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SIXTH QUARTER GROUNDWATER MONITORING PLAN LETTER REPORT FOR BUILDING 189 TRUMAN ANNEX NAS KEY WEST FL

1/19/2000

TETRA TECH NUS

7846-7.1.5

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TtNUS/DFB-00-011/7846-7.2.3

January 19, 2000

Project Number 7846

Jorge R. Caspary, P.G.
Remedial Project Manager
Technical Review/Federal Facilities
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Reference: **Clean Contract No. N62467-94-D0888**
Contract Task Order No. 0059

Subject: **Sixth Quarter Groundwater Monitoring Plan Letter Report**
Building 189, Truman Annex, Naval Air Station,
Key West, Florida

Tetra Tech NUS, Inc. (TtNUS) is pleased to submit the Groundwater Monitoring Report for the referenced Contract Task Order (CTO). This report has been prepared for the U.S. Navy Southern Division Naval Facilities Engineering Command under CTO-059, for the Comprehensive Long-term Environmental Action Navy (CLEAN) Contract Number N62467-94-D-0888.

Monitoring Objectives. The objective of the quarterly groundwater monitoring program at Site 189 is to evaluate the contaminant plume stability and monitor product recovery efforts until cleanup levels are achieved. The monitoring program, contaminants of concern, and target concentrations are presented in the Remedial Action Plan (RAP) for Berthing Wharf Building 189 (ABB-ES, 1994). In 1997, however, the Florida Department of Environmental Protection (FDEP) updated Chapter 62-770 of the Florida Administrative Code (FAC). As a result, new chemicals of concern (CoCs) and updated groundwater cleanup target levels (GCTLs) need to be established for Site 189.

The groundwater at the site is classified as a G-III aquifer (McKenzie, 1990). As a result of this classification, the GCTLs for groundwater of low yield/poor quality, as prescribed by Chapter 62-770 FAC, are the appropriate GCTLs. Based on the first two sampling events at Site 189, TtNUS recommends the following list of CoCs and GCTLs:

CoC	GCTL
Benzo(a)anthracene	2 µg/L
Benzo(a)pyrene	2 µg/L
Indeno(123cd)pyrene	2 µg/L

Baseline Sampling. Activities and results from the baseline groundwater sampling event and first quarter of free product monitoring at NAS Key West, Site 189, are detailed in the first quarter monitoring report submitted to the FDEP on November 2, 1998.

Q A Record

First Quarter Monitoring. Activities and results from the first quarter of free product monitoring and first quarter groundwater sampling event at NAS Key West, Site 189, are detailed in the first quarter monitoring report submitted to the FDEP on November 2, 1998.

Second Quarter Monitoring. Activities and results from the second quarter of free product monitoring and second quarter groundwater sampling event at NAS Key West, Site 189, are detailed in the second quarter monitoring report submitted to the FDEP on January 18, 1999.

Third Quarter Monitoring. Activities and results from the third quarter of free product monitoring and third quarter groundwater sampling event at NAS Key West, Site 189, are detailed in the third quarter monitoring report submitted to the FDEP on April 16, 1999.

Fourth Quarter Monitoring. Activities and results from the third quarter of free product monitoring and fourth quarter groundwater sampling event at NAS Key West, Site 189, are detailed in the fourth quarter monitoring report submitted to the FDEP on July 16, 1999.

Fifth Quarter Monitoring. Activities and results from the fifth quarter of free product monitoring and fifth quarter groundwater sampling event at NAS Key West, Site 189, are detailed in the fifth quarter monitoring report submitted to the FDEP on October 18, 1999.

SIXTH QUARTER MONITORING

Free Product Monitoring. TtNUS personnel visited the site on November 25, 1999 to perform monthly free product monitoring and recovery. During the visit, monitoring wells B189-MW01 B189-MW02, B189-MW03, B189-MW10 and B189-MW11 (see Figure 1, Attachment A) were gauged using an oil/water interface probe. During the site visits, globules of free product was observed in monitoring well B189-MW-2, however the thickness was insufficient to be recorded with the oil/water interface probe. TtNUS attempted to bail the product from the well but the viscous nature of the product prevented it from entering the bailer. No reportable quantities (>0.01 feet) of free product were detected in other monitoring wells during the visit. Findings for the free product monitoring events are summarized in Table 1, Attachment B

GROUNDWATER MONITORING. On November 25, 1999 Tetra Tech, NUS, Inc. personnel collected groundwater samples from nine Site 189 monitoring wells (B189-MW01, B189-MW02, B189-MW03, B189-MW04 and B189-MW06, B189-MW07, B189-MW10, B189-MW12 and B189-MW13D). All sample activities were conducted in accordance with TtNUS, FDEP approved, Comp QAP # 980038.

Immediately prior to the collection of the groundwater samples, water level and product measurements were recorded from each site monitoring well. The water level data was used to determine purge volumes. In addition, depth-to-water measurements, along with top of casing elevations, were used to calculate groundwater elevations. Based on these elevations, the groundwater was flowing primarily to the west at the time of the sampling. Figure 2, Attachment A, depicts the groundwater elevations recorded on November 25, 1999. Depth to water measurements, top of casing elevations, and groundwater elevation data are provided in Table 2, Attachment B.

All monitoring wells were purged prior to collection groundwater samples. Purging and sampling were performed with a peristaltic pump using the low flow quiescent method. Water sampling logs, which detail the purge process, are provided in Attachment C.

Following collection of the groundwater samples, the sample bottles were packed on ice and shipped via overnight transport to PC&B Environmental Laboratories in Oviedo, Florida. The groundwater samples were analyzed for Polynuclear Aromatic Hydrocarbons (PAH). A copy of the laboratory report is provided in Attachment D.

TRPHs were not analyzed for in the groundwater samples collected during the November 1999 sampling event.

Laboratory analytical results indicate that Polynuclear Aromatic Hydrocarbons (PAH) concentrations were not detected in the any of the samples collected from monitoring wells at the site.

Conclusions. PAH compounds were not detected in any of the samples collected this quarter. Although PAH concentrations have been reduced to below laboratory detection levels, free-phased product remains in monitoring well B189-MW02. The product thickness has remained stable since the initiation of groundwater monitoring and product recovery at the site.

Recommendations. Based on the results of the six sampling events and Section 3.1 of the Site 189 RAP (ABB-ES, 1994), TtNUS recommends that a treatability study be performed at the site to evaluate air sparging and vapor extraction as a means for remediating the free-phased product at the site. Concurrent with this study, it is recommended that groundwater is sampled and analyzed for PAHs by USEPA Method 8310.

If you have any questions with regard to this submittal, please contact me at (954) 570-5885 extension 250.

Very truly yours,

Gary Braganza, P.G. 1·19·00
Florida License No. 1822

Rick Ofsanko
Task Order Manager

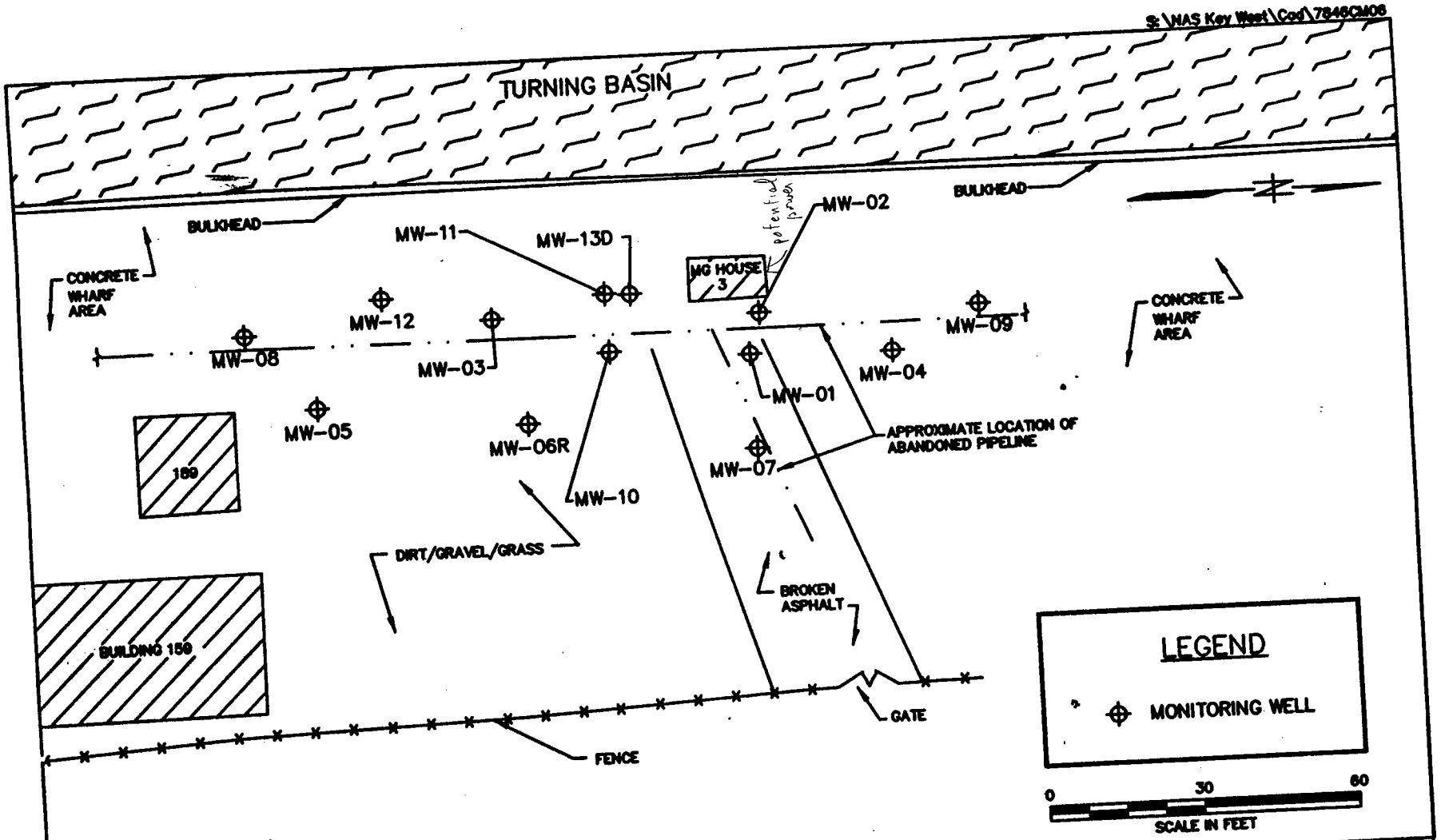
RO/ro

Enclosures

c: B. Glover, SDIV
D. Wrobleski (w/o attachments), TtNUS / DER, SDIV
A. Kendrick / File, TtNUS

ATTACHMENT A

S:\NAS Key West\Cad\7846CM06



DRAWN BY LLK	DATE 10/6/99	SITE MAP BUILDING 189 TRUMAN ANNEX NAVAL AIR STATION KEY WEST, FLORIDA	CONTRACT NO. 7846
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 1 REV. 0

FORM CADD NO. SDV_AH12.DWG - REV 0 - 1/20/98

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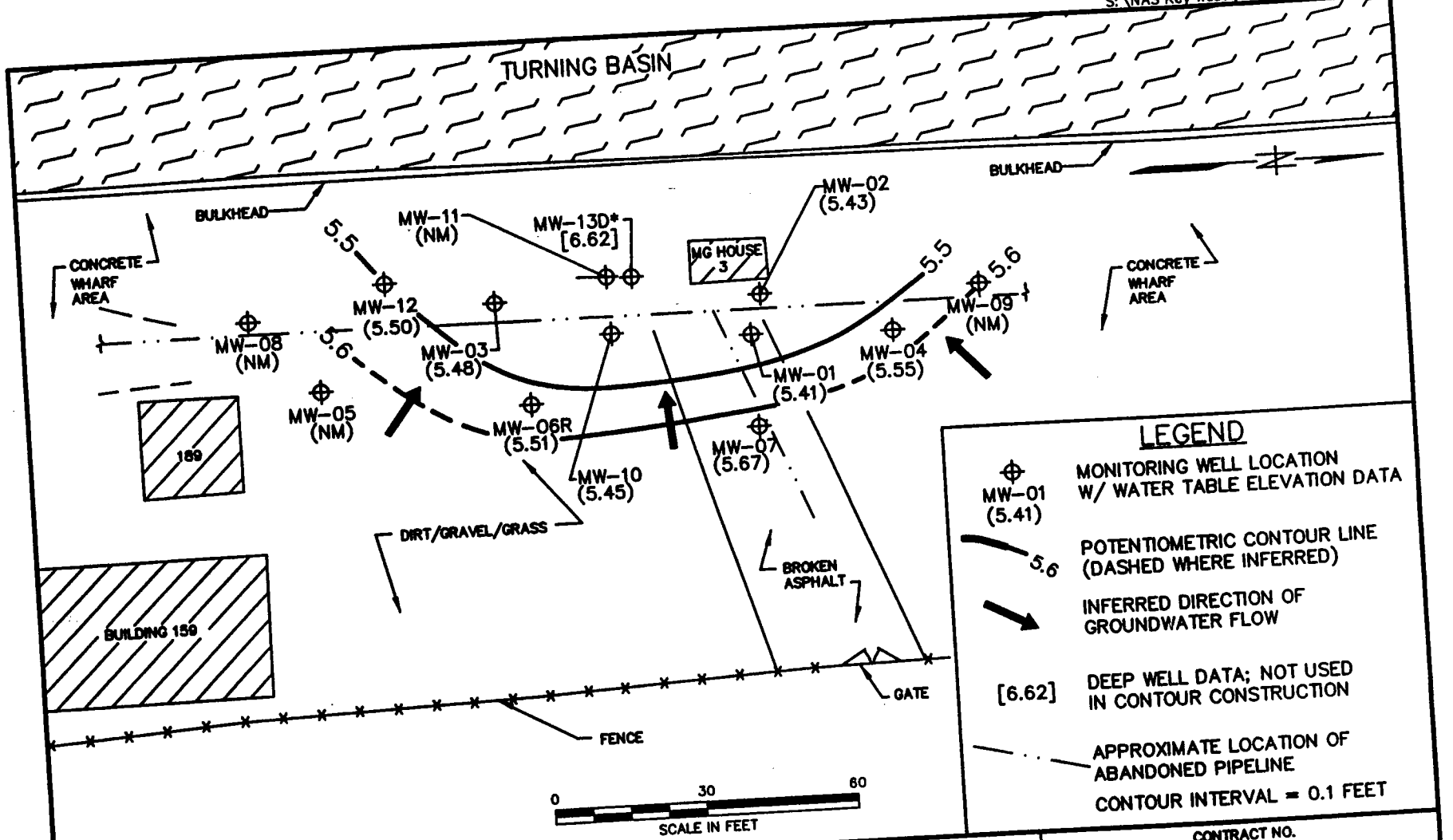

DRAWN BY LLK	DATE 12/30/99	POTENTIOMETRIC SURFACE MAP NOVEMBER 25, 1999 BUILDING 189 TRUMAN ANNEX NAVAL AIR STATION KEY WEST, FLORIDA	CONTRACT NO. 7846
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHED-AREA			APPROVED BY DATE
SCALE AS NOTED			DRAWING NO. FIGURE 2 REV. 0

FORM CADD NO. SDV_AH12.DWG - REV 0 - 1/20/98

ATTACHMENT B

TABLE 1
FREE PHASE PETROLEUM MEASUREMENTS
Site 189, Truman Annex
Naval Air Station, Key West, Florida

Field Data	B189-MW02				
	June 27, 1998	July 25, 1998	August 15, 1998	August 24, 1998	September 1, 1998
Depth to Product	unobtainable	5.65 feet	NA	NA	NA
Depth to Groundwater	5.62 feet	5.67 feet	6.02 feet	5.87 feet	5.98 feet
Appearance	sticky globules	dark and sticky	Sheen	sheen	sheen
Apparent Thickness[2]	0.10 feet	0.02 feet	<0.01 feet	<0.01 feet	<0.01 feet
Removal Amount[3]	5 gallons	8 gallons	0 gallons	0 gallons	0 gallons

Field Data	B189-MW03				
	June 27, 1998	July 25, 1998	August 15, 1998	August 24, 1998	September 1, 1998
Depth to Product	Unobtainable	NA	NA	NA	NA
Depth to Groundwater	5.85 feet	5.43 feet	6.15 feet	5.63 feet	5.75 feet
Appearance	sticky globules	Sheen	NA	sheen	sheen
Apparent Thickness	0.10 feet	<0.01 feet	NA	<0.01 feet	<0.01 feet
Removal Amount	5 gallons	0 gallons	0 gallons	0 gallons	0 gallons

NOTES:
(1) Apparent thickness is measured or estimated thickness of
(2) Removal amount is the approximate amount of free product and groundwater mixture removed from a monitoring well during free product recovery.

NA = not applicable

TABLE 1 (Continued)
FREE PHASE PETROLEUM MEASUREMENTS
Site 189, Truman Annex
Naval Air Station, Key West, Florida

Field Data	B189-MW02				
	Oct 23, 1998	Dec 2, 1998	Dec 29, 1998	Feb 23, 1999	Mar 15, 1999
Depth to Product	Unobtainable	5.65 feet	NA	NA	
Depth to Groundwater	5.62 feet	5.67 feet	6.02 feet	5.87 feet	
Appearance	sticky globules	dark and sticky	Sheen	sheen	
Apparent Thickness[2]	0.10 feet	0.02 feet	<0.01 feet	<0.01 feet	
Removal Amount[3]	5 gallons	8 gallons	0 gallons	0 gallons	

Field Data	B189-MW03				
	Oct 23, 1998	Dec 2, 1998	Dec 29, 1998	Feb 23, 1999	Mar 15, 1999
Depth to Product	No product	No product	No product	No product	
Depth to Groundwater					
Appearance					
Apparent Thickness					
Removal Amount					

NOTES:
(1) Apparent thickness is measured or estimated thickness of
(2) Removal amount is the approximate amount of free product and groundwater mixture removed from a monitoring well during free product recovery.

NA = not applicable

TABLE 1 (Continued)
FREE PHASE PETROLEUM MEASUREMENTS
Site 189, Truman Annex
Naval Air Station, Key West, Florida

Field Data	B189-MW02				
	Apr 3, 1999	May 29, 1999	June 15, 1999	Sept 1, 1999	Nov 25, 1999
Depth to Product	Unobtainable	5.65 feet	Unobtainable	Unobtainable	Unobtainable
Depth to Groundwater	5.62 feet	5.65 feet	5.32 feet	5.32 feet	5.45
Appearance	sticky globules	dark and sticky	dark and sticky	dark and sticky	Dark and sticky
Apparent Thickness(2)	<0.01 feet	<0.01 feet	<0.01 feet	<0.01 feet	<0.01 feet
Removal Amount(3)	0 gallons	0 gallons	0 gallons	0 gallons	0 gallons

Field Data	B189-MW03				
	Apr 3, 1999	May 29, 1999	June 15, 1999	Sept 1, 1999	Nov 25, 1999
Depth to Product	No product	No product	No product	No product	No product
Depth to Groundwater					
Appearance					
Apparent Thickness					
Removal Amount					

NOTES:
(1) Apparent thickness is measured or estimated thickness of
(2) Removal amount is the approximate amount of free product and groundwater mixture removed from a monitoring well during free product recovery.

NA = not applicable

TABLE 2
TOP OF CASING ELEVATIONS, WATER TABLE ELEVATIONS, AND TOTAL DEPTHS
Site 189, Truman Annex
Naval Air Station, Key West, Florida

Well ID	Total Depth	Top of Casing Elevation[1]	June 27, 1998		October 2, 1998		December 2, 1998	
			Groundwater Level	Groundwater Elevation	Groundwater Elevation	Groundwater Elevation	Groundwater Level	Groundwater Elevation
B189-MW01	12.88	10.00	5.34	4.66	4.95	5.05	5.48	4.52
B189-MW02[2]	13.00	10.74	5.62	5.12	5.87	4.87	6.29	4.45
B189-MW03[2]	12.45	10.52	5.85	4.67	5.95	4.57	6.11	4.41
B189-MW04	12.97	10.91	6.15	4.76	4.39	6.52	6.11	4.80
B189-MW05	12.47	11.04	NM	NM	4.12	6.92	6.06	4.98
B189-MW06R	12.52	9.38	NM	NM	4.79	4.59	4.91	4.47
B189-MW07	12.61	9.08	4.41	4.67	4.08	5.00	4.48	4.60
B189-MW08	NM	10.62	NM	NM	5.72	4.90	NM	NM
B189-MW09	12.88	10.86	NM	NM	5.02	5.84	6.44	4.42
B189-MW10	12.95	10.22	5.21	5.01	5.73	4.49	5.49	4.73
B189-MW11	NM	10.45	NM	NM	5.95	4.50	6.03	4.42
B189-MW12	12.95	10.57	5.88	4.69	6.09	4.48	6.12	4.45
B189-MW13D	36.00	10.52	5.81	4.71	5.35	5.17	6.07	4.45

NOTES:
[1] Top of casing and groundwater elevations are relative to an arbitrary site reference elevation of 10 feet.
[2] Free phase petroleum product was present in both B189-MW02 and B189-MW03. Product measurements were not taken because the product was viscous and adhered to the probe surface.
All measurements reported in feet.
NM – not measured. B189-MW06R had not yet been installed and the original well could not be found.

TABLE 2
TOP OF CASING ELEVATIONS, WATER TABLE ELEVATIONS, AND TOTAL DEPTHS
Site 189, Truman Annex
Naval Air Station, Key West, Florida

Well ID	Total Depth	Top of Casing Elevation[1]	February 24, 1999		June 15, 1999		September 1, 1999	
			Groundwater Level	Groundwater Elevation	Groundwater Level	Groundwater Elevation	Groundwater Level	Groundwater Elevation
B189-MW01	12.88	10.00	5.42	4.58	4.98	5.02	4.81	5.19
B189-MW02[2]	13.00	10.74	NM	NM	5.42	5.32	5.50	5.24
B189-MW03[2]	12.45	10.52	5.72	4.67	5.23	5.29	5.20	5.32
B189-MW04	12.97	10.91	5.95	4.96	5.80	5.11	5.75	5.16
B189-MW05	12.47	11.04	NM	NM	NM	NM	NM	NM
B189-MW06R	12.52	9.38	4.61	4.77	4.45	4.93	4.26	5.12
B189-MW07	12.61	9.08	4.11	4.97	4.08	5.00	4.10	4.98
B189-MW08	NM	10.62	NM	NM	NM	NM	NM	NM
B189-MW09	12.88	10.86	NM	NM	NM	NM	NM	NM
B189-MW10	12.95	10.22	4.35	5.87	4.40	5.82	4.84	5.38
B189-MW11	NM	10.45	NM	NM	NM	NM	NM	NM
B189-MW12	12.95	10.57	5.51	5.06	5.12	5.45	5.17	5.40
B189-MW13D	36.00	10.52	5.85	4.67	4.15	6.37	4.42	6.10

TABLE 2
TOP OF CASING ELEVATIONS, WATER TABLE ELEVATIONS, AND TOTAL DEPTHS
Site 189, Truman Annex
Naval Air Station, Key West, Florida

Well ID	Total Depth	Top of Casing Elevation[1]	November 25, 1999					
			Groundwater Level	Groundwater Elevation	Groundwater Level	Groundwater Elevation	Groundwater Level	Groundwater Elevation
B189-MW01	12.88	10.00	4.59	5.41				
B189-MW02[2]	13.00	10.74	5.31	5.43				
B189-MW03[2]	12.45	10.52	5.04	5.48				
B189-MW04	12.97	10.91	5.36	5.55				
B189-MW05	12.47	11.04	NM	NM				
B189-MW06R	12.52	9.38	3.87	5.51				
B189-MW07	12.61	9.08	3.41	5.67				
B189-MW08	NM	10.62	NM	NM				
B189-MW09	12.88	10.86	NM	NM				
B189-MW10	12.95	10.22	4.77	5.45				
B189-MW11	NM	10.45	NM	NM				
B189-MW12	12.95	10.57	5.07	5.50				
B189-MW13D	36.00	10.52	3.90	6.62				

ATTACHMENT C

FLORIDA

DEP Form # 62-770.900(1)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products
Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-1	SAMPLE ID: B151-MW01-GW	DATE: 11/25/99
SITE NAME: NAS Key West	SITE LOCATION:		

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 12.88	DEPTH TO WATER (ft): 4.59	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) x WELL CAPACITY =

= (12.88 - 4.59) x 0.16 = 1.32

PURGE METHOD: Peristaltic pump.	PURGING INITIATED AT:	PURGING ENDED AT:	
	PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal): ≈5 gal.	

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.25	25.0	14.72	clear	none	N/A	
1	2	7.21	25.1	14.58	↓	↓		
1	3	7.20	25.1	14.62				
1	4	7.20	25.1	14.62				
1	5	7.20	25.1	14.61	✓	✓		
1								

SAMPLING DATA

SAMPLED BY / AFFILIATION: GB/TT NUS.	SAMPLER(S) SIGNATURE(S): Gary Bangs.		
SAMPLING METHOD(S): Peristaltic pump.	SAMPLING INITIATED AT:	SAMPLING ENDED AT:	
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1L				

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

FLORIDA

DEP Form # 62-770.900(1)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products
Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-2	SAMPLE ID: 6159-MW-2	DATE: 11/23/99
SITE NAME: NAS KW		SITE LOCATION: Truman Annex	

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 13.00	DEPTH TO WATER (ft): 5.31	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) x WELL CAPACITY =

= (13.00 - 5.31) x 0.16 = 1.23

PURGE METHOD: Peristaltic pump.		PURGING INITIATED AT:	PURGING ENDED AT:
		PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal):

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	8.10	25.3	14.01	clear	Petroleum odor.		
1	2	8.15	25.2	14.07				
1	3	8.13	25.3	14.07				
1	4	8.13	25.3	14.05				
1	5	8.13	25.3	14.00				

SAMPLING DATA

SAMPLED BY / AFFILIATION: GB / TTWUS		SAMPLER(S) SIGNATURE(S): Gary Burgess	
SAMPLING METHOD(S): Peristaltic pump		SAMPLING INITIATED AT:	SAMPLING ENDED AT:
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y N		DUPLICATE: Y N

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1 L	none			

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

DEP Form # 62-770.900(1)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products
Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-3	SAMPLE ID:	DATE: 11/25/99
SITE NAME: NAS KW		SITE LOCATION: Truman Annex	

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 12.45	DEPTH TO WATER (ft): 5.04	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) x WELL CAPACITY =

= (12.45 - 5.04) x 0.16 = 1.18.

PURGE METHOD: Peristaltic pump.		PURGING INITIATED AT:	PURGING ENDED AT:
		PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal): ≈ 5 gal.

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.45	25.6	11.32	clear	none.		
1	2	7.41	25.5	11.25	↓	↓		
1	3	7.41	25.5	11.24				
1	4	7.41	25.5	11.24				
1	5	7.41	25.5	11.23				

SAMPLING DATA

SAMPLED BY / AFFILIATION: GB / TNUS		SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Peristaltic pump / low flow		SAMPLING INITIATED AT:	SAMPLING ENDED AT:
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N)		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	2G					

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

FLORIDA

DEP Form # 62-770.900(1)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products
Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-4	SAMPLE ID: B-189-MW	DATE: 11/25/97
SITE NAME: NAS Key West	SITE LOCATION: Truman Annex		

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 12.97	DEPTH TO WATER (ft): 5.36	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) x WELL CAPACITY =

= (12.97 - 5.36) x 0.16 = 1.21

PURGE METHOD: Peristaltic pump		PURGING INITIATED AT:	PURGING ENDED AT:
		PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal): ≈ 5 gal.

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.61	25.6	12.32	none	none	N/A	
1	2	7.60	25.5	12.31	↓	↓		
1	3	7.60	25.6	12.33				
1	4	7.61	25.6	12.33				
1	5	7.60	25.6	12.33				

SAMPLING DATA

SAMPLED BY / AFFILIATION: GB / TTNUS		SAMPLER(S) SIGNATURE(S): [signature]	
SAMPLING METHOD(S): Peristaltic pump / low flow		SAMPLING INITIATED AT:	SAMPLING ENDED AT:
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N)		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1L	none.			

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

FLORIDA

DEP Form # 62-770.900(3)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-6	SAMPLE ID: B189-MW-06	DATE: 11/25/99
SITE NAME: NAS - Key West	SITE LOCATION: Truman Annex		

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 12.52	DEPTH TO WATER (ft): 3.87	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH − DEPTH TO WATER) x WELL CAPACITY =

= (12.52 − 3.87) x 0.16 = 1.38

PURGE METHOD: Peristaltic pump.	PURGING INITIATED AT:	PURGING ENDED AT:
	PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal): ≈ 5 gal.

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.05	25.4	11.61	clear	none	N/A	
1	2	7.07	25.5	11.51	↓	↓		
1	3	7.07	25.5	11.55				
1	4	7.06	25.5	11.55				
1	5	7.06	25.5	11.55				

SAMPLING DATA

SAMPLED BY / AFFILIATION: TT NUS / Gary Bungay	SAMPLER(S) SIGNATURE(S): Gary Bungay
SAMPLING METHOD(S): Peristaltic pump / Low flow	SAMPLING INITIATED AT: / SAMPLING ENDED AT:

FIELD DECONTAMINATION: Y (N) FIELD-FILTERED: Y (N) DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1L	none			

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

DEP Form # 62-770.900(1)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products
Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-7	SAMPLE ID: BISS-MW-07	DATE: 11/25/98
SITE NAME: NAS Key West		SITE LOCATION: Truman Annex	

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 12.61	DEPTH TO WATER (ft): 3.41	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) x WELL CAPACITY =

= (12.61 - 3.41) x 0.16 = 1.47

PURGE METHOD: Peristaltic pump		PURGING INITIATED AT:	PURGING ENDED AT:
		PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal): ≈5 gal.

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.51	25.6	9.35	clear	none	N/A	
1	2	7.45	25.5	9.36	↓	↓	↓	
1	3	7.44	25.6	9.36				
1	4	7.44	25.7	9.36				
1	5	7.44	25.7	9.36				

SAMPLING DATA

SAMPLED BY / AFFILIATION: Gary Bergeron / TTNUS.		SAMPLER(S) SIGNATURE(S): Gary Bergeron	
SAMPLING METHOD(S): Peristaltic pump / low flow		SAMPLING INITIATED AT:	SAMPLING ENDED AT:
FIELD DECONTAMINATION: Y (N)	FIELD-FILTERED: Y (N)		DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1L	none			

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

DEP Form # 62-770.900(3)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-10	SAMPLE ID: B189-MW-10	DATE: 11/25/99
SITE NAME: NAS Key West	SITE LOCATION: Truman Annex		

PURGE DATA

WELL DIAMETER (in):	TOTAL WELL DEPTH (ft): 12.95	DEPTH TO WATER (ft): 4.77	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) x WELL CAPACITY =

= (12.95 - 4.77) x 0.16 = 1.30

PURGE METHOD: Peristaltic pump	PURGING INITIATED AT:	PURGING ENDED AT:
	PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal): ≈ 5 gal.

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.75	25.5	14.41	clear	none	N/A	
1	2	7.72	25.6	14.39	↓	↓	↓	
1	3	7.72	25.7	14.39	↓	↓	↓	
1	4	7.72	25.7	14.39	↓	↓	↓	
1	5	7.72	25.7	14.38	↓	↓	↓	

SAMPLING DATA

SAMPLED BY / AFFILIATION: GB / TTNUS	SAMPLER(S) SIGNATURE(S): Gary Bangue	
SAMPLING METHOD(S): Peristaltic pump / low flow	SAMPLING INITIATED AT:	SAMPLING ENDED AT:

FIELD DECONTAMINATION: Y (N) | FIELD-FILTERED: Y (N) | DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1L	None.			

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

FLORIDA

DEP Form # 62-770.900(3)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW-12	SAMPLE ID: B189-MW12	DATE: 11/25/99
SITE NAME: NAS Key West	SITE LOCATION: Truman Annex		

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 12.95	DEPTH TO WATER (ft): 5.07	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH − DEPTH TO WATER) x WELL CAPACITY =

= (12.95 − 5.07) x 0.16 = 1.26

PURGE METHOD: Peristaltic pump.	PURGING INITIATED AT:	PURGING ENDED AT:
	PURGE RATE (gpm): ≈ 0.1.	TOTAL VOLUME PURGED (gal): ≈ 5 gal.

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.62	25.8	12.3	clear	none	N/A	
1	2	7.63	25.7	12.2	↓	↓		
1	3	7.63	25.7	12.4				
1	4	7.62	25.7	12.4				
1	5	7.62	25.7	12.4				

SAMPLING DATA

SAMPLED BY / AFFILIATION: GB / TTNUS	SAMPLER(S) SIGNATURE(S): Gary [illegible]	
SAMPLING METHOD(S): Peristaltic pump / low flow.	SAMPLING INITIATED AT:	SAMPLING ENDED AT:

FIELD DECONTAMINATION: Y (N) | FIELD-FILTERED: Y (N) | DUPLICATE: Y (N).

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1L	none			

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

DEP Form # 62-770.900(3)
Form Title: Petroleum or Petroleum Products Water Sampling Log
Effective Date: September 23, 1997

Petroleum or Petroleum Products Water Sampling Log

FDEP FACILITY NO.:	WELL NO.: MW 13 D	SAMPLE ID: B189-MW-B	DATE: 11/25/97
SITE NAME: NAS Key West		SITE LOCATION: Truman Annex	

PURGE DATA

WELL DIAMETER (in): 2"	TOTAL WELL DEPTH (ft): 36.0	DEPTH TO WATER (ft): 3.90	WELL CAPACITY (gal/ft): 0.16

1 WELL VOLUME (gal) = (TOTAL WELL DEPTH – DEPTH TO WATER) x WELL CAPACITY =

= (36.0 - 3.90) x 0.16 = 5.68

PURGE METHOD: Peristaltic pump.		PURGING INITIATED AT:	PURGING ENDED AT:
		PURGE RATE (gpm):	TOTAL VOLUME PURGED (gal): ≈10 gal.

WELL VOLS. PURGED	CUMUL. VOLUME PURGED (gal)	pH	TEMP. (°C)	COND. (µmhos)	COLOR	ODOR	APPEARANCE	OTHER
1	1	7.85	25.6	12.31	clear	none	N/A	
1	2	7.80	25.7	12.25				
1	3	7.81	25.7	12.25				
1	4	7.81	25.7	12.25				
1	5	7.81	25.7	12.25				

SAMPLING DATA

SAMPLED BY / AFFILIATION: GB / TTNUS		SAMPLER(S) SIGNATURE(S): Gary Bergin Jr.	
SAMPLING METHOD(S): Peristaltic pump		SAMPLING INITIATED AT:	SAMPLING ENDED AT:
FIELD DECONTAMINATION: Y (N)		FIELD-FILTERED: Y (N)	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATIONS			SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD
NO.	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOLUME ADDED IN FIELD (ml)	FINAL pH	
	AG	1L	None.	—		

REMARKS:

MATERIAL CODES: AG = AMBER GLASS; CG = CLEAR GLASS; HDP = HIGH DENSITY POLYETHYLENE; O = OTHER (SPECIFY)

WELL CAPACITY: 1.25" = 0.06 gal/ft; 2" = 0.16 gal/ft; 4" = 0.65 gal/ft; 6" = 1.47 gal/ft; 8" = 2.61 gal/ft; 12" = 5.88 gal/ft

NOTE: this does not constitute all the information required by Chapter 62-160, F.A.C.

ATTACHMENT D

PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765
Phone: 407-359-7194 Fax: 407-359-7197

12-03-1999

Rick Ofsanko
Tetra Tech NUS, Inc.
794 S. Military Trail
Deerfield Beach, FL 33442-

Dear Rick Ofsanko:

Enclosed are the results of the analysis of your samples received 11/27/1999.

Our laboratory is certified by the Florida DHRS (Lab #E83239) and operates under an FDEP approved Comprehensive Quality Assurance Plan (#900134G). Unless otherwise noted, all results are reported as received. All data were determined in accordance with published procedures (EPA-600/4-79-020), Methods for Chemical Analysis of Water and Wastes, Revised March 1983, or later and/or Standard Methods for the examination of Water and Wastewater, 18th Edition 1989, or later and/or Test Methods for Evaluating Solid Waste (EPA-SW-846, Revised January 1995, or later), unless stated otherwise in our CompQapp under method modifications.

If you have any questions, please do not hesitate to give me a call.

Sincerely,

Beckie J. Burdick
Laboratory Manager

PC&B Environmental Laboratories, Inc.

210 Park Road, Oviedo, Florida 32765
Phone: 407-359-7194 Fax: 407-359-7197

Client : Tetra Tech NUS, Inc.
794 S. Military Trail
Deerfield Beach, FL 33442-

Contact : Rick Ofsanko
Phone : (954) 570-5885

Laboratory Reference Number : 99110223

Project Name : NAS Key West
Project Number : 7846

Chain of Custody : 19172

Laboratory ID	Matrix	Client ID	Status	Date/Time Sampled	
99110223-1	Water	B-189-MW01-GW-06	RUN	11/25/1999	09:00
99110223-2	Water	B-189-MW02-GW-06	RUN	11/25/1999	16:02
99110223-3	Water	B-189-MW03-GW-06	RUN	11/25/1999	12:15
99110223-4	Water	B-189-MW04-GW-06	RUN	11/25/1999	11:20
99110223-5	Water	B-189-MW06R-GW-06	RUN	11/25/1999	15:00
99110223-6	Water	B-189-MW07-GW-06	RUN	11/25/1999	10:30
99110223-7	Water	B-189-MW10-GW-06	RUN	11/25/1999	14:03
99110223-8	Water	B-189-MW12-GW-06	RUN	11/25/1999	09:45
99110223-9	Water	B-189-MW13D-GW-06	RUN	11/25/1999	13:11
99110223-10	Water	B-189-DUP01-GW-06	RUN	11/25/1999	
99110223-11	Water	EQ BLK	RUN	11/25/1999	14:30

Number	Parameter	Description
11	EPA 8310	PAH's by HPLC

PC&B Environmental Laboratories, Inc.
210 Park Road
Oviedo, FL 32765
PHONE: 407-359-7194
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.
PROJECT NAME: NAS Key West
PROJECT NUMBER: 7846
DATE RECEIVED: 11/27/1999
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number	99110223-1	99110223-2	99110223-3	99110223-4	99110223-5
Client Sample ID	B-189-MW01-GW-06	B-189-MW02-GW-06	B-189-MW03-GW-06	B-189-MW04-GW-06	B-189-MW06R-GW-06
Date Sampled	11/25/1999	11/25/1999	11/25/1999	11/25/1999	11/25/1999
Date Extracted	11/30/1999	11/30/1999	11/30/1999	11/30/1999	11/30/1999
Date Analyzed	12/01/1999	12/01/1999	12/01/1999	12/01/1999	12/01/1999
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	No	No	No	No	No
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Acenaphthene	3 U	3 U	3 U	3 U	3 U
Acenaphthylene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Anthracene	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U
Benzo(a)anthracene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(a)pyrene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(b)fluoranthene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(ghi)perylene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(k)fluoranthene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Chrysene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Dibenzo(ah)anthracene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Fluoranthene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(123cd)pyrene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Naphthalene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1-Methyl naphthalene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Methyl naphthalene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Phenanthrene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pyrene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : _____

PC&B Environmental Laboratories, Inc.
210 Park Road
Oviedo, FL 32765
PHONE: 407-359-7194
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.
PROJECT NAME: NAS Key West
PROJECT NUMBER: 7846
DATE RECEIVED: 11/27/1999
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number	99110223-6	99110223-7	99110223-8	99110223-9	99110223-10
Client Sample ID	B-189-MW07-GW-06	B-189-MW10-GW-06	B-189-MW12-GW-06	B-189-MW13D-GW-06	B-189-DUP01-GW-06
Date Sampled	11/25/1999	11/25/1999	11/25/1999	11/25/1999	11/25/1999
Date Extracted	11/30/1999	11/30/1999	11/30/1999	11/30/1999	11/30/1999
Date Analyzed	12/01/1999	12/01/1999	12/01/1999	12/01/1999	12/01/1999
Sample Matrix (as Received)	Water	Water	Water	Water	Water
Analysis Confirmed	No	Yes	No	No	No
Dilution Factor	1	1	1	1	1
Result Units	ug/l	ug/l	ug/l	ug/l	ug/l
Acenaphthene	3 U	3 U	3 U	3 U	3 U
Acenaphthylene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Anthracene	0.30 U	0.30 U	0.30 U	0.30 U	0.30 U
Benzo(a)anthracene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(a)pyrene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(b)fluoranthene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(ghi)perylene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Benzo(k)fluoranthene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Chrysene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Dibenzo(ah)anthracene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Fluoranthene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Fluorene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Indeno(123cd)pyrene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Naphthalene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
1-Methyl naphthalene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
2-Methyl naphthalene	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Phenanthrene	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U
Pyrene	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : _____

PC&B Environmental Laboratories, Inc.
210 Park Road
Oviedo, FL 32765
PHONE: 407-359-7194
FAX: 359-7197

PAH's by HPLC

CLIENT NAME: Tetra Tech NUS, Inc.
PROJECT NAME: NAS Key West
PROJECT NUMBER: 7846
DATE RECEIVED: 11/27/1999
ANALYTICAL PROTOCOL: EPA 8310

Lab Reference Number	99110223-11	
Client Sample ID	EQ BLK	
Date Sampled	11/25/1999	
Date Extracted	11/30/1999	
Date Analyzed	12/01/1999	
Sample Matrix (as Received)	Water	
Analysis Confirmed	No	
Dilution Factor	1	
Result Units	ug/l	
Acenaphthene	3	U
Acenaphthylene	0.03	U
Anthracene	0.30	U
Benzo(a)anthracene	0.03	U
Benzo(a)pyrene	0.03	U
Benzo(b)fluoranthene	0.03	U
Benzo(ghi)perylene	0.03	U
Benzo(k)fluoranthene	0.03	U
Chrysene	0.03	U
Dibenzo(ah)anthracene	0.03	U
Fluoranthene	0.3	U
Fluorene	1.0	U
Indeno(123cd)pyrene	0.03	U
Naphthalene	1.0	U
1-Methyl naphthalene	1.0	U
2-Methyl naphthalene	1.0	U
Phenanthrene	0.03	U
Pyrene	0.3	U

U = Undetected. The value preceeding the 'U' is the MDL for the analyte, based on dilution. Results reported on a Wet Weight basis.

FDEP CompQAPP # 900134G - FHRS Certification # E83239/83353

Reviewed by : _____

Quality Control Report for Spike/Spike Duplicate Analysis

PAH's by HPLC

Matrix: Water
Lab Sample ID: 9911006-1
QC Batch ID: 9911PAH107
Spike Units: ug/l

Analysis Date: 12/01/1999
Preparation Date: 11/30/1999
Method: EPA 8310
Analyst: ELA

Analyte	Spike Amount	Sample Result	Spike Result	Spike Percent Recovery	MSD Result	MSD Percent Recovery	RPD
Acenaphthene	50.0	0.0	35.0	70	35.0	70	0
Acenaphthylene	25.0	0.0	19.0	76	23.0	92	19
Anthracene	1.0	0.0	0.9	86	0.9	86	0
Benzo(a)anthracene	2.5	0.0	2.3	94	2.4	95	1
Benzo(a)pyrene	2.5	0.0	2.0	82	2.1	83	2
Benzo(b)fluoranthene	1.0	0.0	0.8	80	0.8	80	0
Benzo(ghi)perylene	4.0	0.0	3.4	84	3.3	83	1
Benzo(k)fluoranthene	1.0	0.0	0.8	75	0.8	78	4
Chrysene	2.5	0.0	2.1	84	2.2	86	2
Dibenzo(ah)anthracene	10.0	0.0	7.6	76	7.8	78	2
Fluoranthene	2.5	0.0	2.0	81	2.1	85	5
Fluorene	5.0	0.0	5.0	100	5.0	100	0
Indeno(123cd)pyrene	2.5	0.0	2.3	90	2.2	88	2
Naphthalene	25.0	0.0	20.0	80	20.0	80	0
Phenanthrene	2.0	0.0	2.0	100	2.0	100	0
Pyrene	5.0	0.0	3.9	77	4.8	96	21

Quality Control Limits

Analyte	Lower Limit	Upper Limit	RPD
Acenaphthene	45	133	33
Acenaphthylene	45	133	25
Anthracene	45	133	25
Benzo(a)anthracene	45	133	25
Benzo(a)pyrene	45	133	25
Benzo(b)fluoranthene	45	133	25
Benzo(ghi)perylene	45	133	25
Benzo(k)fluoranthene	45	133	25
Chrysene	45	133	25
Dibenzo(ah)anthracene	45	160	25
Fluoranthene	45	133	25
Fluorene	45	133	25
Indeno(123cd)pyrene	45	133	25
Naphthalene	45	133	25
Phenanthrene	45	133	30
Pyrene	45	133	25

19172

PC&B Environmental

210 Park Road, Oviedo, FL 32765
407-359-7194 (FAX) 407-359-7197

Chain of Custody

Work Order: 9911 0223

Date: 11/26/99 **Page** 1 **of** 1

COMPANY: TETRA TECH NUS

ADDRESS: 794 S. MILITARY TRAIL

SAMPLED BY: BARY BRAGANZA SIGN: [signature]

PHONE: (954) 570-5885 FAX: (954) 570-5974

ANALYSIS REQUESTED: PAH

#	SAMPLE ID	DATE/TIME	MATRIX: AIR	WATER	SLUDGE	SOIL/SOLID	ORG. LIQUID	PRESERVATION	Number of Containers
1	B-189-MW01-GW-06	11/25/99 9:00		X				✓	1
2	B-189-MW02-GW-06	14:00						✓	1
3	B-189-MW03-GW-06	12:15						✓	1
4	B-189-MW04-GW-06	11:20						✓	1
5	B-189-MW06R-GW-06	15:00						✓	1
6	B-189-MW07-GW-06	10:30						✓	1
7	B-189-MW10-GW-06	14:03						✓	1
8	B-189-MW12-GW-06	9:45						✓	1
9	B-189-MW13D-GW-06	13:11						✓	1
10	B-189-DUP01-GW-06							✓	1
11	EQ BLK	14:30						✓	1
12									
13									

RELINQUISHED BY	DATE/TIME	RECEIVED BY	DATE/TIME
1: [signature]	11.9.99	1: [signature]	11/25
2: [signature]	11/	2: [signature]	11/27/99 10:30
3:		3:	

SPECIAL INSTRUCTIONS/COMMENTS:

QUOTE/CONTRACT #:

PROJECT INFORMATION

PROJECT NAME: NAS KEY WEST

PROJECT #: 7846

SITE ADDRESS: TRUMEN ANNEX

PROJECT MANAGER: RICK OPSANKO

SAMPLE RECEIPT

Total # of Containers	11
Chain of Custody Seals	
Recv'd in Good Condition	
PO #:	

INVOICE TO: (IF DIFFERENT FROM ABOVE)

WHITE: Project File YELLOW: Laboratory PINK: Sampler