N91192.AR.001418
NIROP FRIDLEY, MN
5090.3a

CHANGE PAGES FOR 2004 ANNUAL MONITORING REPORT AND REMEDIAL ACTION WORK PLAN WITH TRANSMITTAL NIROP FRIDLEY MN
11/18/2005
TETRA TECH

TETRA TECH NUS, INC.
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PITT-11-5-051

November 18, 2005

Project Number 0016

Commander, Southern Division
Naval Facilities Engineering Command
Attn: Dan Owens, Code ES32
2155 Eagle Drive
North Charleston, South Carolina 29406

Reference: CLEAN CONTRACT No. N62467-94-D-0888
Contract Task Order No. 0366

Subject: 2004 Annual Monitoring Report and Remedial Action Work Plan
NIROP Fridley, Fridley Minnesota

Dear Dan:

Please find enclosed two copies of the RTC and change pages for the 2004 AMR and update pages for the RAWP.

For the AMR, please remove and replace the table of contents (including the acronym list, which is now updated) and the Section 3 text (but not the tables, except for Table 3-1 which is on the reverse of text page 3-5). Because of two-sided copying, replacement page 3-5 also has unchanged Table 3-1 on the reverse. For the AMR, the RTC is three-hole punched and can be placed into the AMR binder for convenience.

For the RAWP, please find replacement Table 4-10 for the RAMP (Volume 1 of the RAMP), detailing the new groundwater monitoring wells recently installed in the East River Road median (54-S, 54-I, 55-I, 56-S and 56-I. Table 4-11 is unchanged, but is included only because new Table 4-12 providing information about the vegetable oil pilot test wells is now included.

Additional RAWP tables will be updated following completion of the 2005 AMR. The new wells in the East River Road median will likely need to be considered for addition into the sampling network. The Navy will make a recommendation about how to handle these wells in the 2005 AMR after reviewing the sampling results. The Navy did not unilaterally insert these wells into the ongoing sampling network, because the original plan was developed by the Team employing the DQOs to determine which monitoring wells would provide data to support various specific decisions, and because the sampling frequency for individual wells varies in order to support those decisions.

A new Table of Contents for the RAMP (Volume 1 of the RAWP) is being provided to include new Table 4-12. Please also find an updated signature/approval page for the QAPP (Volume 2 of the RAWP). The MPCA approval letter is copied onto the reverse of the QAPP signature page.

Please provide the second copy of these documents to Mr. Cliff Casey.

Sincerely,

Mark Sladic P.E.
Task Order Manager

MS/kf

Enclosure

cc: Dave Douglas, MPCA (2 copies)
Tom Smith, USEPA (1 copy)
Richard Harris, RAB Co-Chair (1 copy)
Tim Ruda, BAE Systems (1 copy)
Rick Kuhlthau, Tech Law (1 copy)
Laura Pugh, Tech Law (1 copy)
Hal Davis, USGS (1 copy)
Venky Venkatesh, CH2MHill (1 copy)
Dan Griffiths, Parsons (1 copy)
Paul Walz, Bay West (1 copy)
Corey Rich, TtNUS (1 copy)
Jeff Orient, TtNUS (1 copy)
Debra Humbert, TtNUS (Cover Letter Only)
Mark Perry/File CTO 0366 TtNUS (Unbound copy)

REVISION 1
SEPTEMBER 2005

REMEDIAL ACTION WORK PLAN

VOLUME II

QUALITY ASSURANCE PROJECT PLAN
FOR
FIELD ACTIVITIES

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
FRIDLEY, MINNESOTA

COMPREHENSIVE LONG-TERM
ENVIRONMENTAL ACTION NAVY (CLEAN) CONTRACT

Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

Submitted by:
Tetra Tech NUS, Inc.
661 Andersen Drive
Foster Plaza 7
Pittsburgh, Pennsylvania 15220

CONTRACT NUMBER N62467-94-D-0888
CONTRACT TASK ORDER 0330

SEPTEMBER 2005

Date 9-19-05
PROJECT MANAGER
TETRA TECH NUS, INC.

Date 10/09/05
REMEDIAL PROJECT MANAGER
U.S. EPA REGION 5

Date 9-19-05
QUALITY ASSURANCE REVIEWER
TETRA TECH NUS, INC.

N/A Date
QUALITY ASSURANCE REVIEWER
U.S. EPA REGION 5

Date 10/5/05
PROJECT MANAGER
BAY WEST

Date 10/05/05
PROJECT MANAGER
DEPARTMENT OF THE NAVY

Date 9/16/05
VICE PRESIDENT
COLUMBIA ANALYTICAL SERVICES, INC.

Minnesota Pollution Control Agency

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 6, 2005

Commanding Officer
Southern Division
Naval Facilities Engineering Command
Attn.: Dan Owens, Code ES32
P.O. Box 190010
North Charleston, SC 29419-9010

RE: Naval Industrial Reserve Ordnance Plant Superfund Site

Dear Mr. Owens:

The Minnesota Pollution Control Agency (MPCA) staff has reviewed the final change pages to the Remedial Action Work Plan, dated September 2005, submitted by Mr. Mark Sladic of Tetra Tech NUS, Inc. on behalf of the U.S. Navy in his letter of September 23, 2005. The Remedial Action Work Plan is for Operable Unit 1 of the Naval Industrial Reserve Ordnance Plant (NIROP) Superfund Site and was submitted pursuant to the Federal Facility Agreement, dated March 27, 1991, between the MPCA, the U.S. Environmental Protection Agency, and the U.S. Navy (Navy).

The MPCA staff hereby approves the Response Action Work Plan as modified by the final change pages contained in Mr. Sladic's letter cited above.

If you have any questions regarding this letter, please call me at (651) 296-7818.

Sincerely,

David N. Douglas, Project Manager
Superfund Unit 2
Superfund and Emergency Response Section
Remediation Division

DND:csa

cc: Tom Smith, U.S. Environmental Protection Agency
Mark Sladic, Tetra Tech NUS, Inc.
Venky Venkatesh CH2MHILL Constructors, Inc.

TABLES

NUMBER

FIGURES

NUMBER

ACRONYMS

ACL	Alternative concentration limit
ACP	Anoka County Park
AER	Air emission rate
AMR	Annual Monitoring Report
COC	Chain-of-custody
CTO	Contract Task Order
DQO	Data Quality Objective
FS	Feasibility Study
FFA	Federal Facility Agreement
GWTF	Groundwater Treatment Facility
IDW	Investigation derived waste
ISCST3	Industrial Source Complex Short-Term, Version 3
MCES	Metropolitan Council Environmental Services
MCL	Maximum Contaminant Level
MGD	Million Gallons per Day
MPCA	Minnesota Pollution Control Agency
MS	Matrix spike
MSD	Matrix spike duplicate
NIROP	Navil Industrial Reserve Ordnance Plant
NPDES	National Pollutant Discharge Elimination System
NTU	Nephelometric Turbidity Unit
O&M	Operations and Maintenance
OU	Operable Unit
PCJ	Prairie du Chien Dolomite and Jordan Sandstone
PPE	Personal protective equipment
PQL	Practical quantitation limit
PVC	Polyvinyl chloride
QA	Quality assurance
QC	Quality Control
QAPP	Quality Assurance Project Plan
RAB	Restoration Advisory Board
RAMP	Remedial Action Monitoring Plan
RAWP	Remedial Action Work Plan

TABLE 4-10

MONITORING AND EXTRACTION WELL CONSTRUCTION DATA
NIROP FRIDLEY, MINNESOTA

Well Number	Top of Casing Elevation (ft msl)	Well Depth (ft)	Nominal Well Diameter (in)
NIROP SHALLOW WELLS			
1-S	836.93	34.96	2
2-S	835.91	34.27	2
3-S	836.62	34.17	2
4-S	837.33	34.81	2
5-S	834.92	34.67	2
6-S	835.60	34.55	2
7-S	835.80	29.92	2
8-S	835.59	29.32	2
9-S	836.53	29.85	2
10-S	835.73	31.39	2
11-S	835.75	30.39	2
11-SB	837.28	39.44	2
12-S	838.38	34.50	2
13-S	834.40	34.30	2
14-S	835.82	33.65	2
14-IS	835.21	NA	?
15-S	834.68	34.10	2
16-S	837.12	35.13	2
17-S	835.48	38.18	2
18-S	833.86	40.07	2.5
19-S	834.18	44.88	2
20-S	837.51	35.45	2
21-S	837.50	36.74	2
22-S	837.60	37.95	2
23-S	846.96	42.60	2
24-S	836.19	36.78	2
25-S	835.14	37.75	2
26-S	834.06	NA	2
27-S	832.74	NA	2
AT-2	834.99	66.01	10
AT-4	836.44	NA	8
AT-5A	835.57	NA	8?
AT-7	836.30	40.41	8
AT-8	835.18	38.30	8
AT-9	836.82	53.81	8
MS-28S	834.81	27.30	2
MS-29S	834.68	27.26	2
MS-30S	834.83	27.45	2
MS-31S	834.81	27.49	2

TABLE 4-10

MONITORING AND EXTRACTION WELL CONSTRUCTION DATA
NIROP FRIDLEY, MINNESOTA

Well Number	Top of Casing Elevation (ft msl)	Well Depth (ft)	Nominal Well Diameter (in)
NIROP SHALLOW WELLS (Continued)			
MS-32S	834.76	26.11	2
MS-33S	834.72	27.05	2
MS-34S	834.31	26.76	2
MS-35S	834.22	26.77	2
MS-36S	834.80	44.70	2
MS-37S	834.21	47.73	2
MS-38S	834.64	41.69	2
MS-39S	834.76	41.27	2
MS-40S	834.61	40.74	2
MS-40I	834.64	60.44	2
MS-41S	834.82	43.41	2
MS-43S	834.42	38.86	2
MS-44S	833.53	35.70	2
MS-45S	832.13	34.90	2
MS-47S	834.83	39.90	2
MS-49S	834.16	39.92	2
MS-52S	833.14	40.04	2
MS-54S	835.51	36.5	2
MS-56S	835.03	36.5	2
USGS 1	835.63	40.69	2
USGS 2	837.39	40.52	2
USGS 3	834.24	44.89	2
USGS 4	831.84	45.47	2
USGS 5	832.86	44.85	2
USGS 6	836.83	39.95	2
USGS 7	835.47	45.22	2
USGS 8	836.10	44.96	2
USGS 9	836.50	44.88	2
NIROP INTERMEDIATE WELLS			
1-IS	835.12	77.65	2?
2-IS	837.89	77.11	2?
3-IS	837.21	77.21	2?
4-IS	833.34	76.73	2?
5-IS	837.86	63.69	2?
6-IS	836.53	NA	?
7-IS	837.02	NA	?
8-IS	836.65	NA	?
10-IS	836.87	NA	?
11-IS	NA	NA	NA

TABLE 4-10

MONITORING AND EXTRACTION WELL CONSTRUCTION DATA
NIROP FRIDLEY, MINNESOTA

Well Number	Top of Casing Elevation (ft msl)	Well Depth (ft)	Nominal Well Diameter (in)
NIROP INTERMEDIATE WELLS (Continued)			
12-IS	834.94	NA	2
13-IS	834.96	NA	2
15-IS	833.67	77.86	2
16-IS	832.77	NA	2
AT-1A	838.53	65.23	6
AT-3A	836.10	NA	8
AT-10	837.11	84.96	8
MS-28I	834.83	85.52	2
MS-29I	834.67	81.15	2
MS-30I	834.85	67.77	2
MS-31I	834.81	96.59	2
MS-32I	834.69	84.74	2
MS-33I	834.74	75.87	2
MS-34I	834.35	79.32	2
MS-35I	834.21	81.76	2
MS-36I	834.70	83.12	2
MS-41I	834.82	92.52	2
MS-42I	835.33	54.36	2
MS-43I	834.32	82.05	2
MS-44I	833.62	81.84	2
MS-45I	832.07	91.75	2
MS-46I	831.61	87.03	2
MS-47I	834.55	80.91	2
MS-49I	834.02	86.75	2
MS-51I	833.66	76.94	2
MS-52I	833.25	81.08	2
MS-54I	835.58	76.5	2
MS-55I	834.61	79.5	2
MS-56I	834.87	76.5	2
NIROP DEEP WELLS			
1-D	836.55	115.54	2
2-D	835.89	111.10	2
3-D	837.35	80.92	2
4-D	834.65	120.63	2
5-D	835.83	117.27	2
6-D	835.54	129.98	2
7-D	835.61	117.46	4
8-D	833.92	127.49	4
9-D	834.22	123.82	4

TABLE 4-10

MONITORING AND EXTRACTION WELL CONSTRUCTION DATA
NIROP FRIDLEY, MINNESOTA

Well Number	Top of Casing Elevation (ft msl)	Well Depth (ft)	Nominal Well Diameter (in)
NIROP DEEP WELLS (Continued)			
10-D	834.61	104.18	3
11-D	837.37	132.00	3
12-D	837.63	132.61	3
13-D	835.59	102.22	3
14-D	837.75	93.04	3
15-D	834.01	NA	?
16-D	833.08	NA	2
17-D	835.24	NA	?
AT-5B	835.62	NA	8
MS-28D	834.80	114.69	2
MS-29D	834.69	136.67	2
MS-30D	834.81	99.33	2
MS-31D	834.81	127.19	2
MS-32D	834.75	126.20	2
MS-33D	834.76	120.29	2
MS-34D	834.35	135.30	2
MS-35D	834.45	132.66	2
MS-35DPZ	834.26	131.74	2
MS-36D	834.79	134.16	2
MS-40D	834.70	135.25	2
MS-41D	834.89	134.57	2
MS-43D	834.27	112.94	2
MS-44D	833.58	119.87	2
MS-47D	834.51	132.35	2
MS-49D	833.87	129.19	2
MS-52D	833.27	140.03	2
USGS 10	836.85	130.30	2
NIROP BEDROOK WELLS			
1-PC	836.93	207.92	8.0-4.0
2-PC	837.91	178.08	8.0-4.0
3-PC	838.53	159.58	8.0-4.0
4-PC	834.63	182.21	8.0-4.0
5-PC	834.33	192.84	8.0-4.0
MS-48PC	831.5	166.9	2
MS-50PC	833.88	172.12	2
MS-53PC	832.64	169.16	2
Fridley Well 13	NA	NA	NA

TABLE 4-10

MONITORING AND EXTRACTION WELL CONSTRUCTION DATA
NIROP FRIDLEY, MINNESOTA

Well Number	Top of Casing Elevation (ft msl)	Well Depth (ft)	Nominal Well Diameter (in)
NIROP ACP OIL INJECTION WELLS			
PES-CW-1	832.01	42.93	2
PES-CW-2	833.02	43.04	2
PES-CW-3	835.47	42.86	2
PES-MW-1	832.49	47.79	3
PES-MW-2	832.41	47.68	3
PES-MW-3	832.80	42.74	3
PES-MW-4	832.57	42.72	3
PES-MW-5	832.60	42.89	3
PES-MW-6	832.41	47.71	3
PES-MW-7	832.58	52.78	3
PES-MW-8	832.64	42.80	3
PES-MW-9	832.85	42.73	3
PES-MW-10A	832.17	?	3
PES-MW-10B	832.11	?	3
PES-MW-11A	832.28	?	3
PES-MW-12A	833.89	?	3
PES-MW-12B	833.80	?	3
PES-MW-13A	832.15	?	3
PES-MW-14A	831.74	?	3
PES-MW-14B	831.84	?	3
PES-INJ-1	832.42	47.84	3
PES-INJ-2	832.87	52.96	3
PES-INJ-3	832.71	52.73	3
PES-BG-1	832.75	46.87	3
PES-BG-2	832.73	47.03	3
PES-BG-3	832.56	46.84	3
UNITED DEFENSE LP WELLS			
UD63-S	837.00	32.09	2
MISCELLANEOUS USGS WELLS			
MWW1	818.52	56.49	2.0
MWW2	819.49	20.50	?
MWW3	836.14	41.07	?
MWW4	832.01	57.80	2.0
MWW5	831.39	NA	?
MWW6	831.05	29.55	2.0
MWW9	833.29	24.00	2.0
MWW10	822.01	28.60	?
MWW11	820.65	58.25	2.0
MWW12	833.40	63.00	2.0

TABLE 4-10

MONITORING AND EXTRACTION WELL CONSTRUCTION DATA
NIROP FRIDLEY, MINNESOTA

Well Number	Top of Casing Elevation (ft msl)	Well Depth (ft)	Nominal Well Diameter (in)
MISCELLANEOUS USGS WELLS (Continued)			
MWW13	833.33	33.06	2.0
MWW14	836.25	54.85	2.0
MWW15	834.81	27.50	2.0
MWW16	814.35	70.00	2.0
MWW17	814.37	28.00	2.0
MWW18	819.22	73.00	2.0
MWW19	820.60	30.70	2.0
MWW20	811.01	44.00	2.0
MWW21	809.87	2.00	2.0

NA = Not available.
? = Information unclear or incomplete.
msl = Mean sea level.

TABLE 4-11

SUMMARY OF GROUNDWATER MONITORING PROGRAM QA/QC SAMPLING
NIROP FRIDLEY, MINNESOTA

Sample Type	Analytical Parameters[1]	Analytical Method	No. of Samples	No. of Field Duplicates[2]	No. of Rinsate Blanks[3]	No. of Trip Blanks[4]	No. of MS/MSD Samples	Frequency[5]
Monitoring Well	VOCs	SW-846 8260B	44	5	4	4	3	Varies per well
Extraction Well	VOCs	SW-846 8260B	7	1	0	1[6]	1	Twice a year
Fridley Well No. 13	VOCs	SW-846 8260B	1	1	0	1[6]	1	Once a year

Notes:

1 VOCs – volatile organic compounds (see Table 4-1); QA/QC samples not collected for field parameters.
2 The number of field duplicate samples collected varies per the sampling event.
3 Equipment rinsate blanks will be collected once daily during monitoring well sampling. Rinsate blanks will not be collected during sampling of extraction wells and Fridley Well No. 13 as these wells have dedicated pumps in place.
4 The number of trip blanks is estimated. One cooler containing VOC samples per day is anticipated.
5 See Table 4-5 for more information.
6 Trip blank shown for groundwater extraction well and Fridley Well No. 13 is intended for sampling rounds if only these wells are sampled. When more than one type of well is sampled (monitoring well, extraction well, Fridley well), additional trip blanks are not required, as long as the rate of one trip blank per cooler is met.

TABLE 4-12

NIROP VEGETABLE OIL PILOT SCALE STUDY
NIROP FRIDLEY, MINNESOTA

Well ID	Northing	Easting	TOC Elevation	Ground Elevation
PES-CW-1	1,077,292.3391	2,810,688.6130	832.01	829.08
PES-CW-2	1,077,241.0576	2,810,724.0289	833.02	829.98
PES-CW-3	1,077,201.4011	2,810,746.9311	835.47	832.61
PES-MW-1	1,077,362.2130	2,810,890.3032	832.49	829.70
PES-MW-2	1,077,352.2659	2,810,878.6781	832.41	829.73
PES-MW-3	1,077,339.7787	2,810,863.0861	832.80	830.06
PES-MW-4	1,077,322.0128	2,810,840.5161	832.57	829.85
PES-MW-5	1,077,284.9770	2,810,784.1402	832.60	829.71
PES-MW-6	1,077,372.8329	2,810,880.5686	832.41	829.70
PES-MW-7	1,077,350.1165	2,810,897.9350	832.58	829.80
PES-MW-8	1,077,358.5313	2,810,860.6699	832.64	829.84
PES-MW-9	1,077,337.0208	2,810,878.0602	832.85	830.12
PES-INJ-1	1,077,383.5294	2,810,894.6650	832.42	829.58
PES-INJ-2	1,077,371.1601	2,810,902.3448	832.87	829.91
PES-INJ-3	1,077,357.9781	2,810,909.5938	832.71	829.98
PES-BG-1	1,077,399.3260	2,810,906.2155	832.75	829.88
PES-BG-2	1,077,370.1213	2,810,927.8737	832.73	829.70
PES-BG-3	1,077,374.9384	2,810,942.4126	832.56	829.72
PES-MW-10A	1,077,342.3297	2,810,904.4668	832.17	830.02
PES-MW-10B	1,077,345.3464	2,810,906.3567	832.11	829.87
PES-MW-11A	1,077,320.3398	2,810,900.3860	832.28	830.10
PES-MW-12A	1,077,205.4348	2,810,881.8568	833.89	831.64
PES-MW-12B	1,077,208.6827	2,810,882.5631	833.80	831.52
PES-MW-13A	1,077,420.0024	2,810,927.9904	832.15	829.75
PES-MW-14A	1,077,291.9775	2,810,872.9834	831.74	829.76
PES-MW-14B	1,077,295.6864	2,810,871.9715	831.84	829.71

Information on the pilot test wells is provided for information purposes only. To date, these have not been incorporated into the water level measurements or annual sampling programs.

2004 Annual Monitoring Report
Naval Industrial Reserve Ordnance Plant
Fridley, Minnesota

CTO 0366

November 2005

Comprehensive Long-term Environmental Action Navy

CONTRACT NUMBER N62467-94-D-0888

11/05

2004 Annual Monitoring Report

Naval Industrial Reserve Ordnance Plant
Fridley, Minnesota

Contract Task Order 0366

November 2005

NAVFAC
Naval Facilities Engineering Command
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, South Carolina 29406

TETRA TECH NUS, Inc.

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TABLES

NUMBER

FIGURES

NUMBER

FIGURES (CONTINUED)

NUMBER

ACRONYMS

ACP	Anoka County Riverfront Park
AER	Air Emission Rate
AMR	Annual Monitoring Report
bgs	Below Ground Surface
CD	Combined Discharge
COC	Contaminant of Concern/Chain of Custody
°C	Degree Celsius
1,1-DCA	1,1-Dichloroethane
1,2-DCA	1,2-Dichloroethane
1,1-DCE	1,1-Dichloroethene
1,2-DCE	1,2-Dichloroethene
DMR	Discharge Monitoring Report
DNAPL	Dense Nonaqueous-Phase Liquids
DO	Dissolved Oxygen
DQO	Data Quality Objective
ERR	East River Road
FIG	Franconia/Ironton/Galesville
FFA	Federal Facility Agreement
GC/MS	Gas Chromatography/Mass Spectrometry
GIS	Geographic Information System
GMS	Groundwater Modeling System
GPM	Gallons Per Minute
GWTF	Groundwater Treatment Facility
LCS	Limit Control Study
LCSD	Limit Control Study Duplicate
LTM	Long-Term Monitoring
LTO	Long-Term Operation
MCES	Metropolitan Council Environment Services
MCL	Maximum Contaminant Level
MDL	Minimum Detection Level
MDH	Minnesota Department of Health
MHF	Mount Simon/Hinckley/Fond du Lac
MIP	Membrane Interface Probe

MK	Morrison Knudsen
MPCA	Minnesota Pollution Control Agency
MS	Matrix Spike
MSD	Matrix Spike Duplicate
msl	Mean Sea level
MWW	Minneapolis Water Works
NIROP	Naval Industrial Reserve Ordnance Plant
NPDES	National Pollutant Discharge Elimination System
OU	Operable Unit
PC	Prairie du Chien
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethene
PE	Polyethylene
PLC	Programmable Logic Controller
PVC	Polyvinyl Chloride
O&M	Operation and Maintenance
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAB	Restoration Advisory Board
RAMP	Remedial Action Monitoring Plan
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
RMS	Root Mean Square
ROD	Record of Decision
SCE	Stripping Column Effluent
SDR	Special Discharge Reports
SDS	State Disposal System
1,1,1-TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
TtNUS	Tetra Tech NUS, Inc.
ug/L	microgram per Liter
UDLP	United Defense Limited Partnership
umhos/cm	Measure of Conductivity (not an acronym)
USACE	United States Army Corps of Engineers
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey

VOCs	Volatile Organic Compounds
YSI	Field Instrument Manufacturer (not an acronym)

3.0 SUMMARY OF OPERATION AND MAINTENANCE

3.1 OPERATION AND MAINTENANCE RESPONSIBILITY

The U.S. Army Corps of Engineers (USACE) was responsible for the O&M of the complete groundwater extraction and pretreatment system from startup of the system in September 1992 through April 12, 1993. On April 13, 1993, UDLP (formerly FMC Corporation - Naval Systems Division) assumed responsibility for O&M of the remediation system through mid-1999. During this time, UDLP arranged service contracts with other companies for monitoring and preventative and emergency maintenance of the system. From mid-1999 until April 13, 2000, Morrison Knudsen (MK) acted as the general O&M contractor to the Navy. Since April 13, 2000, Bay West, Inc. has acted as the general O&M contractor to the Navy.

3.2 OPERATION AND MAINTENANCE RECORDS

The O&M data that have been gathered to document the O&M of the remediation system are summarized in the monthly Bay West Treatment System Reports (Appendix B). This includes the following items (if available in this report, the location is noted in parentheses):

- Key maintenance and repair activities for all extraction well and pretreatment system components (Appendix B).

- Readings of instantaneous flow rates from individual extraction wells and cumulative groundwater flow volume pumped since startup (Appendix B).

- Water-level readings at all monitoring wells, extraction wells, and the river (Appendix C).

- Results of visual checks of equipment, piping, instrumentation, and controls operation.

O&M contractor representatives typically present summaries of O&M activities at the Restoration Advisory Board (RAB) meetings, which are held by the Navy several times each year. RAB members are representatives of the local community interested in the environmental conditions at the NIROP facility. The RAB meetings provide a mechanism to educate the RAB members on the current environmental conditions and the progress of remediation activities at the facility. The meeting notes issued to attendees include brief summaries of the O&M remediation progress. These meeting notes can be referenced to supplement the O&M records included in Appendix B of this report. Bay West has provided an O&M summary at each RAB and project team meeting since their involvement began in April 2000.

3.3 EXTRACTION WELLS AND PUMPS

Groundwater extraction wells have operated nearly continuously since start-up in September 1992. Temporary shutdown of individual wells or of the complete well system has been necessary for regular or repair maintenance of the wells, piping, or pretreatment system on various occasions. Logs of the operating status of the extraction wells and pumps and records of maintenance tasks are maintained by the O&M contractor (currently, Bay West Inc.). A summary of maintenance performed on the wells and pumps in 2004 is included in the O&M monthly reports (Appendix B). Bay West has contracted with E.H. Renner & Sons, a licensed well driller, to provide assistance with the regular maintenance of the extraction wells and pumps.

Procedures have been developed and implemented by the O&M contractors to clean the extraction wells, pumps, and piping system to control the buildup of scale and other materials in the system. The O&M records indicate that the maintenance procedures have been moderately successful in maintaining the flow rates. Regular inspection and maintenance of the system components have proven to be important and necessary to maintain the total flow rate from the combined extraction well system at optimum operating conditions.

The 2004 operational effectiveness and pumping rate information for each extraction well are summarized in Table 3-1. Figures 3-1 through 3-7 show the 2004 daily pumping rates for extraction wells AT-3A through AT-10. It should be noted that corrections were made to the daily flow rates provided by Bay West for AT-5A (12/1/04) and AT-7 (7/11/04). The original rates were outside the upper bounds of the well's pumping rates and the anomalous results are likely the result of problems with the flow meters. From the table and figures it can be seen that significant operational issues occurred during 2004 for 3 out of the 7 extraction wells. Operational efficiencies ranged from 56 percent to 67 percent for the 3 wells (AT-7, AT-8, and AT-10), which is an improvement compared to their efficiencies in 2003. The remaining four wells (AT-3A, AT-5A, AT-5B, and AT-9) operated at efficiencies in the range of 82 to 85 percent, which is a more significant improvement compared to their efficiencies in 2003, which ranged from approximately 55 to 60 percent. Comparison of the average pumping rates of the pumps during the operational time to their as-built capacities (provided in Table 3-1) shows that five of the seven pumps operated at 74 to 90 percent of their as-built capacity, with the exception of pumps installed in AT-5B and AT-10. These latter two pumps appear to have pumped higher than their as-built capacities.

The effectiveness of the extraction system was impacted by periodic shutdowns for cleaning to maintain optimal flow rates in some wells. In addition, the extraction system was shut down for several extended

periods in 2004 for maintenance and repair operations. The specific maintenance and repair issues that interrupted operation of the extraction wells and the durations of the interruptions are documented in Table 3-2. A summary of the global maintenance and repair issues that affected the overall performance of the extraction system are provided below. More detailed information regarding maintenance and repair of the extraction system is provided in Appendix B.

- Extreme cold weather in January 2004 caused the PVC pipes supplying air to the air strippers ASU-202 and ASU-204 to shrink more than the allowable adjustment to the hose clamps on the Fernco couplings, leading to shutdown of the system caused by loss of air pressure. The problem was rectified using screws to secure the connections.

- The data logger in monitoring well MS-41D was removed and sent for service in January 2004. A new data logger was installed in April 2004.

- The flow meter for AT-7 faulted out on several occasions during the year, and after repeated investigations, it appears that the problem may not have been completely resolved. Initially, the wiring was suspected to be the cause of the problem, which was found to be okay. Then, he transmitter was shipped to Rosemount/Emerson Process Management, who notified Bay West that the transmitter sensor module had failed, and owing to its obsolete nature, recommended a new equivalent replacement part. The part was replaced on March 2, 2004, and reported to have been functioning normally, however, the flow meter faulted out again in June and July. A recommendation was made in November 2004 for further investigation of the possibility that air bubbles may be interfering with the sound speed readings.

- Decreasing flow rates in AT-8 and AT-9 during December 2003 and January 2004 prompted Bay West on January 16, 2004 to attempt to clear restrictions in the piping from these wells to Building 52/53. Compressed air was forced through the pipe connected to AT-9 until the water clarity improved; however, the flow remained at 121.5 gpm, instead of the expected (as-built) pumping rate of 150 gpm. The pipe connected to AT-8 could not be cleared because the air connection had frozen solid with ice.

- Flow rate from AT-9 continued to decline in February. Bay West's contract was modified to include the removal and cleaning of several extraction well pumps and to redevelop several extraction wells. (TtNUS notes that the February monthly report does not specify which well pumps or how many pumps were required in the contract modification).

- The effluent pumps P-301A and P-301B were removed from the site, disassembled, sand blasted, and given a Teflon coating. Flow meters for ASU-204 and ASU-201 malfunctioned because of suspected failure of transducers.

- During March 2004, the system was shutdown for well redevelopment and cleaning for bacterial and iron fouling. Communication between the PLC 5/11 in Building 52/53 and the main PLC failed because of a suspected electrical storm. A replacement PLC processor and surge suppressors were installed on April 28, 2004. The two surge suppressors were installed in the communication line between the PLC processor in building 52/53 and the PLC processor in the treatment area. Two additional surge suppressors were installed on June 3, 2004 in the communication line between the remote input/output line between the PLC processor in the treatment plan and the remote input/output rack in Building 52/53. Leakage of acid to the effluent sump (S-301) occurred during cleaning of airstrippers, which was rectified by neutralizing, filtering and removing the cleaning solution.

- Polymer dosage was increased in an attempt to reduce the potential for iron and calcium fouling.

- The float balls and flapper valves that control the flow from the sumps of air strippers ASU-201, ASU-202, ASU-203, and ASU-204 were replaced to allow adequate flow of treated water. The flow meter for ASU-203 was replaced because of a faulty transducer.

- Extraction wells AT-3A, AT-5A, AT-8, and AT-9 were redeveloped using Design Water Technologies' Unicid Acid and Catalyst system to treat the iron bacteria fouling the wells. The extraction pump AT-7 was also cleaned during the process. The drop pipe for AT-10 was lowered to approximately 70 feet below ground surface. After the system was restarted, compressed air was forced through the pipes connected to AT-3A, AT-5B, AT-7, AT-8, and AT-9, in order to scour the interior and dislodge any accumulated material. The well redevelopment work was done by E.H. Renner and Sons, Inc., and Bay West Personnel.

- A faulty relay switch on pump AT-5A was rectified.

- The flow meter for AT-10 was not registering the pump operation and consequently the computer controlling the pump shut it down. The flow meter was removed and sent to the manufacturer after all attempts for onsite troubleshooting failed.

- Data loggers in MS-36D and MS-37S were removed and sent for servicing in August 2004. Data loggers were replaced in these wells in September 2004.

- The polymer feed pump for water pretreatment faced continual problems with its automatic controls, and therefore, needed to be operated in manual mode until repairs could be made.

- Flow rates from AT-7 and AT-8 were below design criteria. Water was noted to be cascading down the well from the pump in AT-7, and suggested the need for redevelopment of the well. Surging the flow through the discharge pipe appeared to alleviate the deficient flow rate in AT-8, suggesting that significant fouling may have occurred. As noted in Table 3-1, fouling of the pipes from AT-7 and AT-8 caused significant reduction in flow rates over extended durations. These two wells faulted out in November 2004 because of suspected fouling, and redevelopment was recommended.

- Flow rates from AT-5A, AT-5B, and AT-9 were also noted to be below design criteria. Replacement of the pumps in AT-5A and AT-5B was recommended, and pump replacement with redevelopment of AT-9 was recommended. The December 2005 monthly report states that the pump information for AT-5A included in the project records is in conflict with its performance. (TtNUS notes that no details were given pertaining to what pump or what performance parameters of the pump were in conflict; it is surmised that the report refers to the conflict between as-built and actual flow rates).

- The effluent flow meter was noted to be operating intermittently because of faulty transducers. Replacement of the transducers did not rectify the problem until a change of the type of transducer was made.

- Routine maintenance consisting of lubrication of motors, checking for vibration damage and wear and replacing appropriate parts of pumps, observations of signs of overheating, etc. were conducted.

- Faulty readings from ASU-201 and -202 were noted, and transducers were replaced.

Except as noted above, the extraction well system and treatment system were restarted under normal operating conditions (i.e., all extraction water was treated and discharged according to project requirements).

TABLE 3-1

SUMMARY OF OPERATIONAL EFFECTIVENESS AND PUMPING RATE INFORMATION FOR EXTRACTION WELLS
2004 ANNUAL MONITORING REPORT
NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
FRIDLEY, MINNESOTA

Extraction Well	Operational Effectiveness			Pumping Rate Information			Comments
	Days Pump was Operational in 2004[1]	Operational Percentage During 2004	Total Volume Pumped in 2004[2] (million gallons)	Design Pumping Rate (gpm)	As-Built Pumping Rate (gpm)	Actual 2004 Running Rates[3] (gpm)	
AT-3A[4]	310	84.9%	79.0	245[7]	245[7]	168-200	Screened interval was reduced in 2001 from 69-130 feet to 69-105 feet. Improved operation and maintenance over 2003.
AT-5A[5]	300	82.2%	60.4	175	187	138-152	Improved operation and maintenance over 2003.
AT-5B[6]	311	85.2%	36.7	70	70	71-90	Improved operation and maintenance over 2003.
AT-7[5]	219	60.0%	12.4	45	57	17-59	Continued operation and maintenance issues. Iron fouling problems.
AT-8[5]	203	55.6%	5.6	31	15	9-19	Continued operation and maintenance issues. Iron fouling problems.
AT-9[5]	302	82.7%	55.9	78	150	110-158	Improved operation and maintenance over 2003.
AT-10[4]	244	66.8%	11.3	30	20	24-39	Continued operation and maintenance issues.

Notes:

1. Total number of operational days was provided by Baywest correspondence.
2. Total volume for each extraction well can be found in 2004 DNR Annual Report of Water Use found in Appendix B-2.
3. Actual running rates are the typical (not comprehensive) range over which the well operated during 2004.
4. Intermediate and Deep Aquifer Zones.
5. Shallow Aquifer Zone.
6. Deep Aquifer Zone.
7. Actual design and as-built pumping rates are unknown due to the screen modifications of this well.

RESPONSE TO COMMENTS
2004 ANNUAL MONITORING REPORT DATED MARCH 31, 2005

MPCA Comments

1. **Comment: Section 4.4, Surface Water and Water Work Intake Monitoring Data, page 4-39, second to last sentence.**

   While the statement is true with regard to this Mississippi River surface water sampling in 1999, the statement does not reflect the updated method used to evaluate impacts to the Mississippi River based on the surface water compliance wells selected to evaluate discharges of the Naval Industrial Reserve Ordnance Plant (NIROP) contaminant plumes to the river that are reflected in the Five-Year Review ("Review") for Operable Unit 1, dated October 31, 2003. The Minnesota Pollution Control Agency (MPCA) staff requests that the Navy add a discussion that evaluates the surface water impacts to the Mississippi River for the reporting period based on the data cited in Table 4-9.

   Response: A new second paragraph will be added to Section 4.4, reiterating information provided in sections 4.3.2.3 through 4.3.2.5:

   In the CERCLA Five-Year Review for Operable Unit 1, dated October 31, 2003, the Navy agreed to continue sampling and reporting data from the surface water compliance wells, with a comparison of the results to determine whether or not surface water TBCs for the Mississippi River are met prior to plume discharge to the river, versus future surface water sampling. This comparison is provided in Table 4-9 and indicates that TCE was detected in five out of six shallow unconfined aquifer compliance wells at concentrations that exceed Minnesota surface water screening criteria. TCE was detected above these criteria in the five intermediate unconfined aquifer monitoring wells, and 1,2-DCE was detected in one well above it's criteria. TCE (in three wells) and PCE (in three wells) were detected above the criteria in the lower semi-confined (deep) aquifer.

2. **Comment: 6.1 SUMMARY AND CONCLUSIONS, General Observations, page 6-2, bullet 2**

   The MPCA staff's position regarding the allocation of responsibility in the southern portions of the Anoka County Park (ACP) plumes was outlined in the MPCA staff response to the 2001 Annual Monitoring Report (AMR) as follows:

   > The MPCA does not endorse any representations of the data regarding NIROP versus UDLP contamination in specific wells at this time. As stated in the text it is anticipated that the issue of commingled plumes will need to be determined among the regulatory agencies the Navy and UDLP.

   The MPCA staff has identified the need for all parties to be involved in resolution of this issue and this remains the MPCA staff position on the issue. If and when the Navy wishes to resolve this issue, the Navy should initiate meetings with the Navy, United Defense, L.P. (UDLP), MPCA and U.S. Environmental Protection Agency (U.S. EPA) to resolve the issue

   Response: No response required. No revision to the report is required.

3. **Comment: 6.1 SUMMARY AND CONCLUSIONS, General Observations, page 6-2, bullet 3**

The MPCA staff's position on capture has been articulated in past MPCA staff responses to AMRs. Our modification regarding the capture issue in the MPCA staff response to the 2003 AMR states:

> **Section 6.1, SUMMARY AND CONCLUSIONS, General Observations, page 6-2, bullet 2**
>
> Statements regarding containment should reflect the consensus reached by the Technical Subcommittee in Minneapolis. At that meeting it was agreed that there appeared to be relative confidence in shallow interval capture but that there was uncertainty regarding capture in the intermediate and deep aquifer zones.
>
> There is currently a work plan to install monitoring wells to better define capture in the intermediate zone. Further monitoring is proposed to assist in evaluation of deep zone capture. The MPCA staff requests that the statement be modified to reflect the current agreements regarding capture.

The MPCA staff believes this statement accurately describes the current status of NIROP Technical Advisory Subcommittee's understanding regarding the capture issue. Monitoring wells are proposed by the Navy to help perform capture analysis particularly in the intermediate and deep aquifers. The need for this work was a recommendation of the NIROP Technical Advisory Subcommittee when the group met to discuss the United States Geological Survey (USGS) capture evaluation report. That report has not been finalized pending the completion of the installation of additional monitoring wells and piezometers (proposed by the Navy in both the 2003 and 2004 AMR reports) and pumping tests to be performed when the wells have been installed. Until this data can be evaluated by the Technical Advisory Subcommittee and agreement reached on interpretations of the data, the USGS capture evaluation is considered by MPCA staff to be in draft form.

Response: No response required. No revision to the report is required.

4. **Comment: 6.1 SUMMARY AND CONCLUSIONS, Shallow Monitoring Interval, page 6-2, bullet 1, Monitoring Well MS-46S**

The MPCA staff has made an issue of the construction of monitoring well MS-46S in modifications to the Vegetable Oil Work Plan and has requested that the well not be used to monitor the pilot test results. An alternative monitoring well was requested (and installed) to replace monitoring well MS-46S. The modifications (from the November 1, 2004 letter from MPCA staff to the Navy) requested by the MPCA staff in the response to the vegetable oil work plan addendum known as the "Technical Work Plan Addendum," dated October 15, 2004, are noted as follows:

> **PROPOSED EXTENDED MONITORING ACTIVITIES, page 2, bullet 2**
>
> The conceptual cross section indicates that MS-46S is screened through the upper sand, the silt/clay unit, and the sand below the silt/clay unit. Most of the screen is

located in the silty/clay unit, not in aquifer material. As stated in the discussion, it is difficult to determine what interval the volatile organic compounds (VOCs) may be derived from when a ground water sample is collected from this well. The location of the vegetable oil pilot test was selected based largely on the results from this monitoring well. It appears that this well may not be representative of the VOC concentrations in the shallow aquifer, which as been the assumption in the past. The VOC concentrations may be more representative of the VOC adsorbed in the silt/clay or may be a mixture of water derived from with the silt/clay unit and from the semi-confined unit below it. It is difficult to determine with any degree of confidence.

It is evident that the data from this well should not be used to represent VOC concentrations in the shallow plume for the pilot test.

It is also evident that the data from this well should not be used to determine the VOC concentrations in the shallow plume by the Navy as reported in its annual monitoring reports (AMRs) because the well is not screened in the shallow aquifer. The well should be used only for measuring water levels in the future although, since the well is screened both above and below the silt/clay unit, it may be difficult to determine whether or not the water level is an unconfined water level or whether or not there is influence from the semi-confined or confined aquifer below the clay. It is important for the pilot test and for accurate interpretation of the NIROP plumes to clarify where the high VOC concentrations are located in this area of Anoka County Park (ACP). An erroneous data point may lead to errant interpretations of the plume that may also impact interpretations of the vegetable oil pilot test. Recommendations follow regarding monitoring in the MS-46S area.

Soil Boring Installations, page 4

This section discusses that boring PES-SB-1 is expected to be in an area that has not been impacted by the vegetable oil injection. At the technical meeting it was discussed that there was not a good upgradient monitoring well for the test area. The MPCA staff has determined that MS-46S is not a monitoring well that is representative of the aquifer below the silt/clay in which the pilot test is being conducted. Questions still remain as to whether the well was impacted by vegetable oil injection.

The MPCA staff requests that, at the PES-SB-1 location, the boring be used to collect the soil samples as described in the work plan. Once the stratigraphy has been determined, the MPCA staff requests that a monitoring well be installed below the silt/clay layer, if it is present at that location, or at a depth equivalent to the depth at which the vegetable oil was injected. The monitoring well would be considered a non-impacted well (i.e., not impacted by injected oil) and would serve as a well to monitor water conditions in the aquifer upgradient of the test. The MPCA staff requests that the well be sampled as part of the pilot test and water levels be collected for equipotential maps. The MPCA staff requests that this monitoring well would also be sampled as part of the Navy's AMR sampling in the place of MS-46S to monitor the ACP plume and the progress of the ground water improvement from the pumpout system.

The MPCA staff strongly believes that monitoring well MS-46S is not an appropriate well to monitor chemical concentrations (and perhaps water levels as well) in the shallow unconfined aquifer in ACP. The reasons are outlined in the previous discussion. The

MPCA staff strongly believes that the data at the concentrations reported from MS-46S are not representative of the shallow unconfined aquifer in ACP and are more likely strongly influenced by contaminants sorbed onto fine grained sediments through which the well is screened. Monitoring the plume concentrations in the aquifer is the primary reason for ground water monitoring in ACP to determine the effectiveness of the capture system and to determine impacts to the river.

As stated in the previous modification to the vegetable oil work plan addendum, the MPCA staff requests that the Navy sample the newly installed vegetable oil monitoring well at the PES-SB-1 location from the vegetable oil pilot study fro future AMR reports. (The MPCA staff is uncertain of the designation for this well as it has not received the vegetable oil pilot study report). If the Navy feels strongly that the MS-46S location is a valuable one to sample, the MPCA staff requests that the Navy abandon MS-46S according to the Minnesota Department of Health well code and that the Navy install a new monitoring well at this location that is screened entirely in the acquifer material located below the sandy clay layer. The new well would be monitored and the results reported in future AMRs.

Response: The Navy is agreeable to deleting well MS-46S from the AMR sampling network and water level network. The Navy agrees to the substitution of new well at location PES-SB-1 in the place of MS-46S in these networks. The rationale for this change will be included in the 2005 AMR. The RAWP, currently under regulatory review, will be updated accordingly. No changes to the 2004 AMR are required.

5. **Comment: 6.1 SUMMARY AND CONCLUSIONS, Anoka County Park Area, page 6-5, bullet 3**

Please refer to the previous discussion of monitoring well MS-46S. Based on the requested modification cited above, the MPCA staff believes it is inappropriate to use monitoring well MS-46S to characterize the shallow unconfined aquifer in ACP.

Response: As the AMR is produced annually, beginning with the 2005 AMR, the shallow unconfined aquifer discussion will exclude discussion of well MS-46S. No revisions to the 2004 AMR are required.

6. **Comment: 6.2 RECOMMENDATIONS, General Modification**

The MPCA staff agrees in general with the recommendations contained in this section; however, several modifications follow regarding several of the specific recommendations.

Response: See specific items following.

7. **Comment: 6.2 RECOMMENDATIONS, Containment and Extraction Remediation System, pages 6-9 and 6-10, bullet 3**

The idea of installing additional pumping wells near wells where recurring downtime problems exist is an interesting idea. As the Navy knows, extended downtimes reduce the effectiveness of the capture of the plumes. It appears that the upward trends in some of the downgradient monitoring wells in ACP identified in this AMR may be a result of the

movement of contaminants beyond the capture zones of the pumping wells during non pumping conditions. Consistent operation of the system would eliminate this problem.

If and when the Navy considers this option, the MPCA staff requests that the Navy provide a draft strawman proposal. The Technical Advisory Subcommittee should discuss the Navy recommendations regarding which wells might be considered. For each of the wells to be installed, the local geography should be reviewed by the Technical Advisory Subcommittee to determine if there may be more optimal locations for additional wells. The MPCA staff requests that any capture zone field work report be completed and agreed upon by the parties before any additional pumping wells are installed. Also please see the MPCA staff response entitled, "Section 6.2 Recommendations" below.

Response: If and when the Navy pursues this option, the Navy will provide a draft strawman proposal with specific details. Please note that in its current configuration, plant operations would make it difficult to site additional wells at this time.

8. **Comment: 6.2 RECOMMENDATIONS, Containment and Extraction Remediation System, pages 6-9 and 6-10, bullet 4**

The MPCA staff agrees that this recommendation is a good one and requests that the Navy clarify the decision making regarding the recommendation. The recommendation raises MPCA staff concern that there may not be proper monitoring wells (or piezometers) to do a valid and meaningful pumping test of the deep pumping wells. The MPCA staff requests that pumping test guidance of the Navy's choosing be consulting to determine if adequate piezometers are in place to perform the proposed deep well pumping tests. The results of the review should be reported and recommendations made in the Navy response to comments.

Section 6.2, Recommendations

Does the Navy intend to implement recommendations prefaced by use of the word "consider", e.g., the third bullet of the ground water and extraction system recommendations? If the Navy intends to implement a recommendation prefaced the word "consider", the MPCA staff requests that the Navy identify how the recommendation will be implemented and provide a schedule for its implementation. If the Navy does not intend to implement a recommendation prefaced by the word "consider", the MPCA staff requests that the Navy indicate why the recommendation will not be implemented.

Response: Decision making regarding the addition of deep aquifer piezometers and deep pumping well testing is not yet developed. As stated in the bullet, the upcoming pumping test designed by USGS should help clarify the issue. The USGS designed pumping test is scheduled to be conducted during late summer 2005.

The Navy is not currently planning on implementing any of the bulleted items prefaced with 'consider'. The items prefaced with 'consider' are meant to identify potential means of address for potential data gaps or capture system upgrades, if determined necessary following consideration of current and future data. For example, regarding the installation of redundant pumping wells, the operating performance of the system will need to be seen to deteriorate further. Prior to adding deep piezometers, the USGS designed pumping test will need to be conducted, evaluated and reviewed.

No changes to the report are required.

9. **Comment: Section 6.2, Recommendations, Groundwater Water Monitoring Program, RAWP and Change of Sampling Contractor**

As stated in my response of March 17, 2005 to your e-mail message of the same date regarding a change of the Operable Unit I sampling contractor, the MPCA staff reiterates its request that the Navy make the necessary changes to the OU1 Quality Assurance Project Plan ("QAPP") to accommodate a new sampling contractor and receive MPCA and U.S. EPA approval of the updated QAPP before any more OU1 sampling is conducted at NIROP. The Navy is entitled to a reasonable time to update the QAPP. The MPCA staff requests that the Navy provide the MPCA staff with a schedule for updating the QAPP at the earliest opportunity.

Appendices (found on CD):

The MPCA staff believes that any time a detection appears in a blank, be it field or laboratory, the "5x" rule found in the National Functional Guidelines should be applied to the data, e.g., the validation report, dated January 13, 2004, reported a concentration of 0.85 ug/L in the blank; associated data should flag all reported concentrations below 4.25 as non-detect.

The MPCA staff requests that in future AMRs, the following be included in the appendices:

- A report on field audits performed (or performed upon the laboratory), if any;
- Corrective actions taken on site in a specific section with the report, if any;
- Personnel changes on site, if any;
- Quality Assurance Project Plan changes or modifications, if any; and
- A report in the conclusion section that states show the Data Quality Objectives are being met (again, this is somewhat discussed, but not specifically within a section).

Response: The RAWP revision has been available at MPCA for staff review since 10 June, 2005.

In future AMRs, the National Functional Guidelines 5X rule will be applied, or else in specific cases where it is not applied, justification will be provided. No revisions are required for the 2004 AMR.

Starting with the 2005 AMR, the following will be included in the appendices:

- A report on field audits performed (or performed upon the laboratory), if any;
- Corrective actions taken on site in a specific section with the report, if any;
- Personnel changes on site, if any;
- Quality Assurance Project Plan changes or modifications, if any; and
- A report in the conclusion section that states show the Data Quality Objectives are being met (again, this is somewhat discussed, but not specifically within a section).

Commitment made in RTC to MPCA comments on the revised RAWP:

A new Section 4.6 – Attainment of DQOs will be added to each year's AMR starting with 2005. Section 4.6 will present the DQO Decision Statement for Problem B (Determine whether NIROP groundwater contamination is substantially prevented from leaving the NIROP property after startup of new [pumping] wells) and Problem C (If contaminated groundwater (>100 ppb TCE) is migrating beyond the north and south edges of the capture well line along the NIROP compliance line, evaluate potential system enhancements, source control, etc., as appropriate to improve the containment system. If not, optimize the groundwater monitoring system by selecting different pumping rates, deselecting wells from the list of monitoring/pumping, etc. as appropriate, based on best professional judgement using data analysis tools [identified elsewhere in the DQO notes]. It is expected that the discussion developed in Section 4.6 will heavily reference the discussions elsewhere in Section 4.0. The conclusions made in Section 4.6 will also be reported in each AMR Section 6.0 – Conclusions and Recommendations. Note that Navy feels that a thorough evaluation of DQOs is already implicit in Section 4.0; all that changes is that the foregoing process will make it explicit.

USEPA Comments

SPECIFIC COMMENTS

1. **Comment: Table of Contents, Acronyms, Pages 5 through 6:** The list of acronyms does not appear to be complete. Examples of some acronyms that appear to be missing from the list are CAHs, COCs, and EPA. For the purposes of aiding potential non-technical readers, it would be useful to provide a more complete list of acronyms in future submittals.

   Response: The acronym list will be updated and provided with change pages.

2. **Comment: Section 1.5, Potential Source Areas, Page 7:** In the first paragraph of Section 1.5, the text states that Figure 2-1 shows the locations of the source areas discussed in the nine bullets that follow. However, none of the source areas appear to be depicted on the figure. In any future submittals, revise the figure to depict the general locations of potential source areas.

   Response: Some of the potential source areas are not known exactly, or would otherwise be difficult to depict on a single figure. The text already directs the reader to see the RI for additional information, and the sentence telling the reader to see Figure 2-1 will be deleted in future submittals.

3. **Comment: Section 3.3, Extraction Wells and Pumps, pages 2 through 5:** Table 3-2 indicates that each of the extraction wells did not operate during the period from March 26, 2004 through May 4, 2004 due to computer system failure. This significant amount of downtime does not appear to be fully described in Section 3.3 where system interruptions are discussed. More detail is provided in Appendix B, but it would be helpful to have additional description of this event in Section 3.3. In addition, any recommendations for shortening the downtime due to this type of event should be provided.

   Response: The following text will be inserted to replace the third sentence in the second full bulletized item on pg 3-4: (Bullet starts with "During March 2004....."):

   "A replacement PLC processor and surge suppressors were installed on April 28, 2004. The two surge suppressors were installed in the communication line between the PLC processor in building 52/53 and the PLC processor in the treatment area. Two additional surge suppressors were installed on June 3, 2004 in the communication line between the remote input/output line between the PLC processor in the treatment plan and the remote input/output rack in Building 52/53."

   The electrical issues wound up being difficult to diagnose and therefore to resolve, and were not routine in nature. At present, the system operation is being monitored and any recommendations will be based on the performance of the system going forward.

4. **Comment: Figures 4-31 and 4-32, Groundwater Concentration Maps, Intermediate and Deep Drift Groundwater Regimes, and Table 4-8, Detected Concentrations of VOCs, September 2004 Sampling Event:** During an initial review of the groundwater concentration maps and Table 4-8, there appeared to be some inconsistencies between the

maps and Table 4-8. Upon further inspection, it was determined that the results for duplicate samples were averaged before they were entered in Table 4-8. If this was the procedure used for generating Table 4-8, it should be described as a footnote to the table.

It would also be useful for the non-technical reader to define the "J" qualification on each of the groundwater concentration maps. Finally, it was noted that the dates provided for drawing and checking the map were from 2004, prior to the sampling event. These issues should be corrected for any future submittals.

Response: Duplicate sample results were averaged. A footnote will be added to tables in future AMRs when duplicate sample results are averaged to provide the displayed value. No revisions are required to the 2004 AMR for this comment.

The 'J' qualification will be defined on each concentration map where it is used in future AMRs. In addition, drawing and checking dates will be more carefully verified on future maps.