11/16/10	ND	0.002	0.0004
Copper	11/16/10	ND	0.05	0.026
Iron	11/16/10	ND	1.00	0.349
Lead	11/16/10	ND	0.050	0.017
Magnesium	11/16/10	ND	1.00	0.113
Manganese	11/16/10	ND	0.005	0.0022
Mercury	11/10/10	ND	0.0005	0.0001
Nickel	11/16/10	ND	0.005	0.0013
Potassium	11/16/10	ND	1.00	0.331
Selenium	11/16/10	ND	0.050	0.018
Silver	11/16/10	ND	0.005	0.0008
Sodium	11/16/10	ND	5.00	1.27
Thallium	11/16/10	ND	0.010	0.0059
Vanadium	11/16/10	ND	0.005	0.0006
Zinc	11/16/10	ND	0.050	0.018

ND = Not Detected, NLE = No Limit Established,
 R.L. = Reporting limit, MDL = Method Detection Limit
 Estimated results between MDL & R.L

000010

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 1047001
 Sample Received: 11/02/10
 Sample Matrix: Soil

Site: 296MW06

Field ID: 296MW06 (3.5-4')

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/kg)

Element	Date of Analysis	Result (mg/kg)	Soil Cleanup Criteria (mg/kg)*	R.L. (mg/kg)	MDL (mg/kg)
Aluminum	11/16/10	3560	78000	95.5	45.0
Antimony	11/16/10	3.00	31	1.91	0.898
Arsenic	11/16/10	5.02	19	1.91	1.49
Barium	11/16/10	3.67	16000	0.96	0.325
Beryllium	11/16/10	0.475	16	0.10	0.008
Cadmium	11/16/10	1.11	78	0.38	0.076
Calcium	11/16/10	573	NLE	191	50.0
Chromium	11/16/10	73.2	NLE	0.96	0.229
Cobalt	11/16/10	0.573	1600	0.38	0.076
Copper	11/16/10	ND	3100	9.55	4.97
Iron	11/16/10	14100	NLE	191	66.7
Lead	11/16/10	11.3	400	9.55	3.25
Magnesium	11/16/10	1160	NLE	191	21.6
Manganese	11/16/10	3.45	11000	0.96	0.420
Mercury	11/10/10	0.032	23	0.11	0.021
Nickel	11/16/10	1.92	1600	0.96	0.248
Potassium	11/16/10	3210	NLE	191	63.2
Selenium	11/16/10	ND	390	9.55	3.44
Silver	11/16/10	0.873	390	0.96	0.153
Sodium	11/16/10	ND	NLE	955	243
Thallium	11/16/10	ND	5	1.91	1.13
Vanadium	11/16/10	65.2	78	0.96	0.115
Zinc	11/16/10	13.4	23000	9.55	3.44

ND = Not Detected, NLE = No Limit Established, NA = Standard Not Available

* Residential Direct Contact Soil Remediation Standard as per N.J.A.C. 7:26D

R.L. = Reporting limit, MDL = Method Detection Limit

Estimated results between MDL & R.L.

000011

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 1047002
 Sample Received: 11/02/10
 Sample Matrix: Soil

Site: 296MW06

Field ID: Field ID: 296MW06 (12 -12.5')

Method of Digestion: E.P.A SW-846, Method 3051A
 Method of Analysis: EPA SW-846 Method 6010B, 7471A

TAL-METALS RESULTS SUMMARY (mg/kg)

Element	Date of Analysis	Result (mg/kg)	Soil Cleanup Criteria (mg/kg)*	R.L. (mg/kg)	MDL (mg/kg)
Aluminum	11/16/10	4860	78000	107	50.4
Antimony	11/16/10	2.26	31	2.14	1.01
Arsenic	11/16/10	5.77	19	2.14	1.67
Barium	11/16/10	27.3	16000	1.07	0.365
Beryllium	11/16/10	0.768	16	0.11	0.009
Cadmium	11/16/10	1.65	78	0.43	0.086
Calcium	11/16/10	1030	NLE	214	56.0
Chromium	11/16/10	68.8	NLE	1.07	0.257
Cobalt	11/16/10	1.46	1600	0.43	0.086
Copper	11/16/10	3.31	3100	10.72	5.58
Iron	11/16/10	19600	NLE	214	75.0
Lead	11/16/10	11.7	400	10.72	3.65
Magnesium	11/16/10	2060	NLE	214	24.2
Manganese	11/16/10	17.3	11000	1.09	0.478
Mercury	11/10/10	0.043	23	0.11	0.021
Nickel	11/16/10	4.59	1600	1.07	0.279
Potassium	11/16/10	3950	NLE	214	71.0
Selenium	11/16/10	ND	390	10.72	3.86
Silver	11/16/10	1.71	390	1.07	0.172
Sodium	11/16/10	ND	NLE	1072	272
Thallium	11/16/10	ND	5	2.14	1.27
Vanadium	11/16/10	39.2	78	1.07	0.129
Zinc	11/16/10	27.2	23000	10.7	3.86

ND = Not Detected, NLE = No Limit Established, NA = Standard Not Available

* Residential Direct Contact Soil Remediation Standard as per N.J.A.C. 7:26D June 2, 2008

R.L. = Reporting limit, MDL = Method Detection Limit.

Estimated results between MDL & R.L.

000012

WET CHEMISTRY

Report of Analysis

Page 1 of 1

Client Sample ID: 1047001 296MW06 (3.5-4.0')

Lab Sample ID: JA61227-1

Matrix: SO - Soil

Project: Site 296

Date Sampled: 11/02/10

Date Received: 11/10/10

Percent Solids: 83.4

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	83.4		%	1	11/18/10	DK	ASTM 4643-00
Total Organic Carbon	500	120	mg/kg	1	11/12/10 15:52	SJG	LLOYD KAHN 1988

RL = Reporting Limit

000014

Report of Analysis

Page 1 of 1

Client Sample ID: 1047002 296MW06 (12.0-12.5')

Lab Sample ID: JA61227-2

Matrix: SO - Soil

Project: Site 296

Date Sampled: 11/02/10

Date Received: 11/10/10

Percent Solids: 81.8

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Solids, Percent	81.8		%	1	11/18/10	JS	SM18 2540G
Total Organic Carbon	1010	120	mg/kg	1	11/12/10 16:00	SJG	LLOYD KAHN 1988

RL = Reporting Limit

000015

Attachment 6

Laboratory Analytical Reports – Groundwater

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS
PHONE: (732) 532-6224 FAX: (732) 532-6263
WET-CHEM - METALS - ORGANICS - FIELD SAMPLING
CERTIFICATIONS: NJDEP #13461



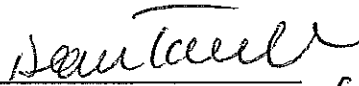
ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: Post Injections

Bldg./108

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
108MW04 (6.75')	1053501	Aqueous	08-Dec-10	12/08/10
108MW04 (7.5')	1053502	Aqueous	08-Dec-10	12/08/10

ANALYSIS:
FORT MONMOUTH ENVIRONMENTAL TESTING LAB
TAL METALS

ACCUTEST LABORATORIES
TAL METALS


Dean Tardiff/Date: 3/1/11
Laboratory Manager

CHAIN OF CUSTODY

000001



Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703

Tel (732)532-4359 Fax (732)532-6263 EMail:dean.tardiff@us.army.mil

NJDEP Certification #13461

Chain of Custody Record

[illegible]

print legibly

SAMPLE RECEIPT FORM

Date Received: 12-8-10

Work Order ID#: 10535

Site/Proj. Name: Site 108

Cooler Temp (°C): 4.0°

Received By: J. Verma
(Print name)

Sign: [Signature]

Check the appropriate box

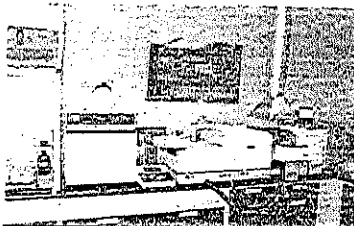
- | | | | |
|---|-----|----|-----|
| 1. Did the samples come in a cooler? | yes | no | n/a |
| 2. Were samples rec'd in good condition? | yes | no | |
| 3. Was the chain of custody filled out correctly and legibly? | yes | no | |
| 4. Was the chain of custody signed in the appropriate place? | yes | no | |
| 5. Did the labels agree with the chain of custody? | yes | no | |
| 6. Were the correct containers/preservatives used? | yes | no | |
| 7. Was a sufficient amount of sample supplied? | yes | no | |
| 8. Were air bubbles present in VOA vials? | yes | no | n/a |
| 9. Were samples received on ice? | yes | no | |
| 10. Were analyze-immediately tests perform within 15 minutes | yes | no | n/a |

Fill out the following table for each sample bottle

Lims ID	pH	Preservative	Sample ID	pH	Preservative
10535/1-2	4.2	HNO3			

Comments: _____

000003



Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703

Tel (732)532-4359 Fax (732)532-6263 EMail:dean.tardiff@us.army.mil

NJDEP Certification #13461

Chain of Custody Record

[illegible]

108MW04 LTM LOW FLOW CHART

DATE SAMPLED: 12/08/10

<u>TIME</u> (24hr mil)	<u>DTW</u> (ft)	<u>FLOW</u> (ml)	<u>pH</u> (su)	<u>TEMP</u> (°c)	<u>DO</u> (mg/L)	<u>SC</u> (us/cm)	<u>ORP</u> (mv)	<u>TURB</u> (ntu)
14:20	4.19	380	7.2	15.5	3.2	28	1	45.6
14:25	4.51	380	7.3	14.9	3.2	28	37	56.7
14:30	4.70	380	7.3	15.0	3.2	28	53	87.4
14:35	4.95	380	7.3	14.9	3.3	28	55	22.9
14:40	5.2	380	7.3	15.0	3.3	28	63	29.7
14:45	5.42	380	7.3	14.8	3.3	28	61	57.2
14:50	5.56	380	7.4	14.8	3.3	28	70	50.9
14:55	5.60	380	7.3	14.9	3.3	28	73	15.0
15:00	5.62	380	7.3	14.9	3.4	28	69	15.8
Sampled @ 15:05								
15:12	5.65	40.3	7.3	15.0	3.3	28	66	15.7

000004

US ARMY FORT MONMOUTH MONITOR WELL SAMPLING

LOCATION: 108

MW #: 04

NJDEP ID # 29-33762

NJDEP CERT. # 13461

SAMPLING CONTRACTOR: TECOM-VINNELL SERVICES

SAMPLER: PETE HENTSCHEL

DATE: 12/08/10

WEATHER: Sunny and cold.

TIDE: N/A

Sampling Conducted in
Accordance with TVS SOP
SAM-0205

Initial Readings:

Elevation of Casing Survey Mark: 4.09 ft

Depth of Well: ft

Height of water in well: ft

PID/FID Reading: 1.8 ppm

Gallons of Water to be Purged: Gal.

Formula: ht.of water x (0.163 for 2" well or 0.65 for 4" well) x 3 =

Purge Method: Peristaltic Pump/Other (Specify)

Purge Rate: Not to Exceed Well Draw Down of 0.5' Gal/Min.

Purge Data:

Start Time of Purging:

End Time of Purging:

	Initial Value	Pre-Sample	Post-Sample
pH:	su	su	su
Temperature:	(°C)	(°C)	(°C)
Specific Conductivity:	us/cm	us/cm	us/cm
ORP:	mv	mv	mv
DO:	mg/L	mg/L	mg/L
Depth to Water Post Purge:	ft		
Depth to Water Post Sampling:	ft		
Sampling Start Time:			
Sampling End Time:			

Comments:

000005

LABORATORY CHRONICLE

000006

Laboratory Chronicle

Lab ID: 10535

Site: 108

	Date	Hold Time
Date Sampled	12/08/10	NA
Receipt/Refrigeration	12/08/10	NA

Analyses

1. TAL Metals	12/10/10	6 Months
2. Arsenic	12/13/10	6 Months
3. Thallium	12/15/10	6 Months
4. Selenium	12/14/10	6 Months
5. Mercury	12/14/10	28 Days
6. TAL Metals (Accutest)	02/22/11	6 Months

000007

CONFORMANCE/ NON-CONFORMANCE SUMMARY

METALS ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY REPORT

Project: 10535
Method: 3120B

Indicate
Yes, No, N/A

1. Initial and Continuing Calibration Verifications Meet Criteria ✓
2. ICP Interference Check Sample Results Meet Criteria ✓
ICSA - data reprocessed for Cd, Pb, Ag
ICSA - OK
3. Serial Dilutions Meet Criteria No
1053203 K = 52% - Nontarget Element
4. Laboratory Control Samples Meet Criteria ✓
BS 120910-1
5. Preparation, Method and Calibration Blank Contamination ✓
If yes, list compounds and concentrations in each blank
MB 120910-1
6. Spike Sample Recoveries Meet Criteria ✓
1053203
7. Duplicates Meet Criteria ✓
1053203
8. Analysis Holding Time Met
If not met, list number of days exceeded for each sample

Additional Comments _____

Analyst: Alexander Sandhu Date: 1-5-11
Administrative
Review: Debra Tarr Date: 3/1/11

000009

FLAA/GFAA ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY
REPORT

Lab ID: 10535
Method: 3112B

Indicate
Yes, No, N/A

- | | | |
|----|--|-----|
| 1. | Initial Calibration has a correlation coefficient of 0.995 or higher | ✓ |
| 2. | Initial and Continuing Calibration Verifications Meet Criteria

_____ | ✓ |
| 3. | Laboratory Control Samples Meet Criteria

_____ | ✓ |
| 4. | Preparation, Method and Calibration Blank Contamination
If yes, list compounds and concentrations in each blank

_____ | ✓ |
| 5. | Spike Sample Recoveries Meet Criteria
<u>1053205</u>

_____ | ✓ |
| 6. | Duplicates Meet Criteria
<u>1053205</u>

_____ | ✓ |
| 7. | Analysis Holding Time Met
If not met, list number of days exceeded for each sample

_____ | ✓ |
| 8. | Over range samples are diluted within the calibration.
List samples that exceed high standard and are flagged with an
"E" (estimate).

_____ | N/A |

Additional Comments _____

Laboratory Manager: *Sam Ture* Date: 3/1/11

Akram Sandhu

1/5/11

000010

FLAA/GFAA ANALYSIS CONFORMANCE/NON-CONFORMANCE SUMMARY
REPORT

Lab ID: 10535
Method: 3112B
3113B/279.2

Indicate
Yes, No, N/A

- | | | |
|----|--|----|
| 1. | Initial Calibration has a correlation coefficient of 0.995 or higher | ✓ |
| 2. | Initial and Continuing Calibration Verifications Meet Criteria | ✓ |
| 3. | Laboratory Control Samples Meet Criteria | ✓ |
| 4. | Preparation, Method and Calibration Blank Contamination
If yes, list compounds and concentrations in each blank | ✓ |
| 5. | Spike Sample Recoveries Meet Criteria
<u>1053204</u> <u>TL = 62.7 %</u> | No |
| 6. | Duplicates Meet Criteria
<u>1053204</u> | ✓ |
| 7. | Analysis Holding Time Met
If not met, list number of days exceeded for each sample | ✓ |
| 8. | Over range samples are diluted within the calibration.
List samples that exceed high standard and are flagged with an "E" (estimate). | ✓ |

Additional Comments MS-MSD recovery for TL
indicates suspect matrix interference.

Laboratory Manager: _____

Jeantail

Date: _____

3/1/11

AkumZandhu

1/5/11

000011



2

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Fort Monmouth Environmental Testing Lab.

Job No JA68238

Site: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, F

Report Date 2/28/2011 4:57:04 PM

On 02/15/2011, 2 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 4.8 C. Samples were intact and properly preserved, unless noted below. An Accutest Job Number of JA68238 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: AQ	Batch ID: MP56902
-------------------	--------------------------

- ▣ All samples were digested within the recommended method holding time.
- ▣ All method blanks for this batch meet method specific criteria.
- ▣ Sample(s) JA68227-2MS, JA68227-2MSD, JA68227-2SDL were used as the QC samples for metals.
- ▣ RPD(s) for Serial Dilution for Arsenic, Beryllium, Cadmium, Selenium, Vanadium, Zinc are outside control limits for sample MP56902-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- ▣ MP56902-SD1 for Nickel: Serial dilution indicates possible matrix interference.

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

TAL METALS

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 10535
 Sample Received: 12/08/10
 Sample Matrix: Aqueous

Site: 108

Field ID#: Method Blank

Method of Analysis: Std. Methods 18th, Method 3120B, 3113B & 3112B
 EPA Method 279.2

TAL-METALS RESULTS SUMMARY (ug/L)

Element	Date of Analysis	Result (ug/L)	Regulatory Level (ug/L)*	R.L. (ug/L)	MDL (ug/L)
Aluminum	12/10/10	ND	200	100	13.0
Antimony	12/10/10	ND	6	10.00	4.70
Arsenic	12/13/10	ND	3	5.00	0.62
Barium	12/10/10	ND	6000	5.00	0.20
Beryllium	12/10/10	ND	1	0.500	0.40
Cadmium	12/10/10	ND	4	2.00	0.40
Calcium	12/10/10	ND	NLE	1000	93.0
Chromium	12/10/10	ND	70	5.00	0.60
Cobalt	12/10/10	ND	NLE	2.00	0.30
Copper	12/10/10	ND	1300	5.00	0.80
Iron	12/10/10	ND	300	500	132
Lead	12/10/10	ND	5	5.00	2.10
Magnesium	12/10/10	ND	NLE	1000	42.0
Manganese	12/10/10	ND	50	5.00	0.50
Mercury	12/14/10	ND	2	0.500	0.254
Nickel	12/10/10	ND	100	5.00	0.70
Potassium	12/10/10	338	NLE	1000	80.0
Selenium	12/14/10	1.49	40	20.0	1.36
Silver	12/10/10	ND	40	5.00	0.60
Sodium	12/10/10	ND	50000	5000	772
Thallium	12/15/10	0.92	2	5.00	0.53
Vanadium	12/10/10	ND	NLE	5.00	0.50
Zinc	12/10/10	ND	2000	50.00	2.50

ND = Not Detected NLE = No Limit Established, MDL = Method Detection Limit

* Higher of PQLs and Interim Criteria as per N.J.A.C. 7:9C

R.L. = Reporting limit, Estimated results between MDL and R.L.

000014

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 1053501
 Sample Received: 12/08/10
 Sample Matrix: Aqueous

Site: M-108

Field ID#: MW04 (6.75')

Method of Analysis: Std. Methods 18th, Method 3120B, 3113B & 3112B
 EPA Method 279.2

TAL-METALS RESULTS SUMMARY (ug/L)

Element	Date of Analysis	Result (ug/L)	Regulatory Level (ug/L)*	R.L. (ug/L)	MDL (ug/L)
Aluminum	12/10/10	1160	200	100	13.0
Antimony	12/10/10	ND	6	10.00	4.70
Arsenic	12/13/10	4.94	3	5.00	0.62
Barium	12/10/10	28.8	6000	5.00	0.20
Beryllium	12/10/10	ND	1	0.500	0.40
Cadmium	12/10/10	1.09	4	2.00	0.40
Calcium	12/10/10	45700	NLE	1000	93.0
Chromium	12/10/10	7.82	70	5.00	0.60
Cobalt	12/10/10	ND	NLE	2.00	0.30
Copper	12/10/10	16.8	1300	5.00	0.80
Iron	12/10/10	2930	300	500	132
Lead	12/10/10	8.76	5	5.00	2.10
Magnesium	12/10/10	2940	NLE	1000	42.0
Manganese	12/10/10	14.6	50	5.00	0.50
Mercury	12/14/10	ND	2	0.500	0.254
Nickel	12/10/10	4.04	100	5.00	0.70
Potassium	12/10/10	5530	NLE	1000	80.0
Selenium	12/14/10	2.35	40	20.0	1.36
Silver	12/10/10	ND	40	5.00	0.60
Sodium	12/10/10	7600	50000	5000	772
Thallium	12/15/10	ND	2	5.00	0.53
Vanadium	12/10/10	5.13	NLE	5.00	0.50
Zinc	12/10/10	49.6	2000	50.00	2.50

ND = Not Detected NLE = No Limit Established, MDL = Method Detection Limit

* Higher of PQLs and Interim Criteria as per N.J.A.C. 7:9C

R.L. = Reporting limit, Estimated results between MDL and R.L.

000015

Report of Analysis

U.S. Army, Fort Monmouth Environmental Laboratory

NJDEP Certification # 13461

Client: U.S. Army
 DPW, SELFM-PW-EV
 Bldg. 173
 Ft. Monmouth, NJ 07703

Lab ID #: 1053502
 Sample Received: 12/08/10
 Sample Matrix: Aqueous

Site: M-108

Field ID#: MW04 (7.5')

Method of Analysis: Std. Methods 18th, Method 3120B, 3113B & 3112B
 EPA Method 279.2

TAL-METALS RESULTS SUMMARY (ug/L)

Element	Date of Analysis	Result (ug/L)	Regulatory Level (ug/L)*	R.L. (ug/L)	MDL (ug/L)
Aluminum	12/10/10	3630	200	100	13.0
Antimony	12/10/10	5.48	6	10.00	4.70
Arsenic	12/13/10	8.77	3	5.00	0.62
Barium	12/10/10	39.4	6000	5.00	0.20
Beryllium	12/10/10	ND	1	0.500	0.40
Cadmium	12/10/10	1.35	4	2.00	0.40
Calcium	12/10/10	47200	NLE	1000	93.0
Chromium	12/10/10	23.0	70	5.00	0.60
Cobalt	12/10/10	1.14	NLE	2.00	0.30
Copper	12/10/10	48.6	1300	5.00	0.80
Iron	12/10/10	8180	300	500	132
Lead	12/10/10	26.0	5	5.00	2.10
Magnesium	12/10/10	3810	NLE	1000	42.0
Manganese	12/10/10	39.5	50	5.00	0.50
Mercury	12/14/10	ND	2	0.500	0.254
Nickel	12/10/10	7.64	100	5.00	0.70
Potassium	12/10/10	6270	NLE	1000	80.0
Selenium	12/14/10	1.80	40	20.0	1.36
Silver	12/10/10	ND	40	5.00	0.60
Sodium	12/10/10	7190	50000	5000	772
Thallium	12/15/10	ND	2	5.00	0.53
Vanadium	12/10/10	13.0	NLE	5.00	0.50
Zinc	12/10/10	118	2000	50.00	2.50

ND = Not Detected NLE = No Limit Established, MDL = Method Detection Limit

* Higher of PQLs and Interim Criteria as per N.J.A.C. 7:9C

R.L. = Reporting limit, Estimated results between MDL and R.L.

000016

**TAL
METALS
(ACCUTEST)**

Report of Analysis

Page 1 of 1

Client Sample ID: 1053501 108MW04/6.75'

Lab Sample ID: JA68238-1

Date Sampled: 12/08/10

Matrix: AQ - Ground Water

Date Received: 02/15/11

Percent Solids: n/a

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	1230	200	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Antimony	<6.0	6.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Arsenic	3.3	3.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Barium	<200	200	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Beryllium	<1.0	1.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Cadmium	<3.0	3.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Calcium	38700	5000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Chromium	<10	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Cobalt	<50	50	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Copper	18.7	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Iron	2770	100	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Lead	8.2	3.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Magnesium	<5000	5000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Manganese	15.0	15	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Nickel	<10	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Potassium	<10000	10000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Selenium	<10	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Silver	<10	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Sodium	<10000	10000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Thallium	<2.0	2.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Vanadium	<50	50	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Zinc	54.2	20	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²

(1) Instrument QC Batch: MA25856

(2) Prep QC Batch: MP56902

RL = Reporting Limit

000018

Report of Analysis

Page 1 of 1

Client Sample ID: 1053502 108MW04/7.5'

Lab Sample ID: JA68238-2

Date Sampled: 12/08/10

Matrix: AQ - Ground Water

Date Received: 02/15/11

Percent Solids: n/a

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	3080	200	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Antimony	< 6.0	6.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Arsenic	5.7	3.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Barium	< 200	200	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Beryllium	< 1.0	1.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Cadmium	< 3.0	3.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Calcium	38800	5000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Chromium	18.6	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Cobalt	< 50	50	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Copper	43.3	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Iron	7220	100	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Lead	21.3	3.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Magnesium	< 5000	5000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Manganese	37.1	15	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Nickel	< 10	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Potassium	< 10000	10000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Selenium	< 10	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Silver	< 10	10	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Sodium	< 10000	10000	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Thallium	< 2.0	2.0	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Vanadium	< 50	50	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²
Zinc	111	20	ug/l	1	02/21/11	02/22/11 ND	SW846 6010B ¹	SW846 3010A ²

(1) Instrument QC Batch: MA25856

(2) Prep QC Batch: MP56902

RL = Reporting Limit

000019

FORT MONMOUTH ENVIRONMENTAL TESTING LABORATORY

DIRECTORATE OF PUBLIC WORKS

PHONE: (732) 532-6224 FAX: (732) 532-6263

WET-CHEM - METALS - ORGANICS - FIELD SAMPLING

CERTIFICATIONS: NJDEP #13461



ANALYTICAL DATA REPORT
Fort Monmouth Environmental Laboratory
ENVIRONMENTAL DIVISION
Fort Monmouth, New Jersey
PROJECT: Glauconitic Study

M-2/Building 296

Field Sample Location	Laboratory Sample ID#	Matrix	Date and Time of Collection	Date Received
M2MW13 (10')	1053801	AQ	09-Dec-10 10:31	12/09/10
M2MW13 (18')	1053802	AQ	09-Dec-10 10:36	12/09/10
296MW06 (3.7')	1053803	AQ	09-Dec-10 11:41	12/09/10
296MW06 (12.25')	1053804	AQ	09-Dec-10 11:46	12/09/10

ANALYSIS:
FORT MONMOUTH ENVIRONMENTAL LAB.
TAL Metals

ACCUTEST LABORATORIES
TAL Metals

Dean Tardiff
Dean Tardiff/Date: 3/4/11
Laboratory Manager

METHODOLOGY SUMMARY

PARAMETER	REFERENCE
TARGET ANALYTE LIST METALS	Standard Methods, 18th ed.
Aluminum	3120B
Antimony	3120B
Arsenic	3113B
Barium	3120B
Beryllium	3120B
Cadmium	3120B
Calcium	3120B
Chromium	3120B
Cobalt	3120B
Copper	3120B
Iron	3120B
Lead	3120B
Magnesium	3120B
Manganese	3120B
Mercury	3112B
Nickel	3120B
Potassium	3120B
Selenium	3120B
Silver	3120B
Sodium	3120B
Thallium	279.3
Vanadium	3120B
Zinc	3120B

PARAMETER	REFERENCE
TARGET COMPOUND LIST ORGANICS	Federal Register 40 CFR Part 136 Appendix A
Base/Neutral and Acid Extractables by GC/MS	625
Purgeable Organics by GC/MS	624
Pesticide and PCB by GC	608

METHODOLOGY SUMMARY

PARAMETER	REFERENCE
TARGET ANALYTE LIST METALS	Standard Methods, 18th ed.
Aluminum	6010B
Antimony	6010B
Arsenic	6010B
Barium	6010B
Beryllium	6010B
Cadmium	6010B
Calcium	6010B
Chromium	6010B
Cobalt	6010B
Copper	6010B
Iron	6010B
Lead	6010B
Magnesium	6010B
Manganese	6010B
Mercury	7470A
Nickel	6010B
Potassium	6010B
Selenium	6010B
Silver	6010B
Sodium	6010B
Thallium	6010B
Vanadium	6010B
Zinc	6010B

PARAMETER	REFERENCE
TARGET COMPOUND LIST ORGANICS	Federal Register 40 CFR Part 136 Appendix A
Base/Neutral and Acid Extractables by GC/MS	625
Purgeable Organics by GC/MS	624
Pesticide and PCB by GC	608

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Fort Monmouth Environmental Testing Laboratory

Bldg. 173, SELFM-PW-EV, Fort Monmouth, NJ 07703

Tel (732)532-4359 Fax (732)532-6263 EMail:dean.tardiff@us.army.mil

NJDEP Certification #13461

Chain of Custody Record

[illegible]



2

CASE NARRATIVE / CONFORMANCE SUMMARY

Client: Fort Monmouth Environmental Testing Lab.

Job No JA68258

Site: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, F

Report Date 3/1/2011 9:53:53 AM

On 02/15/2011, 4 Sample(s), 0 Trip Blank(s) and 0 Field Blank(s) were received at Accutest Laboratories at a temperature of 4.8 C. Samples were intact and properly preserved, unless noted below. An Accutest Job Number of JA68258 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: AQ

Batch ID: MP56904

- ☐ All samples were digested within the recommended method holding time.
- ☐ All method blanks for this batch meet method specific criteria.
- ☐ Sample(s) JA68257-2MS, JA68257-2MSD, JA68257-2SDL were used as the QC samples for metals.
- ☐ RPD(s) for Serial Dilution for Arsenic, Chromium, Copper, Lead, Nickel, Vanadium, Zinc are outside control limits for sample MP56904-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

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

Laboratory Chronicle

Lab ID: 10538

Site: M-2/296

	Date	Hold Time
Date Sampled	12/09/10	NA
Receipt/Refrigeration	12/09/10	NA

Analyses

1. TAL Metals	12/13/10	6 Months
2. TAL Metals (Accutest)	02/22/11	6 Months
3. Arsenic	12/16/10	6 Months
4. Thallium	12/15/10	6 Months
5. Selenium	12/17/10	6 Months
6. Mercury	12/16/10	28 Days

**TAL
METALS
(ACCUTEST)**

Report of Analysis

Client Sample ID: 1053801 M2MW13/10'

Lab Sample ID: JA68258-1

Date Sampled: 12/09/10

Matrix: AQ - Ground Water

Date Received: 02/15/11

Percent Solids: n/a

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	<200	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Antimony	<6.0	6.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Arsenic	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Barium	<200	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Beryllium	<1.0	1.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Cadmium	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Calcium	34300	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Chromium	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Cobalt	<50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Copper	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Iron	39800	100	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Lead	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Magnesium	6710	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Manganese	177	15	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Nickel	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Potassium	<10000	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Selenium	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Silver	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Sodium	56100	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Thallium	<2.0	2.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Vanadium	<50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Zinc	37.3	20	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²

(1) Instrument QC Batch: MA25860

(2) Prep QC Batch: MP56904

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 1053802 M2MW13/18'

Lab Sample ID: JA68258-2

Matrix: AQ - Ground Water

Date Sampled: 12/09/10

Date Received: 02/15/11

Percent Solids: n/a

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	<200	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Antimony	<6.0	6.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Arsenic	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Barium	<200	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Beryllium	<1.0	1.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Cadmium	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Calcium	34600	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Chromium	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Cobalt	<50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Copper	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Iron	41400	100	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Lead	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Magnesium	6940	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Manganese	183	15	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Nickel	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Potassium	<10000	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Selenium	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Silver	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Sodium	57900	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Thallium	<2.0	2.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Vanadium	<50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Zinc	21.7	20	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²

(1) Instrument QC Batch: MA25860

(2) Prep QC Batch: MP56904

RL = Reporting Limit

000020

ACCUTEST
LABORATORIES

7 of 12

Report of Analysis

Client Sample ID:	1053803 296MW06/3.7'	Date Sampled:	12/09/10
Lab Sample ID:	JA68258-3	Date Received:	02/15/11
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Project:	Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	452	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Antimony	< 6.0	6.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Arsenic	< 3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Barium	329	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Beryllium	< 1.0	1.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Cadmium	< 3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Calcium	358000	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Chromium	< 10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Cobalt	< 50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Copper	< 10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Iron	96500	100	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Lead	< 3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Magnesium	146000	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Manganese	2760	15	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Nickel	< 10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Potassium	19800	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Selenium	< 10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Silver	< 10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Sodium	665000	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Thallium	< 2.0	2.0	ug/l	1	02/21/11	02/23/11 VC	SW846 6010B ²	SW846 3010A ³
Vanadium	< 50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³
Zinc	< 20	20	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ³

(1) Instrument QC Batch: MA25860

(2) Instrument QC Batch: MA25866

(3) Prep QC Batch: MP56904

RL = Reporting Limit

Report of Analysis

Page 1 of 1

Client Sample ID: 1053804 296MW06/12.25'

Lab Sample ID: JA68258-4

Date Sampled: 12/09/10

Matrix: AQ - Ground Water

Date Received: 02/15/11

Percent Solids: n/a

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Aluminum	326	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Antimony	<6.0	6.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Arsenic	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Barium	262	200	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Beryllium	<1.0	1.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Cadmium	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Calcium	311000	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Chromium	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Cobalt	<50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Copper	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Iron	78100	100	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Lead	<3.0	3.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Magnesium	126000	5000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Manganese	2420	15	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Nickel	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Potassium	17300	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Selenium	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Silver	<10	10	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Sodium	576000	10000	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Thallium	<2.0	2.0	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Vanadium	<50	50	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²
Zinc	<20	20	ug/l	1	02/21/11	02/22/11 GT	SW846 6010B ¹	SW846 3010A ²

(1) Instrument QC Batch: MA25860

(2) Prep QC Batch: MP56904

RL = Reporting Limit

**TAL METALS
REDUCED
PACKAGE

(ACCUTEST)**

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-FW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA25860 Units: ug/l

Time: Sample ID:	RL	IDL	11:26 ICB1 raw	final	11:43 CCB2 raw	final	12:07 CCB3 raw	final	13:16 CCB4 raw	final
Metal										
Aluminum	200	2.5	-4.4	<200	-3.8	<200	13.8	<200	-3.7	<200
Antimony	6.0	1.2	-0.30	<6.0	-0.30	<6.0	0.0	<6.0	-0.10	<6.0
Arsenic	3.0	1.2	0.50	<3.0	0.10	<3.0	0.40	<3.0	0.40	<3.0
Barium	200	.2	0.10	<200	0.10	<200	-0.30	<200	-0.20	<200
Beryllium	1.0	.2	0.10	<1.0	0.20	<1.0	-0.20	<1.0	-0.20	<1.0
Boron	100	.8								
Cadmium	3.0	.2	0.0	<3.0	0.10	<3.0	0.0	<3.0	-0.10	<3.0
Calcium	5000	11	-0.40	<5000	3.2	<5000	13.0	<5000	7.4	<5000
Chromium	10	.3	-0.10	<10	-0.10	<10	-0.20	<10	-0.20	<10
Cobalt	50	.3	0.0	<50	0.0	<50	0.0	<50	-0.10	<50
Copper	10	.3	0.10	<10	0.0	<10	0.10	<10	-0.10	<10
Iron	100	2	-0.50	<100	1.5	<100	2.6	<100	-2.8	<100
Lead	3.0	.9	0.40	<3.0	0.0	<3.0	0.20	<3.0	0.0	<3.0
Magnesium	5000	13	-6.7	<5000	-14	<5000	9.1	<5000	-11	<5000
Manganese	15	.2	0.0	<15	0.0	<15	-0.20	<15	-0.10	<15
Molybdenum	20	.7								
Nickel	10	.3	-0.10	<10	-0.10	<10	-0.30	<10	-0.20	<10
Palladium	50	1.1								
Potassium	10000	15	-8.8	<10000	15.9	<10000	3.7	<10000	24.2	<10000
Selenium	10	1.6	-0.10	<10	-0.40	<10	0.30	<10	-0.40	<10
Silicon	200	5.2								
Silver	10	.3	-0.10	<10	0.0	<10	0.0	<10	-0.10	<10
Sodium	10000	7.9	2.9	<10000	4.0	<10000	3.2	<10000	109	<10000
Strontium	10	.1								
Thallium	2.0	1.3	0.60	<2.0	0.90	<2.0	0.90	<2.0	0.30	<2.0
Tin	10	.3								
Titanium	10	.3								
Tungsten	50	11								
Vanadium	50	.2	0.0	<50	0.10	<50	-0.10	<50	-0.20	<50
Zinc	20	2.8	-0.40	<20	-0.30	<20	-0.40	<20	-0.40	<20
Zirconium	10	.5								

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

5.1.2



BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA25860 Units: ug/l

Time: Sample ID: Metal	RL	IDL	14:31 CCB5 raw	final	15:40 CCB6 raw	final	16:24 CCB7 raw	final	16:50 CCB8 raw	final
Aluminum	200	2.5	-3.9	<200	-10	<200	-8.5	<200	15.9	<200
Antimony	6.0	1.2	-0.50	<6.0	-0.10	<6.0	-0.20	<6.0	-0.20	<6.0
Arsenic	3.0	1.2	0.50	<3.0	0.10	<3.0	0.50	<3.0	0.40	<3.0
Barium	200	.2	-0.30	<200	-0.20	<200	-0.40	<200	-0.20	<200
Beryllium	1.0	.2	-0.20	<1.0	-0.20	<1.0	-0.40	<1.0	-0.20	<1.0
Boron	100	.8								
Cadmium	3.0	.2	-0.10	<3.0	-0.10	<3.0	-0.10	<3.0	0.10	<3.0
Calcium	5000	11	-2.4	<5000	-1.2	<5000	-4.3	<5000	17.1	<5000
Chromium	10	.3	-0.30	<10	0.10	<10	-0.20	<10	0.10	<10
Cobalt	50	.3	0.0	<50	-0.10	<50	0.0	<50	-0.10	<50
Copper	10	.3	-0.30	<10	-0.40	<10	-0.40	<10	-0.30	<10
Iron	100	2	-5.7	<100	-4.6	<100	-7.7	<100	4.2	<100
Lead	3.0	.9	-0.40	<3.0	0.60	<3.0	0.20	<3.0	0.0	<3.0
Magnesium	5000	13	-19	<5000	-14	<5000	-19	<5000	9.5	<5000
Manganese	15	.2	-0.20	<15	-0.10	<15	-0.30	<15	-0.10	<15
Molybdenum	20	.7								
Nickel	10	.3	-0.10	<10	-0.20	<10	-0.30	<10	-0.20	<10
Palladium	50	1.1								
Potassium	10000	15	10.0	<10000	19.6	<10000	-11	<10000	-2.5	<10000
Selenium	10	1.6	-0.20	<10	0.20	<10	0.20	<10	0.60	<10
Silicon	200	5.2								
Silver	10	.3	-0.20	<10	-0.10	<10	-0.20	<10	0.0	<10
Sodium	10000	7.9	34.8	<10000	49.0	<10000	14.8	<10000	17.7	<10000
Strontium	10	.1								
Thallium	2.0	1.3	0.50	<2.0	0.60	<2.0	-0.10	<2.0	1.0	<2.0
Tin	10	.3								
Titanium	10	.3								
Tungsten	50	11								
Vanadium	50	.2	0.0	<50	-0.10	<50	-0.10	<50	0.10	<50
Zinc	20	2.8	-0.40	<20	-0.60	<20	-0.50	<20	-0.40	<20
Zirconium	10	.5								

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

5.1.2
5

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JA68258
Account: PTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA25860 Units: ug/l

Time: Sample ID: Metal	RL	IDL	18:05 CCB9 raw	final	19:21 CCB10 raw	final	20:30 CCB11 raw	final	21:44 CCB12 raw	final
Aluminum	200	2.5	4.4	<200	3.3	<200	5.5	<200	17.3	<200
Antimony	6.0	1.2	0.10	<6.0	0.10	<6.0	0.70	<6.0	-0.20	<6.0
Arsenic	3.0	1.2	-0.10	<3.0	0.50	<3.0	0.70	<3.0	0.30	<3.0
Barium	200	.2	0.10	<200	0.20	<200	0.40	<200	0.20	<200
Beryllium	1.0	.2	0.0	<1.0	0.10	<1.0	0.20	<1.0	0.10	<1.0
Boron	100	.8								
Cadmium	3.0	.2	0.0	<3.0	0.10	<3.0	-0.10	<3.0	0.0	<3.0
Calcium	5000	11	9.9	<5000	22.3	<5000	16.6	<5000	6.2	<5000
Chromium	10	.3	-0.20	<10	0.0	<10	0.0	<10	0.0	<10
Cobalt	50	.3	-0.10	<50	0.20	<50	-0.10	<50	-0.10	<50
Copper	10	.3	-0.50	<10	-0.10	<10	-0.20	<10	0.10	<10
Iron	100	2	4.3	<100	12.7	<100*(a)	10.4	<100*(a)	29.2	<100*(b)
Lead	3.0	.9	-0.30	<3.0	-0.50	<3.0	0.10	<3.0	0.20	<3.0
Magnesium	5000	13	-4.2	<5000	4.9	<5000	-0.90	<5000	2.0	<5000
Manganese	15	.2	0.0	<15	0.20	<15	0.10	<15	0.10	<15
Molybdenum	20	.7								
Nickel	10	.3	-0.20	<10	0.0	<10	0.0	<10	-0.20	<10
Palladium	50	1.1								
Potassium	10000	15	12.4	<10000	3.5	<10000	28.0	<10000	22.5	<10000
Selenium	10	1.6	-0.20	<10	-0.10	<10	0.0	<10	0.10	<10
Silicon	200	5.2								
Silver	10	.3	-0.20	<10	-0.10	<10	-0.10	<10	-0.10	<10
Sodium	10000	7.9	58.4	<10000	54.5	<10000	306	<10000	42.4	<10000
Strontium	10	.1								
Thallium	2.0	1.3	0.10	<2.0	0.50	<2.0	0.80	<2.0	0.90	<2.0
Tin	10	.3								
Titanium	10	.3								
Tungsten	50	1.1								
Vanadium	50	.2	0.0	<50	0.10	<50	0.10	<50	0.0	<50
Zinc	20	2.8	-0.60	<20	-0.30	<20	-0.40	<20	-0.40	<20
Zirconium	10	.5								

(*) Outside of QC limits
(anr) Analyte not requested
(a) <1/10 of the action limit for this element.
(b) All reported results <RL or >100x CCB value.

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA25860 Units: ug/l

Time:			22:59		00:07		00:33	
Sample ID:			CCB13		CCB14		CCB15	
Metal	RL	IDL	raw	final	raw	final	raw	final
Aluminum	200	2.5	-2.7	<200	8.4	<200	81.9	<200*(b)
Antimony	6.0	1.2	0.0	<6.0	0.60	<500	0.10	<500
Arsenic	3.0	1.2	0.40	<3.0	0.60	<500	0.60	<500
Barium	200	.2	-0.20	<200	0.60	<1000	0.60	<1000
Beryllium	1.0	.2	-0.20	<1.0	0.70	<5.0	0.70	<5.0
Boron	100	.8						
Cadmium	3.0	.2	-0.10	<3.0	0.10	<5.0	0.20	<5.0
Calcium	5000	11	-2.8	<5000	14.0	<5000	86.3	<5000
Chromium	10	.3	-0.20	<10	0.40	<10	0.60	<10
Cobalt	50	.3	-0.10	<50	0.20	<50	0.20	<50
Copper	10	.3	-0.20	<10	0.40	<25	0.30	<25
Iron	100	2	-1.6	<100	14.5	<100*(a)	44.4	<100*(b)
Lead	3.0	.9	0.60	<3.0	-0.30	<500	0.10	<500
Magnesium	5000	13	-15	<5000	2.5	<5000	88.3	<5000
Manganese	15	.2	-0.20	<15	0.40	<15	0.60	<15
Molybdenum	20	.7						
Nickel	10	.3	-0.40	<10	0.10	<40	0.0	<40
Palladium	50	1.1						
Potassium	10000	15	-0.80	<10000	26.4	<10000	16.1	<10000
Selenium	10	1.6	0.70	<10	0.10	<500	0.10	<500
Silicon	200	5.2						
Silver	10	.3	-0.10	<10	0.10	<10	0.10	<10
Sodium	10000	7.9	12.5	<10000	23.5	<10000	26.0	<10000
Strontium	10	.1						
Thallium	2.0	1.3	0.50	<2.0	0.50	<500	1.0	<500
Tin	10	.3						
Titanium	10	.3						
Tungsten	50	11						
Vanadium	50	.2	-0.20	<50	0.40	<50	0.50	<50
Zinc	20	2.8	-0.50	<20	-0.30	<20	-0.30	<20
Zirconium	10	.5						

(*) Outside of QC limits
(anr) Analyte not requested
(a) <1/10 of the action limit for this element.
(b) All reported results <RL or >100x CCB value.



CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA25860 Units: ug/l

Time; Sample ID: ICCV Metal	11:32 ICCV1 True	Results	% Rec
Aluminum	40000	39100	97.8
Antimony	2000	1990	99.5
Arsenic	2000	1990	99.5
Barium	2000	2000	100.0
Beryllium	2000	2020	101.0
Boron			
Cadmium	2000	1990	99.5
Calcium	40000	39900	99.8
Chromium	2000	2010	100.5
Cobalt	2000	2030	101.5
Copper	2000	1950	97.5
Iron	40000	40300	100.8
Lead	2000	1990	99.5
Magnesium	40000	39400	98.5
Manganese	2000	2050	102.5
Molybdenum			
Nickel	2000	2000	100.0
Palladium			
Potassium	40000	39000	97.5
Selenium	2000	1990	99.5
Silicon			
Silver	250	240	96.0
Sodium	40000	39400	98.5
Strontium			
Thallium	2000	2020	101.0
Tin			
Titanium			
Tungsten			
Vanadium	2000	1970	98.5
Zinc	2000	2030	101.5
Zirconium			

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

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CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA02221M2.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/22/11
Run ID: MA25860

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

Time:	Sample ID:	ICV	11:17 ICV1		CCV	12:01 CCV2		CCV	13:10 CCV3	
Metal		True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum		5000	4880	97.6	40000	39400	98.5	40000	39700	99.3
Antimony		1000	1010	101.0	2000	1990	99.5	2000	2000	100.0
Arsenic		1000	1010	101.0	2000	2000	100.0	2000	2000	100.0
Barium		1000	992	99.2	2000	2010	100.5	2000	2020	101.0
Beryllium		1000	1020	102.0	2000	2030	101.5	2000	2050	102.5
Boron										
Cadmium		1000	1000	100.0	2000	2000	100.0	2000	2010	100.5
Calcium		5000	4900	98.0	40000	40000	100.0	40000	40600	101.5
Chromium		1000	1030	103.0	2000	2040	102.0	2000	2050	102.5
Cobalt		1000	1050	105.0	2000	2040	102.0	2000	2050	102.5
Copper		1000	1000	100.0	2000	2000	100.0	2000	1970	98.5
Iron		5000	5110	102.2	40000	40300	100.8	40000	40700	101.8
Lead		1000	1000	100.0	2000	2000	100.0	2000	2010	100.5
Magnesium		5000	4780	95.6	40000	39500	98.8	40000	40200	100.5
Manganese		1000	1070	107.0*(a	2000	2090	104.5	2000	2100	105.0
Molybdenum										
Nickel		1000	1000	100.0	2000	2010	100.5	2000	2010	100.5
Palladium										
Potassium		10000	10200	102.0	40000	39200	98.0	40000	39600	99.0
Selenium		1000	990	99.0	2000	2000	100.0	2000	2000	100.0
Silicon										
Silver		500	505	101.0	250	245	98.0	250	242	96.8
Sodium		10000	9760	97.6	40000	39500	98.8	40000	39600	99.0
Strontium										
Thallium		1000	1020	102.0	2000	2030	101.5	2000	2030	101.5
Tin										
Titanium										
Tungsten										
Vanadium		1000	1020	102.0	2000	2010	100.5	2000	2010	100.5
Zinc		1000	1050	105.0	2000	2040	102.0	2000	2060	103.0
Zirconium										

(*) 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: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/22/11
Run ID: MA25860

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

Time:	14:25			15:34			16:18		
Sample ID:	CCV	CCV4		CCV	CCV5		CCV	CCV6	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	40000	39600	99.0	40000	39500	98.8	40000	40400	101.0
Antimony	2000	2010	100.5	2000	2000	100.0	2000	1990	99.5
Arsenic	2000	2020	101.0	2000	2020	101.0	2000	2000	100.0
Barium	2000	2020	101.0	2000	2020	101.0	2000	2040	102.0
Beryllium	2000	2070	103.5	2000	2070	103.5	2000	2090	104.5
Boron									
Cadmium	2000	2030	101.5	2000	2030	101.5	2000	2020	101.0
Calcium	40000	41000	102.5	40000	41100	102.8	40000	41600	104.0
Chromium	2000	2040	102.0	2000	2070	103.5	2000	2070	103.5
Cobalt	2000	2070	103.5	2000	2070	103.5	2000	2050	102.5
Copper	2000	1980	99.0	2000	1980	99.0	2000	1990	99.5
Iron	40000	40900	102.3	40000	40900	102.3	40000	41200	103.0
Lead	2000	2020	101.0	2000	2030	101.5	2000	2020	101.0
Magnesium	40000	40400	101.0	40000	40400	101.0	40000	41000	102.5
Manganese	2000	2110	105.5	2000	2130	106.5	2000	2130	106.5
Molybdenum									
Nickel	2000	2020	101.0	2000	2030	101.5	2000	2020	101.0
Palladium									
Potassium	40000	39600	99.0	40000	39500	98.8	40000	40200	100.5
Selenium	2000	2020	101.0	2000	2010	100.5	2000	2000	100.0
Silicon									
Silver	250	243	97.2	250	245	98.0	250	245	98.0
Sodium	40000	39700	99.3	40000	39700	99.3	40000	39900	99.8
Strontium									
Thallium	2000	2040	102.0	2000	2050	102.5	2000	2040	102.0
Tin									
Titanium									
Tungsten									
Vanadium	2000	2010	100.5	2000	2020	101.0	2000	2030	101.5
Zinc	2000	2090	104.5	2000	2100	105.0	2000	2090	104.5
Zirconium									

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

5.1.4
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CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA25860 Units: ug/l

Time:	16:44			17:59			19:15		
Sample ID:	CCV	CCV7		CCV	CCV8		CCV	CCV9	
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	40000	39500	98.8	40000	40100	100.3	40000	40200	100.5
Antimony	2000	2000	100.0	2000	1990	99.5	2000	2010	100.5
Arsenic	2000	2020	101.0	2000	2010	100.5	2000	2020	101.0
Barium	2000	2020	101.0	2000	2030	101.5	2000	2040	102.0
Beryllium	2000	2070	103.5	2000	2080	104.0	2000	2080	104.0
Boron									
Cadmium	2000	2030	101.5	2000	2030	101.5	2000	2040	102.0
Calcium	40000	41200	103.0	40000	41600	104.0	40000	41400	103.5
Chromium	2000	2080	104.0	2000	2090	104.5	2000	2090	104.5
Cobalt	2000	2070	103.5	2000	2070	103.5	2000	2070	103.5
Copper	2000	2000	100.0	2000	2000	100.0	2000	2000	100.0
Iron	40000	41000	102.5	40000	41400	103.5	40000	41300	103.3
Lead	2000	2030	101.5	2000	2050	102.5	2000	2060	103.0
Magnesium	40000	40600	101.5	40000	41000	102.5	40000	40800	102.0
Manganese	2000	2130	106.5	2000	2130	106.5	2000	2130	106.5
Molybdenum									
Nickel	2000	2030	101.5	2000	2060	103.0	2000	2070	103.5
Palladium									
Potassium	40000	39400	98.5	40000	40000	100.0	40000	40000	100.0
Selenium	2000	2010	100.5	2000	2000	100.0	2000	2010	100.5
Silicon									
Silver	250	248	99.2	250	248	99.2	250	248	99.2
Sodium	40000	39700	99.3	40000	40000	100.0	40000	40100	100.3
Strontium									
Thallium	2000	2050	102.5	2000	2060	103.0	2000	2080	104.0
Tin									
Titanium									
Tungsten									
Vanadium	2000	2030	101.5	2000	2040	102.0	2000	2040	102.0
Zinc	2000	2100	105.0	2000	2100	105.0	2000	2110	105.5
Zirconium									

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

5.1.4



CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA02221M2.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/22/11
Run ID: MA25860

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

Time:	20:24	21:38	22:53
Sample ID:	CCV	CCV11	CCV12
Metal	True	Results % Rec	True Results % Rec
Aluminum	40000	40400 101.0	40000 40900 102.3
Antimony	2000	2010 100.5	2000 2020 101.0
Arsenic	2000	2020 101.0	2000 2030 101.5
Barium	2000	2060 103.0	2000 2070 103.5
Beryllium	2000	2090 104.5	2000 2100 105.0
Boron			
Cadmium	2000	2040 102.0	2000 2040 102.0
Calcium	40000	41500 103.8	40000 41900 104.8
Chromium	2000	2110 105.5	2000 2120 106.0
Cobalt	2000	2080 104.0	2000 2080 104.0
Copper	2000	2030 101.5	2000 2020 101.0
Iron	40000	41500 103.8	40000 42000 105.0
Lead	2000	2070 103.5	2000 2090 104.5
Magnesium	40000	41000 102.5	40000 41600 104.0
Manganese	2000	2150 107.5	2000 2140 107.0
Molybdenum			
Nickel	2000	2080 104.0	2000 2110 105.5
Palladium			
Potassium	40000	40300 100.8	40000 40700 101.8
Selenium	2000	2010 100.5	2000 2020 101.0
Silicon			
Silver	250	252 100.8	250 252 100.8
Sodium	40000	40500 101.3	40000 40800 102.0
Strontium			
Thallium	2000	2090 104.5	2000 2110 105.5
Tin			
Titanium			
Tungsten			
Vanadium	2000	2070 103.5	2000 2080 104.0
Zinc	2000	2110 105.5	2000 2110 105.5
Zirconium			

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

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/22/11
Run ID: MA25860

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

Time:	00:01			00:27		
Sample ID:	CCV	CCV13		CCV	CCV14	
Metal	True	Results	% Rec	True	Results	% Rec
Aluminum	40000	40800	102.0	40000	41600	104.0
Antimony	2000	2030	101.5	2000	2020	101.0
Arsenic	2000	2040	102.0	2000	2040	102.0
Barium	2000	2070	103.5	2000	2080	104.0
Beryllium	2000	2120	106.0	2000	2150	107.5
Boron						
Cadmium	2000	2060	103.0	2000	2060	103.0
Calcium	40000	42300	105.8	40000	43200	108.0
Chromium	2000	2150	107.5	2000	2140	107.0
Cobalt	2000	2100	105.0	2000	2100	105.0
Copper	2000	2030	101.5	2000	2010	100.5
Iron	40000	42400	106.0	40000	43000	107.5
Lead	2000	2110	105.5	2000	2120	106.0
Magnesium	40000	42000	105.0	40000	42900	107.3
Manganese	2000	2170	108.5	2000	2160	108.0
Molybdenum						
Nickel	2000	2130	106.5	2000	2140	107.0
Palladium						
Potassium	40000	40700	101.8	40000	41100	102.8
Selenium	2000	2030	101.5	2000	2030	101.5
Silicon						
Silver	250	253	101.2	250	251	100.4
Sodium	40000	41000	102.5	40000	41200	103.0
Strontium						
Thallium	2000	2130	106.5	2000	2140	107.0
Tin						
Titanium						
Tungsten						
Vanadium	2000	2100	105.0	2000	2080	104.0
Zinc	2000	2130	106.5	2000	2140	107.0
Zirconium						

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

5.14
5

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP
QC Limits: 50 to 150 % Recovery

Date Analyzed: 02/22/11
Run ID: MA25860

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

Time:				11:04		11:10	
Sample ID:	CRI	CRIA	CRID	CRI1		CRID1	
Metal	True	True	True	Results	% Rec	Results	% Rec
Aluminum	200		100	200	100.0	95.4	95.4
Antimony	6.0		3.0	6.2	103.3	3.1	103.3
Arsenic	8.0	3.0	3.0	8.6	107.5	3.4	113.3
Barium	200		4.0	202	101.0	3.9	97.5
Beryllium	2.0	1.0	1.0	1.9	95.0	0.80	80.0
Boron	100		10				
Cadmium	3.0		1.0	3.0	100.0	1.0	100.0
Calcium	5000		1000	5080	101.6	1040	104.0
Chromium	10		2.0	10.0	100.0	2.1	105.0
Cobalt	50		3.0	52.4	104.8	2.8	93.3
Copper	10		2.0	9.3	93.0	1.9	95.0
Iron	100			117	117.0		
Lead	3.0		2.5	3.5	116.7	2.4	96.0
Magnesium	5000		100	4840	96.8	79.0	79.0
Manganese	15		3.0	16.5	110.0	3.3	110.0
Molybdenum	20						
Nickel	10		4.0	10.3	103.0	4.3	107.5
Palladium	50						
Potassium	10000		2000	9800	98.0	1980	99.0
Selenium	10		5.0	9.8	98.0	4.8	96.0
Silicon	200						
Silver	5.0		1.0	4.9	98.0	0.90	90.0
Sodium	10000		1000	9760	97.6	1010	101.0
Strontium	10						
Thallium	10	2.0	2.0	10.9	109.0	1.3	65.0
Tin	10						
Titanium	10						
Tungsten	50						
Vanadium	50		2.0	51.0	102.0	1.9	95.0
Zinc	20		10	21.9	109.5	10.6	106.0
Zirconium	10	10	5.0				

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

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

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: 80 to 120 % Recovery Run ID: MA25860 Units: ug/l

Time:	11:48				11:55		16:31		16:37	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	493000	98.6	505000	101.0	504000	100.8	518000	103.6
Antimony		1000	2.3		1050	105.0	3.4		1060	106.0
Arsenic		1000	2.6		1020	102.0	2.3		1040	104.0
Barium		500	-4.5		515	103.0	-4.5		525	105.0
Beryllium		500	-0.30		492	98.4	-0.30		507	101.4
Boron			-1.2		9.3		-1.2		8.6	
Cadmium		1000	0.10		1050	105.0	0.10		1070	107.0
Calcium	400000	400000	378000	94.5	377000	94.3	387000	96.8	394000	98.5
Chromium		500	0.50		497	99.4	0.60		512	102.4
Cobalt		500	1.0		468	93.6	1.1		478	95.6
Copper		500	0.10		533	106.6	0.0		539	107.8
Iron	200000	200000	177000	88.5	182000	91.0	180000	90.0	187000	93.5
Lead		1000	0.10		993	99.3	-1.0		1020	102.0
Magnesium	500000	500000	515000	103.0	515000	103.0	527000	105.4	536000	107.2
Manganese		500	-1.7		493	98.6	-1.7		511	102.2
Molybdenum		500	2.4		513	102.6	2.8		524	104.8
Nickel		1000	1.4		984	98.4	1.3		1010	101.0
Palladium		500	-7.1		543	108.6	-3.5		553	110.6
Potassium			-35		-31		-37		-54	
Selenium		1000	0.60		998	99.8	-0.80		1010	101.0
Silicon			-11		-6.2		-9.5		-6.3	
Silver		1000	1.4		1070	107.0	1.1		1090	109.0
Sodium			425		444		459		483	
Strontium			0.20		0.30		0.10		0.10	
Thallium		1000	-0.10		1020	102.0	-1.7		1030	103.0
Tin			-6.7		-7.3		-7.1		-7.5	
Titanium			3.5		3.5		3.4		3.5	
Tungsten		500	21.6		484	96.8	18.8		486	97.2
Vanadium		500	-1.8		483	96.6	-1.4		494	98.8
Zinc		1000	-3.5		904	90.4	-3.8		938	93.8
Zirconium		500	2.2		509	101.8	2.6		519	103.8

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

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

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SA022211M2.ICP Date Analyzed: 02/22/11 Methods: EPA 200.7, SW846 6010B
QC Limits: 80 to 120 % Recovery Run ID: MA25860 Units: ug/l

Time:			00:14			00:20		
Sample ID:	ICSA	ICSAB	ICSA3			ICSAB3		
Metal	True	True	Results	% Rec	Results	% Rec		
Aluminum	500000	500000	507000	101.4	529000	105.8		
Antimony		1000	4.0		1080	108.0		
Arsenic		1000	3.3		1050	105.0		
Barium		500	-4.4		531	106.2		
Beryllium		500	-0.20		516	103.2		
Boron			-1.9		7.8			
Cadmium		1000	0.0		1090	109.0		
Calcium	400000	400000	393000	98.3	403000	100.8		
Chromium		500	0.80		527	105.4		
Cobalt		500	1.0		483	96.6		
Copper		500	-0.20		544	108.8		
Iron	200000	200000	183000	91.5	192000	96.0		
Lead		1000	-0.10		1060	106.0		
Magnesium	500000	500000	537000	107.4	552000	110.4		
Manganese		500	-1.5		519	103.8		
Molybdenum		500	2.9		529	105.8		
Nickel		1000	1.3		1050	105.0		
Palladium		500	-11		556	111.2		
Potassium			-46		-36			
Selenium		1000	2.0		1020	102.0		
Silicon			-9.4		-5.2			
Silver		1000	1.7		1110	111.0		
Sodium			448		475			
Strontium			0.20		0.10			
Thallium		1000	-0.50		1070	107.0		
Tin			-7.5		-8.0			
Titanium			3.6		3.9			
Tungsten		500						
Vanadium		500	-2.1		508	101.6		
Zinc		1000	-3.3		950	95.0		
Zirconium		500						

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

5.1.6

5

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JA68258
Account: FIMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP Date Analyzed: 02/23/11 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA25866 Units: ug/l

Time: Sample ID:			10:35 ICB1		10:57 CCB2		12:07 CCB3		13:18 CCB4	
Metal	RL	IDL	raw	final	raw	final	raw	final	raw	final
Aluminum	200	7.9	anr							
Antimony	6.0	.6	anr							
Arsenic	3.0	.5	anr							
Barium	200	.2	anr							
Beryllium	1.0	.1	anr							
Boron	100	.5								
Cadmium	3.0	.1	anr							
Calcium	5000	19	anr							
Chromium	10	.4	anr							
Cobalt	50	.2	anr							
Copper	10	.7	anr							
Iron	100	2.1	anr							
Lead	3.0	.9	anr							
Magnesium	5000	14	anr							
Manganese	15	.1	anr							
Molybdenum	20	5.8								
Nickel	10	.2	anr							
Palladium	50	1.4								
Potassium	10000	16	anr							
Selenium	10	1	anr							
Silicon	200	2.7								
Silver	10	.3	anr							
Sodium	10000	14	anr							
Strontium	10	.1								
Thallium	2.0	1	0.0	<2.0	0.70	<2.0	0.20	<2.0	0.30	<2.0
Tin	10	.5	anr							
Titanium	10	.3								
Tungsten	50	4.8								
Vanadium	50	.4	anr							
Zinc	20	.7	anr							
Zirconium	10	.3								

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

BLANK RESULTS SUMMARY
Part 1 - Initial and Continuing Calibration Blanks

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP Date Analyzed: 02/23/11 Methods: EPA 200.7, SW846 6010B
QC Limits: result < RL Run ID: MA25866 Units: ug/l

Time: Sample ID:				14:30 CCB5		15:42 CCB6		16:45 CCB7		17:09 CCB8	
Metal	RL	IDL		raw	final	raw	final	raw	final	raw	final
Aluminum	200	7.9		anr							
Antimony	6.0	.6		anr							
Arsenic	3.0	.5		anr							
Barium	200	.2		anr							
Beryllium	1.0	.1		anr							
Boron	100	.5									
Cadmium	3.0	.1		anr							
Calcium	5000	19		anr							
Chromium	10	.4		anr							
Cobalt	50	.2		anr							
Copper	10	.7		anr							
Iron	100	2.1		anr							
Lead	3.0	.9		anr							
Magnesium	5000	14		anr							
Manganese	15	.1		anr							
Molybdenum	20	5.8									
Nickel	10	.2		anr							
Palladium	50	1.4									
Potassium	10000	16		anr							
Selenium	10	1		anr							
Silicon	200	2.7									
Silver	10	.3		anr							
Sodium	10000	14		anr							
Strontium	10	.1									
Thallium	2.0	1		0.60	<2.0	0.20	<2.0	0.40	<2.0	0.30	<2.0
Tin	10	.5		anr							
Titanium	10	.3									
Tungsten	50	4.8									
Vanadium	50	.4		anr							
Zinc	20	.7		anr							
Zirconium	10	.3									

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

CALIBRATION CHECK STANDARDS SUMMARY
Initial Continuing Calibration Check

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/23/11
Run ID: MA25866

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

Time:	10:47		
Sample ID:	ICCV	ICCV1	
Metal	True	Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	anr		
Barium	anr		
Beryllium	anr		
Boron			
Cadmium	anr		
Calcium	anr		
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	anr		
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Palladium			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Thallium	2000	2070	103.5
Tin	anr		
Titanium			
Tungsten			
Vanadium	anr		
Zinc	anr		
Zirconium			

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



CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/23/11
Run ID: MA25866

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

Time:		10:28		12:01		13:12			
Sample ID:	ICV	ICV1	CCV	CCV2	CCV	CCV3			
Metal	True	Results	% Rec	True	Results	% Rec	True	Results	% Rec
Aluminum	anr								
Antimony	anr								
Arsenic	anr								
Barium	anr								
Beryllium	anr								
Boron									
Cadmium	anr								
Calcium	anr								
Chromium	anr								
Cobalt	anr								
Copper	anr								
Iron	anr								
Lead	anr								
Magnesium	anr								
Manganese	anr								
Molybdenum									
Nickel	anr								
Palladium									
Potassium	anr								
Selenium	anr								
Silicon									
Silver	anr								
Sodium	anr								
Strontium									
Thallium	1000	1020	102.0	2000	2080	104.0	2000	2060	103.0
Tin	anr								
Titanium									
Tungsten									
Vanadium	anr								
Zinc	anr								
Zirconium									

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

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP Date Analyzed: 02/23/11 Methods: EPA 200.7, SW846 6010B
QC Limits: 95 to 105 % Recovery Run ID: MA25866 Units: ug/l

Time:		14:24		15:36		16:40	
Sample ID:	CCV	CCV4	CCV	CCV5	CCV	CCV6	
Metal	True	Results	% Rec	True	Results	% Rec	True
Aluminum	anr						
Antimony	anr						
Arsenic	anr						
Barium	anr						
Beryllium	anr						
Boron							
Cadmium	anr						
Calcium	anr						
Chromium	anr						
Cobalt	anr						
Copper	anr						
Iron	anr						
Lead	anr						
Magnesium	anr						
Manganese	anr						
Molybdenum							
Nickel	anr						
Palladium							
Potassium	anr						
Selenium	anr						
Silicon							
Silver	anr						
Sodium	anr						
Strontium							
Thallium	2000	2060	103.0	2000	2050	102.5	2000
Tin	anr						2050
Titanium							102.5
Tungsten							
Vanadium	anr						
Zinc	anr						
Zirconium							

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

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5.2.4
5

CALIBRATION CHECK STANDARDS SUMMARY
Initial and Continuing Calibration Checks

Login Number: JA68258

Account: FIMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP
QC Limits: 95 to 105 % Recovery

Date Analyzed: 02/23/11
Run ID: MA25866

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

Time:		17:03	
Sample ID:		CCV	
Metal		True	
		Results	% Rec
Aluminum	anr		
Antimony	anr		
Arsenic	anr		
Barium	anr		
Beryllium	anr		
Boron			
Cadmium	anr		
Calcium	anr		
Chromium	anr		
Cobalt	anr		
Copper	anr		
Iron	anr		
Lead	anr		
Magnesium	anr		
Manganese	anr		
Molybdenum			
Nickel	anr		
Palladium			
Potassium	anr		
Selenium	anr		
Silicon			
Silver	anr		
Sodium	anr		
Strontium			
Thallium	2000	2050	102.5
Tin	anr		
Titanium			
Tungsten			
Vanadium	anr		
Zinc	anr		
Zirconium			

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

5.2.4

5

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-FW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP Date Analyzed: 02/23/11 Methods: EPA 200.7, SW846 6010B
QC Limits: 50 to 150 % Recovery Run ID: MA25866 Units: ug/l

Time:	Sample ID:	CRI	CRIA	CRID	09:50	09:56	14:36		
		True	True	True	CR11	CRID1	CR12		
Metal					Results % Rec	Results % Rec	Results % Rec		
Aluminum	200			100	anr				
Antimony	6.0			3.0	anr				
Arsenic	8.0	3.0		3.0	anr				
Barium	200			4.0	anr				
Beryllium	2.0	1.0		1.0	anr				
Boron	100			10					
Cadmium	3.0			1.0	anr				
Calcium	5000			1000	anr				
Chromium	10			2.0	anr				
Cobalt	50			3.0	anr				
Copper	10			2.0	anr				
Iron	100				anr				
Lead	3.0			2.5	anr				
Magnesium	5000			100	anr				
Manganese	15			3.0	anr				
Molybdenum	20								
Nickel	10			4.0	anr				
Palladium	50								
Potassium	10000			2000	anr				
Selenium	10			5.0	anr				
Silicon	200								
Silver	5.0			1.0	anr				
Sodium	10000			1000	anr				
Strontium	10								
Thallium	10	2.0		2.0	9.1 91.0	1.5 75.0	8.7 87.0		
Tin	10				anr				
Titanium	10								
Tungsten	50								
Vanadium	50			2.0	anr				
Zinc	20			10	anr				
Zirconium	10	10		5.0					

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

LOW CALIBRATION CHECK STANDARDS SUMMARY

Login Number: JA68258

Account: PTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP
QC Limits: 50 to 150 % Recovery

Date Analyzed: 02/23/11
Run ID: MA25866

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

Time:				14:42
Sample ID:	CRI	CRIA	CRID	CRI3
Metal	True	True	True	Results % Rec
Aluminum	200		100	
Antimony	6.0		3.0	
Arsenic	8.0	3.0	3.0	
Barium	200		4.0	
Beryllium	2.0	1.0	1.0	
Boron	100		10	
Cadmium	3.0		1.0	
Calcium	5000		1000	
Chromium	10		2.0	
Cobalt	50		3.0	
Copper	10		2.0	
Iron	100			
Lead	3.0		2.5	
Magnesium	5000		100	
Manganese	15		3.0	
Molybdenum	20			
Nickel	10		4.0	
Palladium	50			
Potassium	10000		2000	
Selenium	10		5.0	
Silicon	200			
Silver	5.0		1.0	
Sodium	10000		1000	
Strontium	10			
Thallium	10	2.0	2.0	
Tin	10			
Titanium	10			
Tungsten	50			
Vanadium	50		2.0	
Zinc	20		10	
Zirconium	10	10	5.0	anr

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

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

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-FW-EV, Fort Monmouth, NJ

File ID: SB022311M1.ICP Date Analyzed: 02/23/11 Methods: EPA 200.7, SW846 6010B
QC Limits: 80 to 120 % Recovery Run ID: MA25866 Units: ug/l

Time:	11:01				11:07		16:51		16:57	
Sample ID:	ICSA	ICSAB	ICSA1		ICSAB1		ICSA2		ICSAB2	
Metal	True	True	Results	% Rec	Results	% Rec	Results	% Rec	Results	% Rec
Aluminum	500000	500000	509000	101.8	517000	103.4	520000	104.0	531000	106.2
Antimony		1000	-3.3		1070	107.0	-1.8		1060	106.0
Arsenic		1000	1.1		1050	105.0	-1.1		1030	103.0
Barium		500	-5.6		530	106.0	-5.2		516	103.2
Beryllium		500	0.10		495	99.0	0.10		508	101.6
Boron			-5.7		-6.5		-6.4		-6.5	
Cadmium		1000	1.8		1060	106.0	1.4		1050	105.0
Calcium	400000	400000	382000	95.5	378000	94.5	390000	97.5	391000	97.8
Chromium		500	2.4		509	101.8	2.7		506	101.2
Cobalt		500	4.4		482	96.4	3.5		482	96.4
Copper		500	0.50		556	111.2	0.20		515	103.0
Iron	200000	200000	181000	90.5	185000	92.5	183000	91.5	188000	94.0
Lead		1000	0.20		997	99.7	0.50		1010	101.0
Magnesium	500000	500000	502000	100.4	504000	100.8	521000	104.2	525000	105.0
Manganese		500	5.1		518	103.6	4.4		505	101.0
Molybdenum		500	8.1		535	107.0	7.4		533	106.6
Nickel		1000	5.4		1020	102.0	5.8		1010	101.0
Palladium		500	-59		478	95.6	-29		508	101.6
Potassium			-55		-81		-82		-94	
Selenium		1000	-0.50		1020	102.0	-1.1		1010	101.0
Silicon			-21		-13		-21		-13	
Silver		1000	0.50		1120	112.0	-1.0		1060	106.0
Sodium			29.5		38.3		119		97.9	
Strontium			-4.6		-4.5		-4.5		-4.6	
Thallium		1000	-3.0		1040	104.0	-1.1		1040	104.0
Tin			-6.4		-6.3		-6.0		-6.0	
Titanium			6.1		5.5		5.6		5.2	
Tungsten		500	8.6		496	99.2	-16		488	97.6
Vanadium		500	-0.90		505	101.0	-0.50		489	97.8
Zinc		1000	-2.4		939	93.9	-2.1		918	91.8
Zirconium		500	-6.6		503	100.6	-7.4		478	95.6

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

5.2.6
5

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JA68258
Account: FIMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 02/21/11

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	2.5	7.2	-0.10	<200
Antimony	6.0	1.2	1.3	0.30	<6.0
Arsenic	3.0	1.2	.92	0.10	<3.0
Barium	200	.2	.44	-0.20	<200
Beryllium	1.0	.2	.24	-0.40	<1.0
Boron	100	.8	2		
Cadmium	3.0	.2	.17	0.0	<3.0
Calcium	5000	11	9	22.3	<5000
Chromium	10	.3	.9	0.90	<10
Cobalt	50	.3	.3	-0.10	<50
Copper	10	.3	.85	2.6	<10
Iron	100	2	7.7	18.8	<100
Lead	3.0	.9	.94	0.10	<3.0
Magnesium	5000	13	17	-9.5	<5000
Manganese	15	.2	.18	0.20	<15
Molybdenum	20	.7	1.7		
Nickel	10	.3	.41	0.90	<10
Palladium	50	1.1	.77		
Potassium	10000	15	16	73.7	<10000
Selenium	10	1.6	1.5	0.80	<10
Silicon	200	5.2	9		
Silver	10	.3	.72	0.0	<10
Sodium	10000	7.9	14	198	<10000
Strontium	10	.1	.3		
Thallium	2.0	1.3	.17	-0.80	<2.0
Tin	10	.3	1.1		
Titanium	10	.3	.88		
Tungsten	50	11	6.5		
Vanadium	50	.2	.43	-0.20	<50
Zinc	20	2.8	1.7	2.1	<20
Zirconium	10	.5	4.5		

Associated samples MP56904: JA68258-1, JA68258-2, JA68258-3, JA68258-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: JA68258
Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.
Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MF56904
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

5.3.1
5

000047

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904

Methods: SW846 6010B

Matrix Type: AQUEOUS

Units: ug/l

Prep Date: 02/21/11

Metal	JA68257-2 Original MS		Spikelot MP1RW1	% Rec	QC Limits
Aluminum	761	2800	2000	102.0	75-125
Antimony	0.0	454	500	90.8	75-125
Arsenic	2.7	1850	2000	92.4	75-125
Barium	33.7	1820	2000	89.3	75-125
Beryllium	0.0	45.8	50	91.6	75-125
Boron					
Cadmium	0.0	44.0	50	88.0	75-125
Calcium	33600	56900	25000	93.2	75-125
Chromium	3.1	184	200	90.5	75-125
Cobalt	0.0	463	500	92.6	75-125
Copper	6.7	221	250	85.7	75-125
Iron	5750	6780	1000	103.0	75-125
Lead	1.1	439	500	87.6	75-125
Magnesium	7460	29900	25000	89.8	75-125
Manganese	41.4	510	500	93.7	75-125
Molybdenum					
Nickel	4.7	451	500	89.3	75-125
Palladium					
Potassium	4830	27600	25000	91.1	75-125
Selenium	0.0	1800	2000	90.0	75-125
Silicon					
Silver	0.0	46.6	50	93.2	75-125
Sodium	79600	103000	25000	93.6	75-125
Strontium					
Thallium	0.0	1730	2000	86.5	75-125
Tin					
Titanium					
Tungsten					
Vanadium	2.0	448	500	89.2	75-125
Zinc	42.1	486	500	88.8	75-125
Zirconium					

Associated samples MP56904: JA68258-1, JA68258-2, JA68258-3, JA68258-4

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

5.3.2
5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JA68258

Account: FIMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELPM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904

Methods: SW846 6010B

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

5.3.2

5

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904
Matrix Type: AQUEOUSMethods: SW846 6010B
Units: ug/l

Prep Date: 02/21/11

Metal	JA68257-2 Original MSD		Spikelot MPIRW1	% Rec	MSD RPD	QC Limit
Aluminum	761	2770	2000	100.5	1.1	20
Antimony	0.0	457	500	91.4	0.7	20
Arsenic	2.7	1860	2000	92.9	0.5	20
Barium	33.7	1830	2000	89.8	0.5	20
Beryllium	0.0	45.7	50	91.4	0.2	20
Boron						
Cadmium	0.0	44.3	50	88.6	0.7	20
Calcium	33600	57600	25000	96.0	1.2	20
Chromium	3.1	184	200	90.5	0.0	20
Cobalt	0.0	464	500	92.8	0.2	20
Copper	6.7	222	250	86.1	0.5	20
Iron	5750	6870	1000	112.0	1.3	20
Lead	1.1	440	500	87.8	0.2	20
Magnesium	7460	30100	25000	90.6	0.7	20
Manganese	41.4	509	500	93.5	0.2	20
Molybdenum						
Nickel	4.7	453	500	89.7	0.4	20
Palladium						
Potassium	4830	28000	25000	92.7	1.4	20
Selenium	0.0	1810	2000	90.5	0.6	20
Silicon						
Silver	0.0	46.8	50	93.6	0.4	20
Sodium	79600	106000	25000	105.6	2.9	20
Strontium						
Thallium	0.0	1730	2000	86.5	0.0	20
Tin						
Titanium						
Tungsten						
Vanadium	2.0	448	500	89.2	0.0	20
Zinc	42.1	489	500	89.4	0.6	20
Zirconium						

Associated samples MP56904: JA68258-1, JA68258-2, JA68258-3, JA68258-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

001050

5.3.2
E1

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits
(anr) Analyte not requested

5.3.2

5

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904

Methods: SW846 6010B

Matrix Type: AQUEOUS

Units: ug/l

Prep Date: 02/21/11

Metal	LCS Result	Spikelot MPLCW3	% Rec	QC Limits
Aluminum	4820	5000	96.4	80-120
Antimony	496	500	99.2	80-120
Arsenic	499	500	99.8	80-120
Barium	485	500	97.0	80-120
Beryllium	512	500	102.4	80-120
Boron				
Cadmium	500	500	100.0	80-120
Calcium	5470	5500	99.5	80-120
Chromium	513	500	102.6	80-120
Cobalt	526	500	105.2	80-120
Copper	473	500	94.6	80-120
Iron	5610	5500	102.0	80-120
Lead	483	500	96.6	80-120
Magnesium	5200	5500	94.5	80-120
Manganese	534	500	106.8	80-120
Molybdenum				
Nickel	491	500	98.2	80-120
Palladium				
Potassium	9680	10000	96.8	80-120
Selenium	491	500	98.2	80-120
Silicon				
Silver	191	200	95.5	80-120
Sodium	9800	10000	98.0	80-120
Strontium				
Thallium	480	500	96.0	80-120
Tin				
Titanium				
Tungsten				
Vanadium	507	500	101.4	80-120
Zinc	520	500	104.0	80-120
Zirconium				

Associated samples MP56904: JA68258-1, JA68258-2, JA68258-3, JA68258-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904

Methods: SW846 6010B

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

5.3.3



SERIAL DILUTION RESULTS SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904
Matrix Type: AQUEOUS

Methods: SW846 6010B
Units: ug/l

Prep Date: 02/21/11

Metal	JA68257-2		%DIF	QC Limits
	Original	SDL 1:5		
Aluminum	761	734	3.5	0-10
Antimony	0.00	0.00	NC	0-10
Arsenic	2.70	0.00	100.0 (a)	0-10
Barium	33.7	33.0	2.1	0-10
Beryllium	0.00	0.00	NC	0-10
Boron				
Cadmium	0.00	0.00	NC	0-10
Calcium	33600	33700	0.3	0-10
Chromium	3.10	2.00	35.5 (a)	0-10
Cobalt	0.00	0.00	NC	0-10
Copper	6.70	11.6	73.1 (a)	0-10
Iron	5750	5730	0.3	0-10
Lead	1.10	0.00	100.0 (a)	0-10
Magnesium	7460	7430	0.3	0-10
Manganese	41.4	40.9	1.2	0-10
Molybdenum				
Nickel	4.70	4.10	12.8 (a)	0-10
Palladium				
Potassium	4830	4700	2.9	0-10
Selenium	0.00	0.00	NC	0-10
Silicon				
Silver	0.00	0.00	NC	0-10
Sodium	79600	78300	1.6	0-10
Strontium				
Thallium	0.00	0.00	NC	0-10
Tin				
Titanium				
Tungsten				
Vanadium	2.00	0.00	100.0 (a)	0-10
Zinc	42.1	48.2	14.5 (a)	0-10
Zirconium				

Associated samples MP56904: JA68258-1, JA68258-2, JA68258-3, JA68258-4

Results < IDL are shown as zero for calculation purposes
(*) Outside of QC limits

5.3.4
5

SERIAL DILUTION RESULTS SUMMARY

Login Number: JA68258

Account: FTMONNJM - Fort Monmouth Environmental Testing Lab.

Project: Fort Monmouth Env Testing Lab, Building 173, SELFM-PW-EV, Fort Monmouth, NJ

QC Batch ID: MP56904

Methods: SW846 6010B

Matrix Type: AQUEOUS

Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

5.3.4



MERCURY RESULTS

000055A

Report of Analysis
U.S. Army, Fort Monmouth Environmental Laboratory
NJDEP Certification # 13461

Client: U.S. Army
DPW, SELFM-PW-EV
Bldg. 173
Ft. Monmouth, NJ 07703

Lab ID #: 10538
Sample Received: 12/09/10
Sample Matrix: Aqueous

Site: M2/Bldg. 296

Method of Analysis: Std. Methods 18th, Method 3112B

TAL-METALS RESULTS SUMMARY Mercury (ug/L)

Work Order #	Sample Location	Date of Analysis	Result (ug/L)	Regulatory Level (ug/L)*	R.L. (ug/L)	MDL (ug/L)
1053801	M2MW13 (10')	12/16/10	ND	2	0.500	0.254
1053802	M2MW13 (18')	12/16/10	ND	2	0.500	0.254
1053803	296MW06 (3.7')	12/16/10	ND	2	0.500	0.254
1053804	296MW06 (12.25')	12/16/10	ND	2	0.500	0.254
	Method Blank	12/16/10	ND	2	0.500	0.254

ND = Not Detected MDL = Method Detection Limit

* Higher of PQLs and Interim Criteria as per N.J.A.C. 7:9C

R.L. = Reporting limit, Estimated results between MDL and R.L.

000055b

LABORATORY DELIVERABLES CHECKLIST AND NON-CONFORMANCE SUMMARY

THIS FORM MUST BE COMPLETED BY THE LABORATORY OR ENVIRONMENTAL CONSULTANT
AND ACCOMPANY ALL DATA SUBMISSIONS

The following Laboratory Deliverables Checklist and Non-Conformance Summary shall be included in the data submission. All deviations from the accepted methodology and procedures, of performance values outside acceptable ranges shall be summarized in the Non-Conformance Summary. The Technical Requirements for Site Remediation, effective June 7, 1993, provides further details. The document shall be bound and paginated, contain a table of contents, and all pages shall be legible. Incomplete data packages will be returned or held without review until the data package is completed.

It is recommended that the analytical results summary sheets listing all targeted and non-targeted compounds with the method detection limits, practical quantitation limits, and the laboratory and/or sample numbers be included in one section of the data package and in the main body of the report.

- | | | |
|-----|--|-------------------------------------|
| 1. | Cover Page, Title Page listing Lab Certification #, facility name and address, & date of report submitted. | ☒ |
| 2. | Table of Contents submitted. | ☒ |
| 3. | Summary Sheets listing analytical results for all targeted and non-targeted compounds submitted. | ☒ |
| 4. | Document paginated and legible. | ☒ |
| 5. | Chain of Custody submitted. | ☒ |
| 6. | Samples submitted to lab within 48 hours of sample collection. | ☒ |
| 7. | Methodology Summary submitted. | ☒ |
| 8. | Laboratory Chronicle and Holding Time Check submitted. | ☒ |
| 9. | Results submitted on a dry weight basis. | ☒ |
| 10. | Method Detection Limits submitted. | ☒ |
| 11. | Lab certified by NJDEP for parameters of appropriate category of parameters or a member of the USEPA CLP. | ☒ |

Laboratory Manager or Environmental Consultant's Signature

Date: 1/16/11

Laboratory Certification # 13461

*Refer to NJAC 7:26E -- Appendix A, Section IV -- Reduced Data Deliverables -- Non-USEPA/CLP
Methods for further guidance.

001056

Laboratory Authentication Statement

I certify under penalty of law, where applicable, that this laboratory meets the Laboratory Performance Standards and Quality Control requirements specified in N.J.A.C. 7:18 and 40 CFR Part 136 for Water and Wastewater Analyses and SW-846 for Solid Waste Analysis. I have personally examined the information contained in this report and to the best of my knowledge, I believe that the submitted information is true, accurate, complete and meets the above referenced standards where applicable. I am aware that there are significant penalties for purposefully submitting falsified information, including the possibility of a fine and imprisonment.


Dean Tardiff
Laboratory Manager

1/6/11
3/4/11

001057