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NAS CECIL FIELD, FL
5090.3a

GROUNDWATER SAMPLING AND ANALYSIS PLAN FOR YELLOW WATER WEAPONS
COMPOUND HIGH EXPLOSIVES MAGAZINES/HELICOPTER LANDING PAD AREA NAS
CECIL FIELD FL
10/18/1999
TETRA TECH NUS INC

**Groundwater Sampling and Analysis Plan
YWWC High Explosives Magazines/ Helicopter Landing Pad Area
Naval Air Station Cecil Field
Jacksonville, Florida**

October 18, 1999

In 1997, groundwater and soil samples were collected on behalf of Northrop-Grumman (NGC) as part of a due diligence investigation at the YWWC High Explosives Magazines (HEM)/Helicopter Landing Pad (HEL) Area. In the NGC investigation, thirteen shallow and thirteen intermediate depth temporary monitoring wells were installed, sampled, and analyzed for organic and inorganic parameters. Eighteen shallow soil samples were collected and analyzed for organic and inorganic parameters.

During the NGC investigation, arsenic was detected at a concentration greater than the FDEP criteria in one soil sample in the HEM area. Lead was detected at concentrations greater than the FDEP criteria in two wells. All other inorganics and organics were less than the criteria.

At the HEL area, no parameters were detected at concentrations greater than the FDEP criteria in soil samples. Lead was detected at concentrations greater than the FDEP criteria in ten wells. Chromium was detected at a concentration greater than the FDEP criteria in one well. Nickel was detected at a concentration greater than the FDEP criteria in one well. Vanadium was detected at concentrations greater than the FDEP criteria in four wells. Bis(2-ethylhexyl) phthalate was detected at a concentration greater than the FDEP criteria in one well. All other inorganics and organics were less than the criteria.

Nickel was detected in only one well and was not investigated further because the concentrations of the metals appear to be influenced by the suspended solids in the groundwater samples. Bis(2-ethylhexyl) phthalate was detected in only one well and was not investigated further because the compound is most likely a laboratory or field sampling contaminant.

During the NGC investigation, the sample from well 7D was analyzed for both total and dissolved metals. In that sample, total barium, chromium, lead, vanadium and zinc were detected, but only dissolved barium was detected. Thus, a significant portion of total metals is associated with suspended solids in the samples from the temporary wells. The NGC temporary wells were installed without sand packing. This observation appears to be consistent with the observations made at Building 900 and Building 68 by NGC.

Recent groundwater sampling and analysis in this area consisted on installation of two permanent monitoring wells with groundwater samples analysis for lead, chromium, and vanadium. One well each was installed in the area of the high explosives magazine and in the helicopter landing pad area. The objective of these activities was to confirm the results of the NGC investigation.

Groundwater sampling at the newly installed wells indicated exceedances of criteria for chromium, lead, and vanadium in unfiltered samples. An evaluation of groundwater flow directions and existing groundwater inorganic analytical results for wells in this area was conducted to assess the need for additional wells. Groundwater flow direction information was obtained from the Due Diligence Assessment of Environmental Concerns – YWW Compound (Golder Associates, 1998) (Figures 4 and 5). Groundwater exceedances are presented in Figure 1.

This investigation involves the resampling of the two newly installed permanent monitoring wells (CEF-HEM-01S and CEF-HEL-01S) and the two existing permanent wells (CEF-615-1S and CEF-639-1S). The groundwater will be sampled using low-flow techniques. Unfiltered and filtered samples will be collected from each well with dissolved metals samples to be filtered through a 1-micron filter.

Sampling activities and procedures described in this Work Plan will be performed in accordance with the U.S. EPA Region 4 Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) and the Base-Wide Generic Work Plan for Naval Air Station (NAS) Cecil Field.

Specifically, the Base-Wide Generic Work Plan includes procedures for management of investigation-derived wastes in Volume I and standard operating procedures in the Project Operations Plan in Volume II.

Personnel protection equipment and other waste trash will not be considered hazardous and will be disposed in a municipal landfill. Such trash will be collected in a plastic bag and disposed in a suitable trash receptacle. Drill cuttings and development water shall be drummed and analyzed for disposal purposes.

Sample handling requirements, the bottleware required, preservation, and holding time requirements for the analysis proposed for this sampling event are as identified in the following table:

Analysis	Analytical Method	Bottleware	Preservation	Holding Time ⁽¹⁾
Lead, chromium, vanadium	SW-846 6010B	1-liter glass or polyethylene	HNO ₃ to pH<2, Cool to 4°C	6 months

¹ Holding times are measured from the date/time of sample collection.

Analytical results will be provided on a 14-day turn around basis.

The laboratory contracted to do this work is as follows:

ACCUTEST SOUTHEAST
 4405 Vineland Road, Suite C-15
 Orlando, Florida 32881
 Attention: Susan Gaudios
 (407) 425-5700
 Fax: (407) 425-0707

As agreed upon by the BCT, the collection of rinsate and trip blanks has been eliminated at NAS Cecil Field. In addition, field blanks will not be collected during this sampling program because there will be no decontamination of sampling equipment. In accordance with these changes, the following table summarizes the frequency and type of field Quality Assurance/Quality Control (QA/QC) samples to be collected for this sampling program.

Type of Samples	Frequency	Samples to be Collected
Field Duplicate	1/10 sample/matrix	2 1
Lab MS/MSD	1/20 samples/matrix	1 ⁽¹⁾

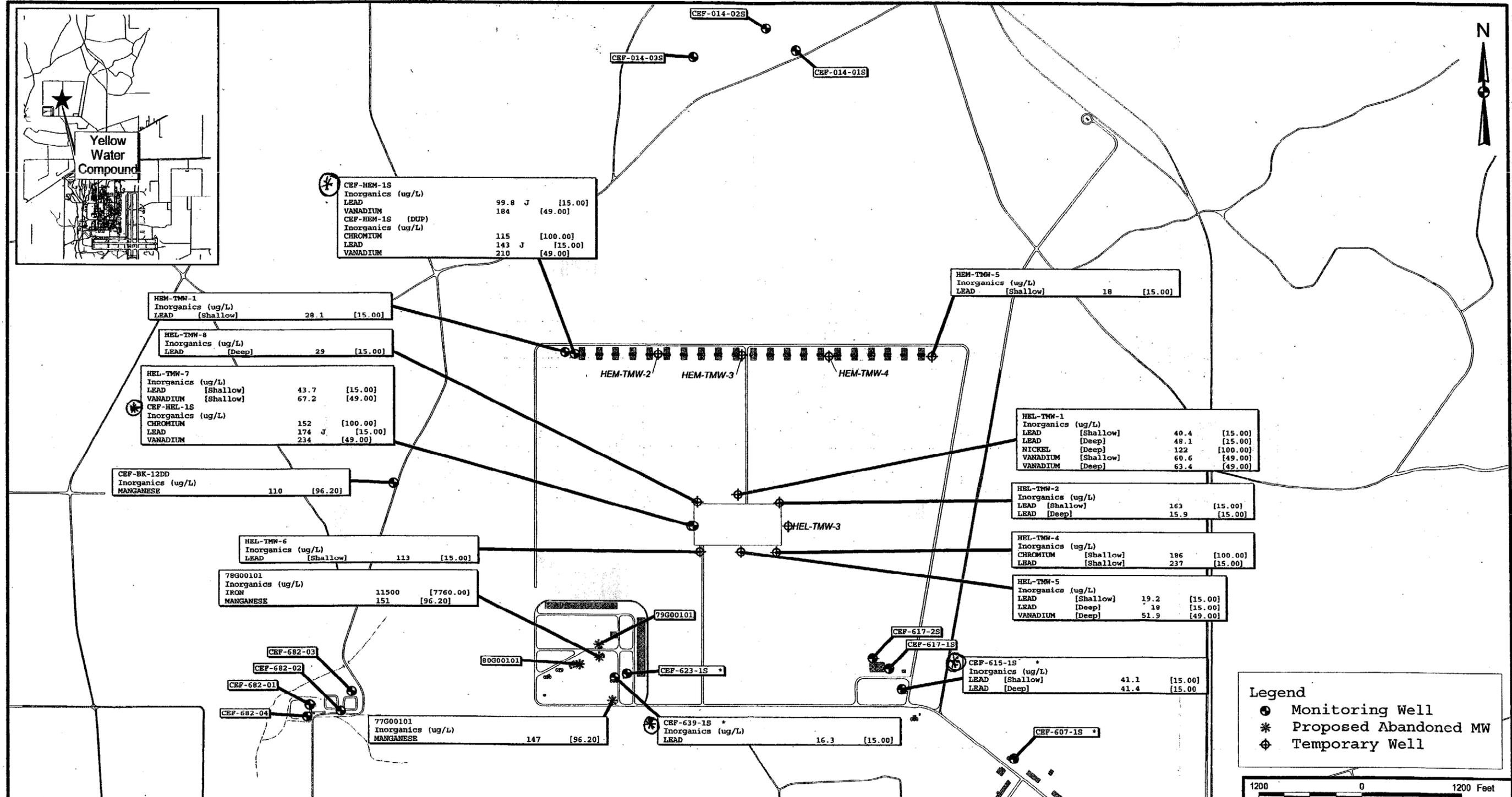
(1) MS/MSD samples are a laboratory QA/QC requirement. Separate samples are not required, only additional volume (2X).

As agreed upon by the BCT, formal data validation has been eliminated from the installation restoration program at NAS Cecil Field. However, the analytical data packages generated by the analytical laboratory will be reviewed by Tetra Tech NUS personnel to eliminate false positives and false negative results.

Table 1
Groundwater Sampling and Analysis
YWWC High Explosive Magazines/ Helicopter Pad Area

Sample Number	Sample Location	Analysis	
		Total Cr, Pb, V	Dissolved Cr, Pb, V ⁽¹⁾
CEF-HEM-01S	On the western side of the High Explosives Magazines	X	X
CEF-HEL-01S	On the western side of the Helicopter Landing Pad	X	X
CEF-615-1S	Southeast of the Helicopter Landing Pad, west of Bldg. 615	X	X
CEF-639-1S	Southwest of the Helicopter Landing Pad, near Bldg. 639	X	X

(1) - Filter through 1-micron filter



*** CEF-HEM-1S**

Inorganics (ug/L)	99.8	J	[15.00]
LEAD			
VANADIUM	184		[49.00]
CEF-HEM-1S (DUP)			
Inorganics (ug/L)	115		[100.00]
CHROMIUM			
LEAD	143	J	[15.00]
VANADIUM	210		[49.00]

HEM-TMW-1

Inorganics (ug/L)			
LEAD [Shallow]	28.1		[15.00]

HEL-TMW-8

Inorganics (ug/L)			
LEAD [Deep]	29		[15.00]

HEM-TMW-7

Inorganics (ug/L)			
LEAD [Shallow]	43.7		[15.00]
VANADIUM [Shallow]	67.2		[49.00]
CEF-HEM-1S			
Inorganics (ug/L)			
CHROMIUM	152		[100.00]
LEAD	174	J	[15.00]
VANADIUM	234		[49.00]

CEF-BK-12DD

Inorganics (ug/L)			
MANGANESE	110		[96.20]

HEL-TMW-6

Inorganics (ug/L)			
LEAD [Shallow]	113		[15.00]

78G00101

Inorganics (ug/L)			
IRON	11500		[7760.00]
MANGANESE	151		[96.20]

77G00101

Inorganics (ug/L)			
MANGANESE	147		[96.20]

*** CEF-639-1S**

Inorganics (ug/L)			
LEAD	16.3		[15.00]

HEM-TMW-5

Inorganics (ug/L)			
LEAD [Shallow]	18		[15.00]

HEL-TMW-1

Inorganics (ug/L)			
LEAD [Shallow]	40.4		[15.00]
LEAD [Deep]	48.1		[15.00]
NICKEL [Deep]	122		[100.00]
VANADIUM [Shallow]	60.6		[49.00]
VANADIUM [Deep]	63.4		[49.00]

HEL-TMW-2

Inorganics (ug/L)			
LEAD [Shallow]	163		[15.00]
LEAD [Deep]	15.9		[15.00]

HEL-TMW-4

Inorganics (ug/L)			
CHROMIUM [Shallow]	186		[100.00]
LEAD [Shallow]	237		[15.00]

HEL-TMW-5

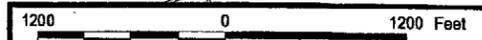
Inorganics (ug/L)			
LEAD [Shallow]	19.2		[15.00]
LEAD [Deep]	18		[15.00]
VANADIUM [Deep]	51.9		[49.00]

CEF-615-1S

Inorganics (ug/L)			
LEAD [Shallow]	41.1		[15.00]
LEAD [Deep]	41.4		[15.00]

Legend

- Monitoring Well
- * Proposed Abandoned MW
- ⊕ Temporary Well



NO.	DATE	REVISIONS	BY	CHKD	APPD	REFERENCES	DRAWN BY	DATE		GROUNDWATER RESULTS- YELLOW WATER WEAPONS COMPOUND NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NO.		
							MJJ	20Aug99			0039	APPROVED BY	DATE
											APPROVED BY	DATE	
											DRAWING NO.	FIGURE	REV.
								SCALE AS NOTED				0	