DEPARTMENT OF THE AIR FORCE
377TH AIR BASE WING (AFGSC)

Colonel Eric H. Froehlich
377 ABW/CC
2000 Wyoming Blvd SE
Kirtland AFB NM 87117-5600

APR 12 2016

Mr. John Kieling, Bureau Chief
Hazardous Waste Bureau (HWB)
New Mexico Environment Department (NMED)
2905 Rodeo Park Road
Santa Fe, New Mexico 87505

Dear Mr. Kieling

Please find attached, *Kirtland Air Force Base Bulk Fuel Facility Investigation Derived Waste Storage Area Discharge Investigation Work Plan, Revision 1*. This letter Work Plan contains the revised proposed investigation of the Investigation Derived Waste (IDW) Storage Area where groundwater monitoring well development and purge water was discharged to the soil surface. The objective is to characterize potential contamination in the soil. This Work Plan responds to deficiencies # 2-4 in NMED's Notice of Deficiency dated February 18, 2016. Response to the first deficiency is provided below.

Deficiency:

The NMED notified the Permittee that a discharge permit was required for groundwater monitoring purge water in five letters dated: November 23, 2010; April 8, 2011; May 24, 2011; June 1, 2011; and December 22, 2014. To date, the Permittee has not provided documentation to establish the fate of the water referenced in the letters. If the purge water was transported off-site for disposal, the Permittee must submit a separate letter to inform the NMED of the final disposition of the water. In the case(s) where the purge water was discharged to the ground surface, the soil investigation work plan should address the groundwater monitoring purge water, providing documentation on the fate of the water and inclusion of the discharge area in the investigation.

Response:

- The November 23, 2010 Notice of Intent (NOI) letter discussed KAFB's November 15, 2010 request to treat extracted groundwater on-site and reinject it using and injection well. Following receipt of NMED's letter requiring a DP, this approach was not pursued.

- The non-hazardous decontamination and well development water referred to in the April 8, 2011, May 24, 2011 and June 1, 2011 NMED letters is from wells KAFB-106101, KAFB-106063, and KAFB-106061. Along with approximately 190 gallons of water from KAFB-106129, this water was disposed of offsite as shown in Table 6-2 of the Q2 2012

Quarterly Report (Attachment 1A). The attached manifest (Attachment 1B) represents the disposal of this water, although the specific wells that the manifest includes are not listed on it.

- The December 22, 2014 letter addresses IDW from a number of Quarter 3, 2014 wells and one bulked water sample. The disposition of this water is described below; it is not clear why the IDW water shipped off-site or treated on-site prior to December 2014 was also included in the December 4, 2014 NOI.

    - KAFB-106006 – transported for offsite disposal on 10/28/14 per manifest 006756955FLE (Attachment 2).
    - KAFB-106008 – transported for offsite disposal on 10/28/14 per manifest 006756955FLE
    - KAFB-106028-510 – transported for offsite disposal on 10/28/14 per manifest 006756955FLE
    - KAFB-106063 – approved for surface discharge in 3/24/2015 NMED letter
    - KAFB-106065 – transported for offsite disposal on 10/28/14 per manifest 006756955FLE
    - KAFB-106094 – transported for offsite disposal on 10/28/14 per manifest 006756955FLE
    - KAFB-106210 – transported to temporary groundwater treatment system for treatment and disposal on 9/25/2015
    - 1,244 gallons of purge water from multiple wells – transported to temporary groundwater treatment system for treatment and disposal on 9/25/2015

If you have any questions or concerns, please contact Mr. L. Wayne Bitner at (505) 853-3484 or at ludie.bitner@us.af.mil, or Ms. Victoria Branson at (505) 846-6362 or at victoria.branson@us.af.mil.

ERIC H. FROEHLICH, Colonel, USAF
Commander

Attachments:
1A – Table 6-2. Wastewater Sampling and Disposal, January 2011 – March 2012
1B – Non-Hazardous Waste Manifest, Tracking # 040912-01
2 – Hazardous Waste Manifest # 006756955FLE
3 – IDW Area Investigation Work Plan

cc:
NMED-EHD (Roberts, McQuillan, Agnew)
NMED-HWB (Cobrain)
NMED (Longmire)
NMED-GWQB (Huddleson, Pullen, Hunter)

NMED-PSTB (Goerger)
NMED-OGC
SAF-IEE (Lynnes)
U.S.EPA Region 6 (King, Ellinger)
AFCEC-CZRX (Bodour)
USACE-ABQ District Office (Simpler, Goodrich, Phaneuf)
Public Info Repository (Central New Mexico Community College), Administrative Record/Information Repository (AR/IR), and File

40 CFR 270.11
DOCUMENT CERTIFICATION
APRIL 2016

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

ERIC H. FROEHLICH, Colonel, USAF
Commander, 377th Air Base Wing

This document has been approved for public release.

KIRTLAND AIR FORCE BASE
377th Air Base Wing Public Affairs

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This document has been approved for public release.

KIRTLAND AIR FORCE BASE
377th Air Base Wing Public Affairs

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April 12, 2016

Subject: Kirtland Air Force Base Bulk Fuel Facility Investigation Derived Waste Storage Area Discharge Investigation Work Plan, Revision 1

This Kirtland Air Force Base (KAFB) Bulk Fuel Facility (BFF) Investigation Derived Waste (IDW) Storage Area Discharge Investigation Work Plan has been prepared by CB&I Federal Services LLC (CB&I) for the U.S. Army Corps of Engineers (USACE), Albuquerque District, under Contract No. W912DY-10-D-0014. It describes the proposed investigation of an area of soil where groundwater monitoring (GWM) well development and pre-sampling purge water was discharged to the soil surface. The water was discharged within Solid Waste Management Unit ST-106/SS-111, above the BFF plume. Depth to groundwater ranges from 475 to 500 feet below ground surface (bgs), as measured in wells located in close proximity to the discharge location. All water was discharged to the ground surface in a manner that ensures it does not enter any watercourse.

Objective

The objective for collection of soil samples at the KAFB IDW storage area is to characterize potential contamination in the soil related to discharge of non-hazardous "Notice of Intent (NOI)" groundwater monitoring (GWM) well development and purge water collected between 2011 to early-2014. NOI water is defined as containing one or more contaminants that exceed New Mexico Groundwater Protection standards, or U. S. Environmental Protection Agency (EPA) Regional Screening Levels (RSLs, equivalent to EPA Maximum Contaminant Levels [MCLs]) if New Mexico Groundwater Protection standards do not exist for a particular constituent. Prior to Q1 2014 the New Mexico Environment Department (NMED) Ground Water Quality Bureau approved the discharge of NOI water to the ground surface in the IDW storage area (provided that it did not enter a watercourse) based on NOI packages submitted to NMED by the Air Force.

In order to order to characterize potential contamination in the soil related to these discharges, soil samples will be collected in the discharge area at various depths. The proposed investigation methods include collection and evaluation of shallow soil samples using both grab samples and direct-push technology (DPT), with analysis for constituents detected above regulatory standards for groundwater that were detected in the analyses performed on the NOI water prior to its release. Results will be reviewed with NMED to determine any further actions. The activities performed, methods implemented, and soil sampling results will be documented in a letter report.

Discharge Locations

The location of the IDW storage area is shown in Figure 1. The area is nearly flat, ranging in elevation from 5,347 to 5,345 feet above mean sea level, and sloping slightly to the south. NOI water was discharged from 55 gallon drums, 275 gallon "totes", and 1,500 gallon poly tanks located in the IDW area. Some of the discharge from the 1,500 gallon poly tanks located along the western edge of the IDW area pooled in a depression at the northwest corner of the IDW area, while discharge from the totes and drums infiltrated within the IDW area. As a result, the depression area will be investigated using DPT borings, while the remainder of the IDW area will be investigated using shallow surface soil grab samples as shown in Figure 2 (note – all IDW storage containers shown in Figure 2 have been removed from the

area). Locations of the grab samples are based on interviews with field technicians who managed the IDW area, and historic satellite photos.

It should be noted that a parking lot to the west of the IDW storage area was expanded in 2014 so that it abuts the area with no apparent runoff control. Leaking gasoline or motor oil could be flushed into the IDW area from this lot during rainstorms. Also, new fuel tanks and a fuel transfer facility were constructed just east of the IDW area in 2010-2011 and mounds of excavated soil were place in the IDW area for several months during 2011, and there is no information regarding potential contamination of this soil. Finally, a 2002 satellite photo shows trailers and vehicles in this area. Therefore, there are other potential sources of contamination to IDW storage area soils.

Exceedances in Discharged IDW

Analytes that exceeded either the New Mexico Groundwater Protection standards or EPA MCLs in discharged NOI, and the number of exceedances, are shown in Table 1.

Investigation Methodology

DPT Borings

Three DPT borings will be installed at the proposed locations shown on Figure 2 in order to define the extent of potential contamination due to pooling of the discharged NOI. Samples will be collected from several depths and submitted to an off-site laboratory for analysis of the contaminants listed in Table 1. DPT sampling will be conducted in accordance with the procedures outlined in the approved Interim Measures Work Plan (USACE, 2011b). The results of the DPT soil sample analyses will be provided to NMED in a brief report.

The methodology for DPT coring and soil sampling will follow industry standard practices. The DPT equipment will advance a continuous 2-inch-diameter, split-spoon core barrel with an acetate liner for soil sample collection. Samples will be collected from depths of 3 to 6 inches and 4.5 to 5 feet bgs. Sample collection and analytical methods are summarized in the following steps:

- Sampling equipment will be decontaminated prior to sampling activities at each borehole.

- Borehole drilling and sample collection will be conducted by advancing the sample barrel (with acetate liner). Once the barrel has reached the desired sampling depth, the sample barrel will be pulled up quickly and smoothly. The acetate liner will be removed from the sample barrel, the core will be extruded and split lengthwise, and the sample will be collected immediately.

- Photographs will be taken of each location to be sampled before any surface disturbance, and of the cores collected. Soil conditions and other field observations will be recorded during sampling on the field sampling form.

- Samples for volatiles analysis will be collected using a 5 gram Encore™ Sampler. A total of 3 Encore sampler vials per sample will be collected from specified sample depth, in accordance with the attached Encore™ sampling procedure used previously at KAFB. Then the semivolatile and metals samples will be collected adjacent to the Encore sample location using a decontaminated hand trowel or disposable scoop, in accordance with the attached Trowel/Spoon Surface Soil sampling procedure used previously at KAFB.

- Labels and custody seals will be applied by the field geologist to each sample container and the samples will placed on ice and shipped to the laboratory for analysis.

Soil Grab Sampling

Soil grab sampling will be performed in accordance with the attached Encore™ sampling procedure and Trowel/Spoon Surface Soil sampling procedure, with the exception that samples will be collected from a depth of 3 to 6 inches bgs.

- Sampling equipment will be decontaminated prior to sampling activities at each borehole.
- Grab samples will be collected from a depth of 3 to 6 inches below the surface at the locations shown in Figure 2. For each sample location, an approximate 1 foot by 1 foot area will be cleared of any surface debris, and the upper 3 inches of soil removed using a hand trowel.
- Photographs will be taken of each location to be sampled before any surface disturbance, of the cleared area to be sampled, and of the samples collected. Soil conditions and other field observations will be recorded during sampling on the field sampling form.
- Triplicate Encore™ sample vials for volatiles analysis will be collected from the middle of the excavated area immediately by pushing the samplers vertically into the soil. Then the semivolatile and metals samples will be collected adjacent to the Encore sample location using a decontaminated hand trowel or disposable scoop.
- The samples will be labeled and custody seals will be applied to each sample container and the samples will be iced and shipped to the laboratory for analysis by the field geologist.

Soil Analysis

Analyses will be performed by a U.S. Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP)-certified laboratory, using EPA (1996 and updates) methods and in accordance with the QAPjP (USACE, 2011a).

Encore samples will be kept on ice after sample collection and during shipping, and will be shipped to the DoD ELAP laboratory on the same day they are collected to meet the EPA Method SW 5035A 24-hour holding time. Upon sample receipt at the laboratory, and in accordance with Method SW 5035A preservation requirements, the Encore samples will be extruded to a vial containing distilled water and kept frozen to extend the holding time to 14 days from the sample collection date. The volatile constituents listed in Table 1 will be analyzed in accordance with EPA SW-846 Method 5035A and 8260B requirements.

Samples for analysis of the semivolatiles and metals listed in Table 1 will be collected in an 8 ounce jar and kept on ice after sample collection and during shipping. Semivolatiles will be analyzed in accordance with EPA SW-846 Method 8270D and samples for metals listed in Table 1 will be analyzed in accordance with EPA SW-846 Method 6010C.

Report

The letter report will describe the sampling activities, provide analytical results, and identify any exceedances of New Mexico industrial/occupational soil screening levels (SSLs).

References

EPA. 1996 and updates. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods, EPA Publication SW- 846, Final Update V,* Available online at http://www3.epa.gov/epawaste/hazard/testmethods/sw846/

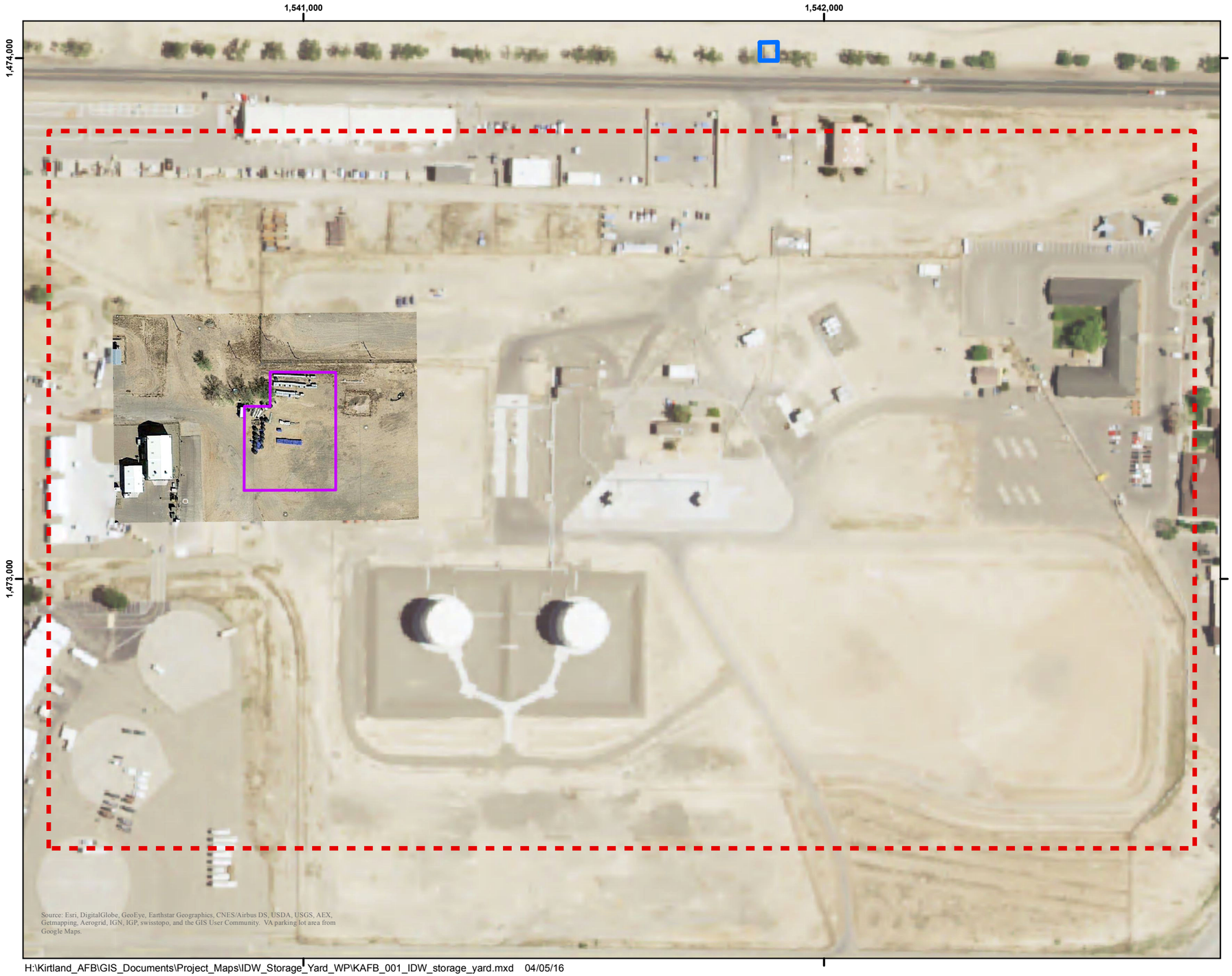
NMED. 2015. *Risk Assessment Guidance for Site Investigation and Remediation, Volume I, Tier 1: Soil Screening Guidance Technical Background Document,* Hazardous Waste Bureau and Ground Water Quality Bureau Voluntary Remediation Program, New Mexico Environment Department, Santa Fe, New Mexico, Table 6-2, TPH Screening guidelines for Potable Groundwater (GW-1), updated July 2015.

USACE. 2014. *Former Fuel Offloading Rack Excavation Work Plan, Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico.* Prepared by CB&I Federal Services LLC for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. June.

USACE. 2011a. *Quality Assurance Project Plan, Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico.* Prepared by Shaw Environmental & Infrastructure, Inc. for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. April.

USACE. 2011b. *Interim Measures Work Plan, Bulk Fuels Facility (BFF) Spill, Solid Waste Management Units ST-106 and SS-111, Kirtland Air Force Base, Albuquerque, New Mexico.* Prepared by Shaw Environmental & Infrastructure, Inc. for the USACE Albuquerque District under USACE Contract No. W912DY-10-D-0014, Delivery Order 0002. March.

FIGURES



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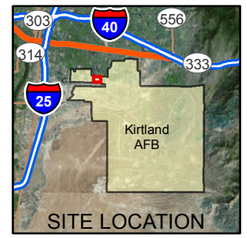
Legend

- IDW Storage Area
- 90-day Hazardous Waste Storage Area
- Bulk Fuels Facility

Satellite image showing detail of the storage yard is from maps.google.com (satellite photo dated March 7, 2014).



Revision Date: 04/05/16

N

0 100 200 400

Feet

1 inch = 200 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

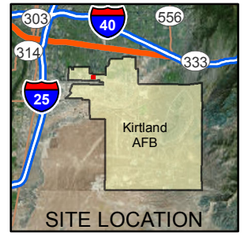
FIGURE 1

IDW STORAGE YARD

Legend

- Proposed DPT Soil Boring Location
- Proposed Shallow Grab Sample Location
- Depression
- IDW Storage Area

Satellite photo date March 7, 2014.



Revision Date: 03/31/16

N

0 20 40 80

Feet

1 inch = 40 feet

Projection : NAD83 State Plane New Mexico Central FIPS3002 Feet

BULK FUELS FACILITY
KIRTLAND AIR FORCE BASE, NEW MEXICO

FIGURE 2

Q1 2014 DISCHARGE FOOTPRINT
AND SOIL BORING LOCATIONS

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TABLE

Table 1. Summary of MCL or NM GWPS Exceedances in IDW Water Classified as "NOI" and Discharged, 2011 - 2014

Group	Analytical Method	CAS Number	Parameter	Units	MCL	NMED GWPS	Number of Samples	Number of Detections	Minimum Concentration	Maximum Concentration	Number of Detections Greater than MCL	Number of Detections Greater than NMED GWPS
EDB	8011	106-93-4	1,2-DIBROMOETHANE	µg/L	0.05	0.1	185	152	0.02	51.70	138	121
VOLATILES	8260B	106-93-4	1,2-DIBROMOETHANE	µg/L	0.05	0.1	287	92	0.00	67.20	83	81
VOLATILES	8260B	71-43-2	BENZENE	µg/L	5	10	236	101	0.24	485.00	44	34
SEMIVOLATILES	8270D	117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	µg/L	6	NA	237	39	1.20	59.10	13	0
SEMIVOLATILES	8270D	87-86-5	PENTACHLOROPHENOL	µg/L	1	5	237	13	4.00	6.60	13	10
METALS	6010C	7439-92-1	LEAD	mg/L	0.015	0.05	236	33	0.00	0.10	9	5
VOLATILES	8260B	107-06-2	1,2-DICHLOROETHANE	µg/L	5	10	236	84	0.25	6.70	6	0
VOLATILES	8260B	127-18-4	TETRACHLOROETHENE	µg/L	5	20	236	16	0.25	80.00	6	3
VOLATILES	8260B	75-09-2	METHYLENE CHLORIDE	µg/L	5	100	236	12	0.42	17.60	3	0
GEN CHEMISTRY	E300.0	10-28-6	NITROGEN, NITRATE-NITRITE	mg/L	10	10	163	40	0.16	18.70	2	2
VOLATILES	8260B	79-00-5	1,1,2-TRICHLOROETHANE	µg/L	5	10	236	1	11.40	11.40	1	1
VOLATILES	8260B	108-88-3	TOLUENE	µg/L	1000	750	236	79	0.25	1100.00	1	1
VOLATILES	8260B	79-01-6	TRICHLOROETHENE	µg/L	5	100	236	10	0.32	5.10	1	0
GEN CHEMISTRY	E300.0	16887-00-6	CHLORIDE	mg/L	NA	250	224	224	6.80	312.00	NA	1
METALS (DISSOLVED)	6010C	7439-89-6D	IRON, DISSOLVED	mg/L	NA	1	183	68	0.03	8.14	NA	18
METALS (DISSOLVED)	6010C	7439-96-5D	MANGANESE, DISSOLVED	mg/L	NA	0.2	183	163	0.00	4.33	NA	68
SEMIVOLATILES	8270D	90-12-0	1-METHYL NAPHTHALENE	µg/L	NA	30	217	28	1.19	132.00	NA	1
SEMIVOLATILES	8270D	105-67-9	2,4-DIMETHYLPHENOL	µg/L	NA	5	237	4	2.90	264.00	NA	2
SEMIVOLATILES	8270D	51-28-5	2,4-DINITROPHENOL	µg/L	NA	5	237	24	5.40	9.50	NA	23
SEMIVOLATILES	8270D	91-57-6	2-METHYLNAPHTHALENE	µg/L	NA	30	237	14	1.34	148.00	NA	1
SEMIVOLATILES	8270D	95-48-7	2-METHYLPHENOL	µg/L	NA	5	237	8	1.26	102.00	NA	2
SEMIVOLATILES	8270D	65794-96-9	3-METHYLPHENOL AND 4-METHYLPHENOL	µg/L	NA	5	237	25	1.28	64.00	NA	11
SEMIVOLATILES	8270D	534-52-1	4,6-DINITRO-2-METHYLPHENOL	µg/L	NA	5	237	1	6.50	6.50	NA	1
SEMIVOLATILES	8270D	100-02-7	4-NITROPHENOL	µg/L	NA	5	237	15	4.00	7.70	NA	12
SEMIVOLATILES	8270D	91-20-3	NAPHTHALENE	µg/L	NA	30	177	15	1.62	194.00	NA	1
SEMIVOLATILES	8270D	108-95-2	PHENOL	µg/L	NA	5	237	4	4.39	22.00	NA	3
VOLATILES	8260B	91-20-3	NAPHTHALENE	µg/L	NA	30	236	66	0.30	302.00	NA	2
VOLATILES	8260B	1330-20-7	XYLENES	µg/L	10,000	620	176	52	0.84	1510.00	0	1

Detections of analytes were compared to the more stringent value between the EPA MCL or the NMED Groundwater Protection Standard.
CAS = Chemical Abstract Service
GWPS = Ground Water Protection Standard
MCL = maximum contaminant level
mg/L = milligram per liter
NA = Not Applicable
NMED = New Mexico Environment Department
µg/L = microgram per liter

ATTACHMENTS

1. PURPOSE

The purpose of this document is to provide the methods and procedure for sampling of surface soils using trowels or spoons. Trowels or spoons can be used when matrices are composed of relatively soft and non-cemented formations and to depths of up to 12 inches into the ground surface, dependent on site conditions. Samples for Volatile Organic Compound (VOC) analysis should not be collected via trowel or spoon method. However, a trowel or spoon may be utilized to penetrate to and expose the undisturbed material at the desired depth for sampling by more applicable methods.

2. SCOPE

This procedure is applicable to all Shaw E & I projects where surface soil samples will be collected via trowel or spoon methods.

3. REFERENCES

- U.S. Army Corps of Engineers, 2001, *Requirements for the Preparation of Sampling and Analysis Plans*, Appendix C, SectionC.6, EM200-1-3, Washington, D.C.

4. DEFINITIONS

- **Trowel**—A sample collection device with a curved and pointed metal blade attached to a handle. All trace environmental samples should be collected using stainless steel blades.
- **Spoon**—A sample collection device with a round metal blade attached to a handle.
- **Surface Soil**—Soil that is removed from the surface no greater than 6 inches below grade after removing vegetation, rocks, twigs, etc.
- **Weathered Soil**—The top ⅛ to ¼ inch of soil impacted by heat from sun, rain, or foot traffic that could evaporate, dilute, or otherwise deposit contaminants from an adjacent location, thereby misrepresenting the actual soil characteristic.

5. RESPONSIBILITIES

5.1 Procedure Responsibility

The Field Sampling Discipline Lead is responsible for the maintenance, management, and revision of this procedure. Questions, comments, or suggestions regarding this technical SOP should be directed to the Field Sampling Discipline Lead.

5.2 Project Responsibility

Shaw employees performing this task, or any portion thereof, are responsible for meeting the requirements of this procedure. Shaw employees conducting technical review of task performance are also responsible for following appropriate portions of this SOP.

For those projects where the activities of this SOP are conducted, the Project Manager, or designee, is responsible for ensuring that those activities are conducted in accordance with this and other appropriate procedures. Project participants are responsible for documenting information in sufficient detail to provide objective documentation (checkprints, calculations,

reports, etc.) that the requirements of this SOP have been met. Such documentation shall be retained as project records.

6. PROCEDURE

6.1 Equipment

- Decontaminated trowel or spoon, stainless steel construction for trace environmental sampling. If samples will be collected at depth (0-6 inches), the trowel or spoon will require decontamination prior to collection of the targeted-depth sample. Alternatively, a different trowel or spoon can be used to remove the material to the targeted depth and the sample collected using a clean dedicated trowel or spoon.
- Engineers rule or stiff measuring tape
- Decontaminated stainless steel mixing bowl

6.2 Sampling

1. Don a pair of clean gloves.
2. If desired, place plastic sheeting around the targeted location to keep sampled material in place. Use a knife to cut an access hole for the sample location.
3. Remove any surficial debris (e.g. vegetation, rocks, twigs) from the sample location and surrounding area until the soil is exposed. Once exposed, the soil surface is designated as “at grade,” or 0 inches.
4. Use a trowel to scrape and remove the top 1/8 to 1/4 inch of weathered soil. (A spoon can be interchanged with trowel).
5. If collecting a sample that includes VOC analysis, collect the VOC sample aliquot first following more applicable methods.
6. With a new trowel, place the point of the blade on the ground. While holding the handle of the trowel, partially rotate the blade in a clockwise/counter-clockwise motion while pushing at a downward angle until the blade is inserted to the required depth or the blade is nearly covered. Be certain that the trowel is not inserted to a depth where the soil will touch the handle or other non-stainless steel portion of the trowel or the sampler’s hand.
7. With a prying motion lift up the trowel with soil on the blade and place soil into the stainless steel mixing bowl.
8. Repeat steps 6 and 7 until the required depth of soil is placed into the mixing bowl.
9. Measure the depth of the sample location with a rule or tape to verify the sampling depth and record in the field logbook.
10. Homogenize the non-VOC sample and transfer the sample directly into the sample container(s). Cap the sample container(s), label the containers, complete the documentation, and place the containers into the sample cooler.

7. ATTACHMENTS

None

8. FORMS

None

9. RECORDS

- Measurements recorded in Field Logbook or Field Logsheet

10. REVISION HISTORY AND APPROVAL

Revision Level Revision Date	Revision Description	Responsible Manager
00 8/28/2003	Initial issue	N/A
01 09/11/2006	Updated template and numbering of procedure, Section 1- Purpose had minor edits.	Guy Gallello
02 08/25/2011	Modified format only to align with Governance Management framework.	Scott Logan

1. PURPOSE

The purpose of this procedure is to provide general information about the procedure for using the Disposable EnCore® Sampler or other similar sealed-cap soil VOC sampler. These samplers are used to obtain and ship soil and clay samples for volatile organic compound (VOC) analysis, including gasoline-range organics (GRO), in accordance with SW-846 Method 5035A and other related protocols.

2. SCOPE

This procedure applies to all instances where soils require sampling and shipment for VOC analysis using no headspace methods, including samples collected from drilling cores.

This procedure should not be used if collecting samples for pre-weighed vial VOC methods.

This procedure and these types of samplers are not applicable to non-elastic soils and non-compactable materials, such as loose sand, rocky soils, and gravel. Such materials should be sampled using alternative methods.

3. REFERENCES

- U.S. Environmental Protection Agency, 1996, Method 5035A "Closed-System Purge and Trap for Volatile Organics in Soil and Waste," *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Revised December, Update IV.
- En Novative Technologies, Inc., "Disposable EnCore® Sampler Sampling Procedures—Using the EnCore® T-Handle," guide supplied with each case of samplers.

4. DEFINITIONS

- **Sealed-Cap VOC Sampler**—A single-use volumetric sampling system designed to collect, store, and deliver soil samples for VOC methods that require no headspace.
- **EnCore® Sampler**—A form of sealed-cap VOC sampler designed and marketed by En Novative Technologies, Inc., of Green Bay, WI. The cartridges come in two sizes for sample volumes of approximately 25 or 5 grams.
- **EnCore® T-Handle—**The specially machined holder for the EnCore® sampler sold separately by En Novative Technologies, Inc. The T-Handle provides the leverage needed to push the sampler into the soil, and should be used along with the sampler. In cases where a T-Handle is not available, it is possible though not recommended to grip the sampler by the sides, away from its sealing surfaces, with a pair of pliers or similar implement and push it into the soil.

5. RESPONSIBILITIES

5.1 Procedure Responsibility

The Field Sampling Discipline Lead is responsible for maintenance, management, and revision of this procedure. Questions, comments, or suggestions regarding this technical SOP should be directed to the Field Sampling Discipline Lead.

5.2 Project Responsibility

Shaw employees performing this task, or any portion thereof, are responsible for meeting the requirements of this procedure. Shaw employees conducting technical review of task performance are also responsible for following appropriate portions of this SOP. Project participants are responsible for documenting information in sufficient detail to provide objective documentation (checkprints, calculations, reports, etc.) that the requirements of this SOP have been met. Such documentation shall be retained as project records.

6. PROCEDURE

For each location where samples are collected and for each applicable field or laboratory QC sample, a total of three samples will need to be obtained, as follows:

1. Open the sealed bag containing the sampler and, if using an EnCore®, push the plunger down until the small O-ring rests against the tabs.

2. If using an EnCore®, the locking lever on the T-Handle must be depressed as the cartridge is inserted. Line up the slots on the cartridge with the locking pins in the T-Handle. Plunger end first, insert a cartridge into the T-Handle with locking tabs aligned and twist the cartridge clockwise locking it in place.

3. Prepare the surface by removing grass, sticks, and other matter to allow the sampler to penetrate the intended location.

    - For hard pan soils and clays or excavations, scrape away the top few inches of the material to expose virgin and penetrable soil/clay for sampling.
    - When sampling subsurface cores, split the core cover lengthwise or push the core from the coring tube to expose the core and sample from points along the core.

4. Insert the cartridge device into the material being sampled with a downward twisting motion until full. If using the EnCore® system, observe the appropriate hole in the T-Handle and continue to push the sampler into the material being sampled until the small O-ring on the plunger is visible in the viewing hole (5g-bottom hole, 25g-top hole).

5. Withdraw the sampling device from the medium and use a fresh tissue to wipe off excess material from the outside of the cartridge body and especially the O-rings. If soil is protruding from the tube, carefully slice it off even with the open end using a clean knife or spatula.

6. For the EnCore® system, while the cartridge is still on the T-Handle, turn the T-Handle until the cartridge is facing upward and place the cap over the cartridge with the locking arms aligned with the flat surfaces of the locking ridge. Then gently push the cap onto the cartridge with even pressure, and twist the cap maintaining downward pressure until the arms lock against the ridge. Non-EnCore® systems must be sealed according to the manufacturer's instructions.

7. Inspect the cap and seal making sure that the cap is seated over the cartridge squarely and evenly. For the EnCore® system, both arms must be locked over the ridge or an imperfect seal will result, compromising the data.

8. Remove the capped sampler from its holder.

9. For the EnCore® system, lock the plunger by rotating the plunger rod counterclockwise until the wings rest against the tabs.

10. Complete and attach the label and seal the cartridge in the provided sampler bag.

11. Repeat steps 1 through 10 for the other two cartridges needed for the sample location, collecting each cartridge from undisturbed material as close as possible to the original location.

12. Place all three cartridges in the same bag and then label the outside of the bag per the project requirements

13. Place the labeled bag into a cooler with the project-required coolant (ice or dry ice).

14. Complete all required documentation and ship to the laboratory per the project plans.

7. ATTACHMENTS

- Attachment 1, EnCore® Sampler Figures (from the En Novative Technologies, Inc. website: http://www.ennovativetech.com)

8. FORMS

None

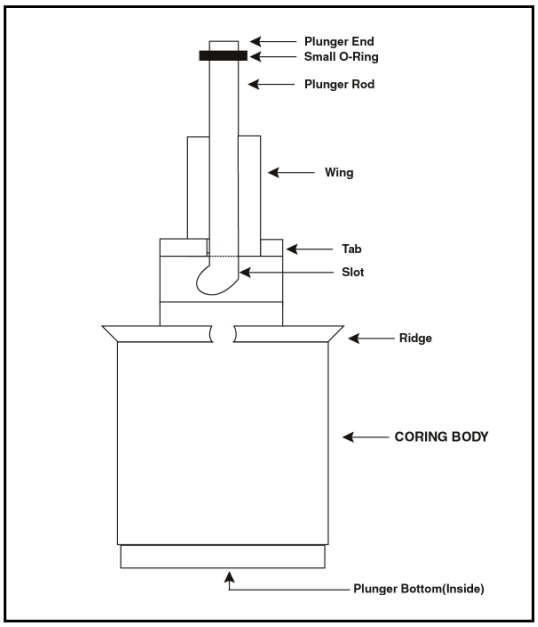
9. RECORDS

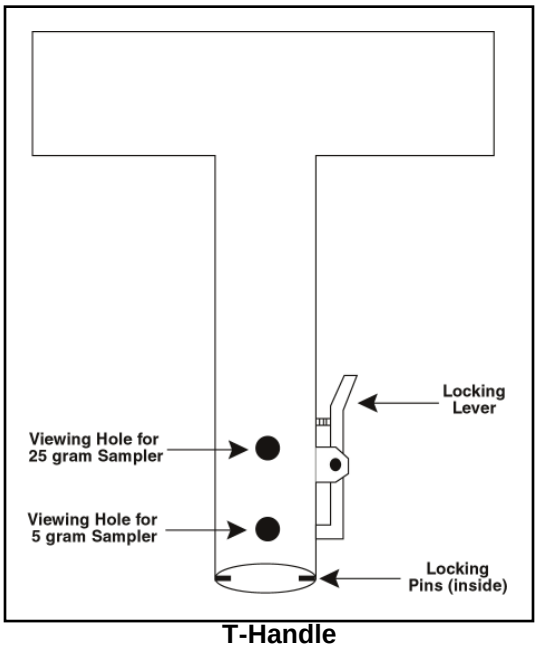
- Shipping Documentation

10. REVISION HISTORY AND APPROVAL

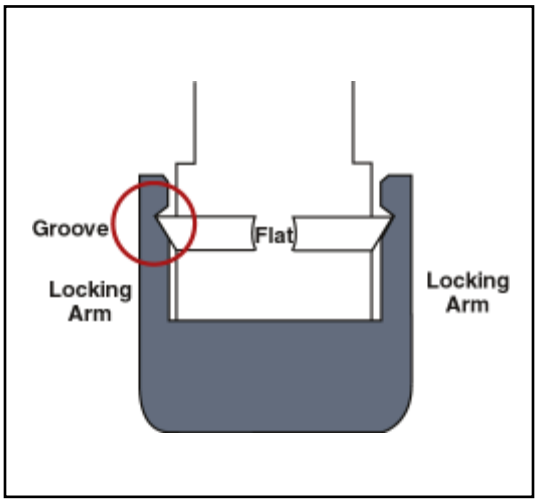
Revision Level / Revision Date	Revision Description	Responsible Manager
00 06/05/2003	Initial issue	Guy Gallello
01 01/23/2012	Modified format to align with Governance Management framework.. Slight modification to Section 5.2 Project Responsibility.	Scott Logan

Attachment 1
Encore® Sampler Figures

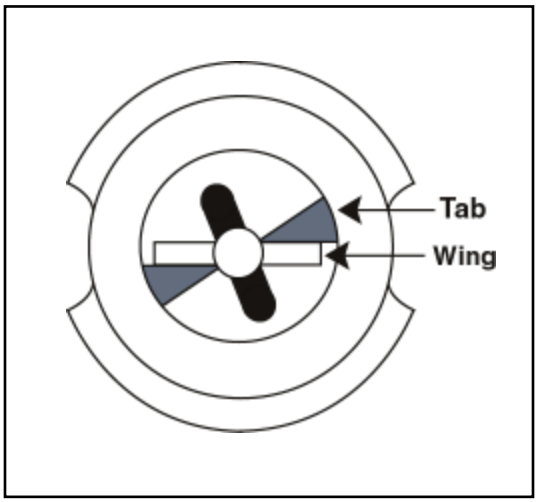




T-Handle



Sampler Properly Capped



Plunger Top view