



DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE INDIANA 47522-5001

N00164.AR.000699
NSWC CRANE
5090.3a

IN REPLY REFER TO:

5090
Ser 095/2038
28 JAN 2002

1-1-2002

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Corrective Action Section
Attn: Mr. Peter Ramanauskas (DW-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NSWC Crane) submits, for your review and approval, the Fourth Quarter 2001 Quarterly Interim Progress Report (IPR) for October 1 through December 31, 2001 dated January 2002. Two copies of the report are provided as enclosure (1). Enclosure (2) is the required certification statement.

NSWC Crane point of contact is Ms. Christine D. Freeman, Code 09511, telephone 812-854-4423.

Sincerely,

JAMES M. HUNSICKER
Director Environmental Protection
Department
By direction
of the Commander

Encls:

- (1) IPR 4th QUARTER 2001 (OCT - DEC 2001)
- (2) Certification Statement

Copy to:

Administrative Record
IDEM (D. Griffin)
SOUTHNAVFACENCOM (Code ES324)
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**Naval Facilities Engineering Command
Naval Surface Warfare Center
Crane, Indiana**

**Full-Scale Operations
Soils Bioremediation Facility**

**Quarterly Interim Progress Report
4th Quarter 2001
October 1 – December 31**

**Revision 0
January 2002**

TOLTEC, INC.

QUARTERLY INTERIM PROGRESS REPORT

4th Quarter 2001

October 1 – December 31

Revision 0

January 2002

**FULL-SCALE OPERATIONS
SOILS BIOREMEDIATION FACILITY
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA**

ENVIRONMENTAL JOB ORDER CONTRACT

CONTRACT NO. N68950-96-D-0052

TOLTEST PROJECT NUMBER 37324.01

Submitted to:

OFFICER IN CHARGE OF NAVFAC CONTRACTS

NAVAL SURFACE WARFARE CENTER

CRANE, INDIANA

Submitted by:

**TOLTEST, INC.
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Prepared/Reviewed by:

Project Manager/Environmental Specialist

Peter J. Chevalier

Date

Reviewed/Approved by:

Regional Manager

Lance Parsons

Date

EXECUTIVE SUMMARY

This interim progress report has been prepared by ToITest, Inc. (ToITest) for Southern Division, Naval Facilities Engineering Command. This report documents the progress at the Bioremediation Facility (Biofacility) for treatment of explosives-contaminated soil at the Naval Surface Warfare Center (NSWC) Crane, Indiana. On March 27, 1999, ToITest assumed responsibility for the excavation and treatment of contaminated soil at the Biofacility. This report summarizes the work actions performed from October 1 through December 31, 2001 pursuant to the requirements of the approved *Full-Scale Operational Plan* and the *Quality Assurance Project Plan*. Full-scale bioremediation operations started in April 1998. All interim measures work actions have been performed in accordance with approved plans.

The scope of work includes initial site characterization by sampling and analysis, excavation and screening of explosives-contaminated soil, transportation of screened soil for treatment to the Biofacility, process monitoring and confirmatory sampling of the compost windrows, and disposal of treated soil.

All initial characterization soil sampling, post-excavation soil sampling, and contaminated soil excavation at Mine Fill A (MFA), Mine Fill B (MFB), and Rockeye (RKI) has been completed.

A total of 5 new windrows were constructed during this reporting period: 212 through 216. All windrows achieved Day Last status during this period and all results were below Residential cleanup goals. Windrow N-216 was the last windrow to be formed from contaminated soil excavated at MFA, MFB, or RKI.

A total of 1,142.49 tons of contaminated soil from MFB and 18.1 tons from MFA Battery Site were treated during this time period, all to residential cleanup goals.

High rainfall amounts received at the Biofacility required special water control measures to be implemented to prevent overflow of the retention ponds. On two occasions the retention pond valves were opened to allow pond water to flow into the adjacent drainage ditch and prevent an overflow of the ponds.

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Figure 2	RKI Grid and Windrow Location Map

Appendix A

Retention Pond Water Analytical Data Sheets

1.0 INTRODUCTION

This interim progress report has been prepared by TolTest for the Southern Division, Naval Facilities Engineering Command to document the progress of the full-scale bioremediation operation of explosives-contaminated soil at NSWC Crane, Crane, Indiana. It summarizes the work actions performed by TolTest during the period July 1 through September 30, 2001 pursuant to the requirements of the approved *Full-Scale Operational Plan (FSOP)* [MK, 1998a] and the *Quality Assurance Project Plan (QAPP)* [MK, 1998b]. Full-scale bioremediation operations started in April 1998. TolTest assumed responsibility on March 27, 1999 from Morrison Knudsen Corp. (now Washington Group International, WGI) after the completion of their contract.

NSWC Crane, located in southwestern Indiana, provides support for equipment shipboard weapons systems, and ordnance. This site also supports Crane Army Ammunition Activity, which includes production and renovation, storage, shipment, and demilitarization and disposal of conventional ammunition. Explosive-compounds contaminated soils resulting from the above operations have been identified at four solid waste management units (SWMUs): Ammunition Burning Ground (ABG, SWMU-03/10); Rockeye Munitions Facility (RKI, SWMU-10/15); Mine Fill A (MFA, SWMU-12/14); and Mine Fill B (MFB, SWMU-13/14). No work has been performed at ABG pending the outcome of a risk assessment study.

On-site bioremediation of the high-explosives contaminated soil utilizing a windrow composting process has been selected as the preferred treatment alternative for the Interim Measures at these four SWMUs.

The scope of work includes initial site characterization by sampling and analysis, excavation and screening of explosives-contaminated soil, transportation of screened soil for treatment at the Biofacility, process monitoring, confirmatory sampling, disposal of treated soil, and site restoration. All of this work at MFA has been completed and has been included in the Interim Measures Report for MFA prepared by WGI.

2.0 EXCAVATION SITE ACTIVITIES

Work activities at the excavation site may include in-process sampling and screening, pre and post-excavation sampling, soil excavation, soil screening, and vegetation establishment. Fieldwork activities are performed in accordance with procedures included in the *FSOP* [MK, 1998a] and the *QAPP* [MK, 1998b]. Final drawings showing grid locations, post-excavation sample locations, and extent of excavation will be included in the Interim Measures Report for Bioremediation.

2.1 Pre-Excavation Soil Sampling

Pre-excavation sampling is performed to provide initial site characterization and delineate the extent of contamination. The horizontal boundaries of contamination are influenced by the presence of buildings, roads, railroad tracks, and grids with either no detectable levels of contaminants or levels that are below the cleanup goals.

All pre-excavation sampling at MFA, MFB, and RKI was completed prior to this reporting period.

2.2 In-Process Excavation Soil Sampling

All field screening of in-process excavation soil samples for MFA, MFB, and RKI was completed prior to this reporting period.

2.3 Post-Excavation Soil Sampling

All post-excavation samples for MFA, MFB, and RKI were obtained prior to this reporting period.

2.4 Soil Excavation and Screening

Soil excavation operations at all three SWMUs are now complete. All contaminated soil to be processed at the Biofacility has been excavated, screened, and processed at the Biofacility. Full-scale operations soil excavation quantities can be found in Table 1.0.

3.0 BIOFACILITY OPERATIONS

Treatment of high-explosives contaminated soil by composting involves microbial degradation of the explosives by optimizing the availability of organic material, temperature, moisture content, pH, and oxygen. The composting operation process description is provided in Section 5.0 of the approved *FSOP* [MK, 1998a].

3.1 Amendments

The compost mix used in full-scale operations consists of 25% soil, 15% chicken manure, and 60% straw by volume. A sufficient volume of straw and chicken manure has been delivered to satisfy the straw requirements for processing the remaining soil from MFB.

3.2 Windrow Construction and Treatment

Field screening is performed at least weekly to monitor RDX levels within each windrow. Field screening of treated compost for TNT is not completed since RDX is a better indicator of contaminant degradation than TNT. Final compost samples are collected once the field test kits indicated RDX levels are below industrial clean-up goals. The day that final compost samples are collected for off-site laboratory confirmation analysis is referred to as Day Last. The process schedule for windrows processed in this reporting period is included as Table 2.

Windrows 212 through 216 were formed in this reporting period, totaling 1,160.5 tons of contaminated soil. Of this, 1,142.49 tons was from MFB and 18.01 tons was from the MFA Battery Site Cleanup. The MFA soil was mixed into windrow N-214. Each windrow was formed with an estimated 232.1 tons of soil.

Average analytical results for Day Last samples from windrows 212 through 216 were below residential cleanup goals, as shown in Table 3. The average Day Last explosive levels for the windrows listed in Table 3 are listed in Table 4.

3.3 Retention Pond Water Control

On several occasions during this reporting period the retention ponds at the Biofacility threatened to overflow due to high volumes of rain and the inability to pump excess water into the Crane sewer system (the sewer system was at capacity). In order to prevent an overflow of Pond 2 on October 15 and 16, approximately 100,000 gallons of water from Retention Pond 2 were hauled to a nearby sewer access manhole and dumped into the sewer. To prevent an overflow of Retention Pond 1 on October 23, 9,000 gallons of water was pumped into storage

tanks. This water was eventually dumped into the Crane sewer system through the Biofacility sewer lift station. On November 9, 12,000 gallons of Pond 2 water was pumped into the Biofacility lift station.

On November 29, both ponds were within inches of full capacity and heavy rain was forecast overnight. NSWC Crane Environmental Protection Department personnel informed ToITest's Environmental Specialist to obtain a sample of both ponds for off-site analysis and to open the discharge valve to both ponds slightly and leave them open overnight. The pond valves were opened to prevent water from flowing over the top of the ponds and possibly undermining the pond liners. Both pond valves were opened 3/8 of a turn to allow a trickle of water to flow from the pipe and into the adjacent drainage ditch. The discharge rate was later measured to be approximately 0.75 gallons per minute.

Upon arrival the following morning, the flow from the Pond 1 discharge pipe had stopped. Apparently the pipe had become blocked some time during the night and therefore an unknown quantity of water had flowed from the pond. The level of the water in the pond at that time was about three inches below capacity and there was no evidence that the pond had overflowed during the night. The discharge pipe from Pond 2 however was still flowing, so that during the 11 hours it was opened, approximately 495 gallons of water exited the pond. Pond 2 was just at capacity and it was highly likely that it had overflowed during the night. Since it was still raining and to prevent further overflows, the discharge pipe to Pond 2 was opened fully for 20 minutes. The flow rate was calculated to be 55 gallons per minute so that in the 20 minutes it was opened, 1,100 gallons of water exited the pond into the drainage ditch. A total of 1,595 gallons were discharged during this event from Pond 2.

Both ponds were again overflowing on December 17 due to heavy rains. Both pond valves were opened fully for three hours allowing 9,900 gallons from each pond to drain into the ditch. A sample of each pond was obtained from the discharge pipe for off-site analysis.

Analytical results of the pond water samples obtained on November 29 and December 17 are provided in Table 5. Results indicate that samples RPW-086, 087, and 088 exceeded surface discharge limits for RDX. HMX and RDX were detected in RPW-089 at very low levels that were reported as an estimate by the laboratory. Analytical data sheets are provided in Appendix A.

4.0 ANALYTICAL DATA INTERPRETATION AND VALIDATION

All windrow results represent an average of 15 individual data points (five cross sections, three sample locations per cross section). Day Last results demonstrates the effectiveness of the bio-degradation process.

All data associated with windrow monitoring was verified, and at least 10% of the samples were validated and compared with field and laboratory quality control (QC) sample data to assess the data's usability for supporting full-scale operations. Data was verified by reviewing chain-of-custody forms, sample preservation records, analytical holding times, requested turnaround times, sample data in comparison to QC data, and reporting requirements. In addition, more than 10% of the data was validated using the validation procedures specified in Section 9.2.2 of the *QAPP*.

Analytical results for the trip blanks, field blanks, equipment rinsates, and field duplicates were evaluated to identify potential sources of error introduced during sampling, transportation and storage. Field QC performed with the monitoring of windrows has been performed according to the requirements defined in the *QAPP*.

Laboratory QC consists of method blank, sample matrix spike (MS), sample matrix spike duplicate (MSD), surrogate, laboratory control sample (LCS), and laboratory control sample duplicate (LCSD) analyses to evaluate laboratory accuracy and precision. Laboratory quality control was performed consistent with the requirements of the *QAPP*. Method blanks, LCS, LCSD, MS/MSD, and surrogates were acceptable in every analytical batch. Comparing the analytical reporting limits to the industrial and residential clean-up levels, the data is determined to be acceptable to show that clean-up goals have been successfully met.

Based on technical review of the field and laboratory QC data, analyses were performed within acceptable accuracy and precision requirements specified in the *QAPP*. The confirmation data meets the project's data quality objectives and are therefore considered usable to support full-scale operations.

5.0 DISPOSITION OF TREATED SOIL AND SITE RESTORATION

Treated soil (compost) is transported back to the SWMU of origination either to the temporary staging area, the permanent storage areas, or used as backfill in the open excavations. Disposal activity is shown in Table 2. Site restoration (seeding, mulching, and watering) has been or will be implemented at all areas where ToI Test has backfilled treated soil.

The original Control windrow, which was determined to contain PCBs, was moved from the Biofacility and placed in the bottom of grid 149 at the MFB screener site (Figure 1). The new Control windrow (for RKI soils) was placed in grid 16 at RKI (Figure 2).

Windrows 201, 209, 210, 211, and 213 were moved to the MFB screener site, and 212, 214, 215, and 216 were moved to the MFB Permanent Placement Area (PPA) (Figure 1). Windrow M-185, which had been staged at the MFB Staging Area, was moved from the staging area to the MFB screener site.

6.0 STATUS OF VARIOUS REPORTS

The Supplemental Toxicity Report for toxicity sampling carried out in November of 2000 has been reviewed by EPA. A response to comments is due to the Navy in January of 2002. The Pilot-Scale Treatability Report for Rockeye Soils and the Windrow M-203 Batch Report have been approved by the EPA. A draft of the Toxicity Report for Rockeye Soils is due to the Navy in January of 2002. The Interim Measures Report (IMR) for RKI Soils is due to the Navy by March 4, 2002 and the IMR for MFB Soils is due to the Navy by June 3, 2002.

7.0 QUALITY CONTROL

Quality control inspections included excavation site operations, composting operations, sampling activities, field test kit analyses, and facility maintenance. Quality control checks were performed at required intervals using the field inspection checklists provided in Appendix F of the approved *Full-Scale OP* [MK, 1998a]. Copies of all inspection records are maintained at the Biofacility office.

During this period 145 individual items were verified and no deficiencies were identified. Immediate actions were taken to correct any minor findings observed.

8.0 SAFETY AND INDUSTRIAL HYGIENE

8.1 General Safety

During this period 4,007.5 man-hours were expended by ToITest. There were no OSHA recordable injuries. The project has a cumulative total of 69,728.0 man-hours by the end of this reporting period.

Ten formal safety inspections were performed during this quarter. No significant findings of an imminent or serious nature were found. Immediate actions were taken to correct any minor findings observed. Daily informal walk-around safety inspections reinforced and improved the workers safety performance.

8.2 Industrial Hygiene Sampling

No airborne monitoring for ammonia was performed during this reporting period and no explosives monitoring was conducted due to the low volume of work at the Biofacility. Previous sampling events have indicated that elevated ammonia levels are encountered during the early stages of a windrows' life cycle. The chicken manure amendment is the primary contributor to ammonia concentrations. Full-face air purifying respirators with ammonia cartridges are worn during windrow formation and during composting activities when ammonia levels are 25 ppm (TLV) or above. Ammonia is typically localized near each pile and is significantly affected by natural ventilation of the building, moisture in the windrow, and turning of the windrow.

Previous sampling events have indicated that airborne explosives compounds do not pose a significant health hazard.

No wipe sampling for explosive residues was performed at the Biofacility during this reporting period due to the low volume of work performed at the facility. Previous sampling events have indicated that explosives contamination is not detected outside the exclusion zone when the proper decontamination procedures are followed.

No noise monitoring was performed during this quarter. Prior monitoring has concluded that associates are required to wear hearing protection while working around heavy equipment, which is when noise levels are likely to exceed 85 dBa during a weighted network steady state, or 140 dBa impulse, regardless of the duration of exposure.

9.0 FACILITY MAINTENANCE AND REPAIRS

The following maintenance and repairs were performed during this reporting period:

- Repaired hydraulic lines and changed oil on the Ford tractor
- Performed maintenance on the tub grinders
- Repaired the belt on one of the live-bottom trailers
- Changed oil in the SCARAB, front-end loader, skid-steer loader, and both Sterling dump trucks
- Repaired hydraulic hoses on the front-end loader
- Decontaminated both Mack trucks and live-bottom trailers, one of the tub grinders, three storage tanks, the John Deere tractor, and the front-end loader.
- Cleaned (but not decontaminated) the Middle and South compost buildings
- Decontaminated the soil screening equipment and conveyors

10.0 REFERENCES

- MK, 1998a. *Full-Scale Operational Plan for Soils Bioremediation Facility, NSWC Crane, Crane, Indiana*. Delivery Order Number 0009, Contract Number N62467-93-D-1106. Prepared by Morrison Knudsen Corporation, Environmental Services Group. Revision 2, March 12, 1998.
- MK, 1998b. *Quality Assurance Project Plan for Full-Scale Operations, Soils Bioremediation Facility, NSWC Crane, Crane, Indiana*. Delivery Order Number 0009, Contract Number N62467-93-D-1106. Prepared by Morrison Knudsen Corporation, Environmental Services Group. Revision 2, March 12, 1998.

TABLES

TABLE 1.0
FULL-SCALE OPERATIONS SOIL EXCAVATION QUANTITIES
October through December 2001
Quantity (Tons)

Period	Mine Fill A	Mine Fill B	Rockeye	MFA Battery	Cumulative
Previously reported	21,045.39	22,115.20	1,272.68	18.01	44,451.28
October	0.00	0.00	0.00	0.00	44,451.28
November	0.00	0.00	0.00	0.00	44,451.28
December	0.00	0.00	0.00	0.00	44,451.28
Reporting Period Total	0.00	0.00	0.00	0.00	0.00
Site Totals	21,045.39	22,115.20	1,272.68	18.01	

**TABLE 2
WINDROW PROCESS SCHEDULE**

Windrow #	Start Date	Day Zero	Day Last	Lab Results Received	Complete Unload	Ton Processed	Soil Qty Ton Processed	Processed to Residential or Industrial Levels	Compost Disposal Location	Grid Disposal Locations
M-185*	8/30/00	8/30/00	7/31/01	8/8/01	10/3/01	232.1	PR	Residential	MFB B-153	72,73,74, 85,86,87
S-201	1/25/01	1/26/01	3/14/01	3/20/01	10/2/01	116	PR	Residential	MFB B-173	72,73,74, 86,87
RKI Control (w/PCBs)	6/11/01	6/11/01	Na	Na	10/2/01	Na	Na	Na	MFB B-153	149
New RKI Control	8/10/01	8/10/01	9/4/01	9/25/01	10/2/01	15	34,435.0	Residential	RKI B-2733	16
M-209	8/27/01	8/28/01	9/18/01	10/8/01	10/8/01	232.1	34,667.1	Residential	MFB B-153	85,86,91,92, 149,150
M-210	8/28/01	8/30/01	9/19/01	10/12/01	10/17/01	232.1	34,899.2	Residential	MFB B-173	90,148,152
S-211	9/5/01	9/6/01	9/24/01	10/11/01	10/17/01	232.1	35,131.3	Residential	MFB B-173	151,155-162
S-212	10/2/01	10/3/01	11/9/01	11/19/01	11/26/01	232.1	35,363.4	Residential	MFB PPA	Na
M-213	10/3/01	10/4/01	10/22/01	10/30/01	11/3/01	232.1	35,595.5	Residential	MFB B-173	155-162
N-214	10/8/01	10/9/01	11/1/01	11/9/01	11/13/01	232.1	35,827.6	Residential	MFB PPA	Na
M-215	10/9/01	10/10/01	11/2/01	11/12/01	11/14/01	232.1	36,059.7	Residential	MFB PPA	Na
N-216	12/3/01	12/3/01	12/20/01	1/3/02	1/4/02	232.1	36,291.8	Residential	MFB PPA	Na

* = Resampled windrow, previously reported

PPA = Permanent Placement Area

Na = not applicable

PR = Previously Reported

TABLE 3				
AVERAGE EXPLOSIVE COMPOUNDS DAY LAST ANALYTICAL DATA (ppm)				
WINDROW #	DAY #	HMX	RDX	TNT
S-212	37	0.5	0.6	0.5
M-213	18	1.3	1.5	0.5
N-214	23	1.3	1.1	0.5
M-215	23	1.3	1.6	0.5
N-216	17	0.3	0.5	0.5
CLEANUP GOALS	Residential	3,300	4	15
	Industrial	34,000	17	64

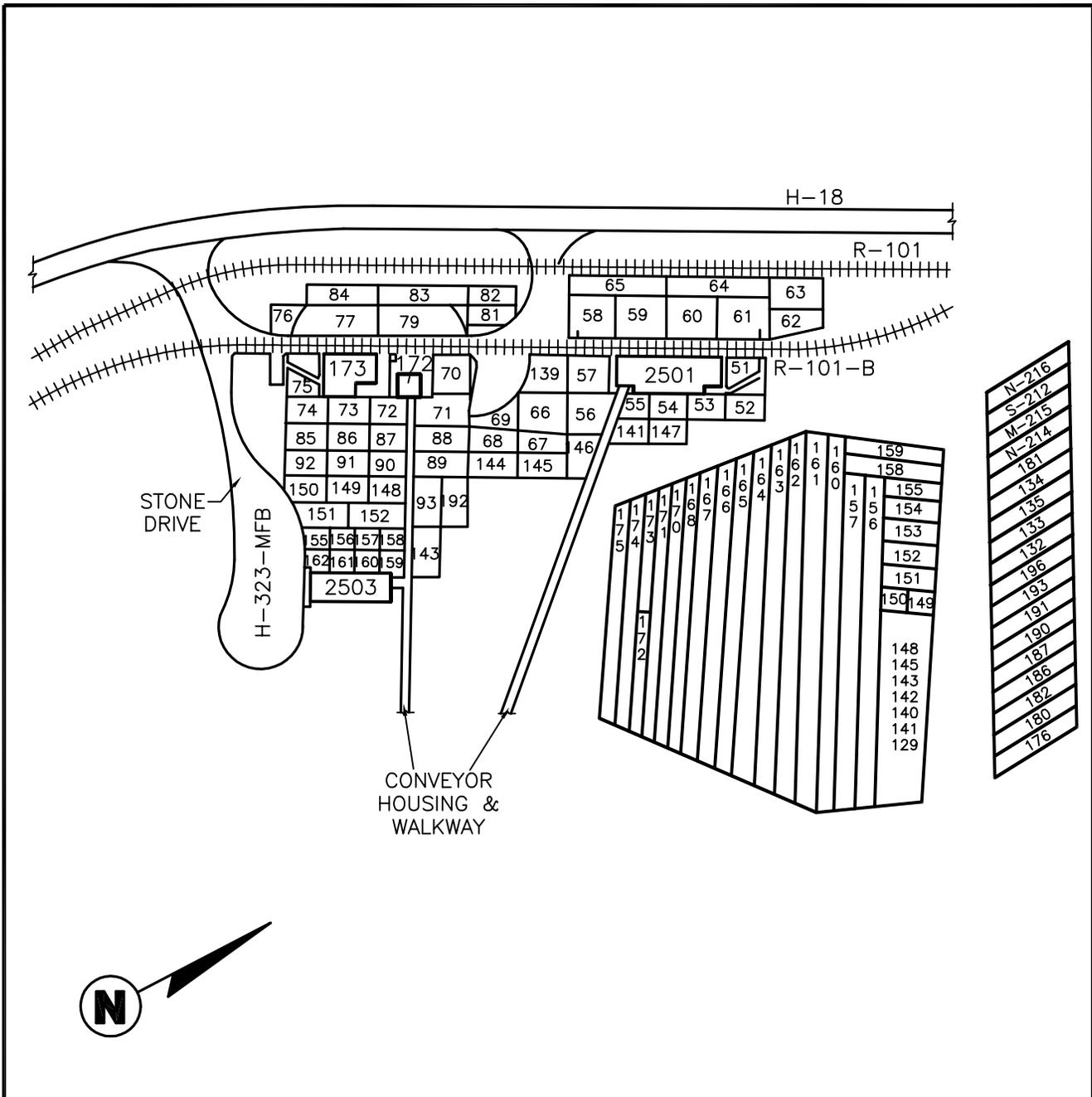
TABLE 4		
AVERAGE DAY LAST EXPLOSIVE COMPOUNDS LEVELS (ppm)		
HMX	RDX	TNT
0.9	1.1	0.5

Table 5 Retention Pond Water Analytical Results

Sample Date	11/29/01	11/29/01	12/17/01	12/17/01	Discharge Limits	
Pond #	1	2	1	2		
Sample ID	RPW-086	RPW-087	RPW-088	RPW-089	Surface	Sewer
HMX	0.0003J	ND	0.0004J	0.0005J	BDL	2.0 total of 3
RDX	0.00173	0.00112	0.00161	0.0007J	BDL	
TNT	ND	ND	ND	ND	BDL	
Ammonia (5/1-11/30)	na	na	na	na	3	69.8
Ammonia (12/1-4/30)	ND	9.1	ND	3.9	6	139.6
CBOD	*	*	9.9	4.9	15	75
BOD	18.8	44.7	Not applicable		Not applicable	
COD	47.3	136				
TSS	10	37	5	9	15	500
Nitrate	ND	0.2	0.58	ND	No standard	90
O&G	2.1	3.1	ND	ND	No sheen	15
Cadmium	ND	ND	ND	ND	0.003	0.0321
Chromium	ND	0.0032	0.0008	0.0017	0.59	8.59
Copper	ND	0.0176	0.0015	0.004	0.02	0.201
Lead	ND	ND	ND	0.002	0.012	0.151
Mercury	0.00013	0.00014	ND	ND	0.0001	0.0011
Nickel	0.0009	0.0069	0.0013	0.0026	0.164	2.34
Silver	ND	ND	ND	0.0012	0.01	0.134
Zinc	0.0155	0.2	0.0142	0.0447	0.308	4.26
Cyanide	ND	ND	ND	ND	0.009	0.109

* = The contract lab did not have the capability to perform CBOD until December 2001.
J =an estimated value, the data indicates the presence of the compound that is less than the quantitation limit but greater than zero.
All results in mg/kg

FIGURES:



MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

LEGEND

- (R) - RESIDENTIAL
- (I) - INDUSTRIAL

100101-123101 QUARTERLY REPORT

FIGURE 1
MFB GRID AND WINDROW LOCATION MAP
BACKFILL OPERATIONS
MINE FILL B - PERMANENT PLACEMENT AREA
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR
NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN MRC/3-2-01

DRAWING NO.: 37324-01 Q4

REVISED RJO/1-14-02

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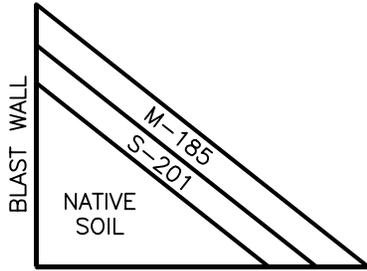
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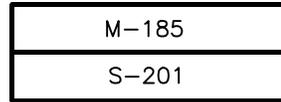
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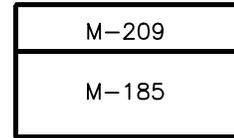




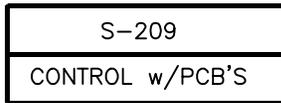
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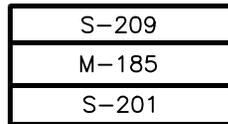
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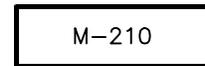
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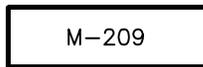
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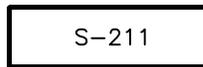
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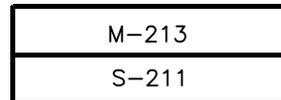
GRID 90, 148 AND 152



GRID 91, 92 AND 150



GRID 151



GRID 155-162

MEASUREMENTS ARE APPROXIMATE
NOT TO SCALE

FIGURE 1
MFB GRID AND WINDROW LOCATION MAP
BACKFILL OPERATIONS
MINE FILL B - PERMANENT PLACEMENT AREA
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

PREPARED FOR
NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, IN

DRAWN RJO/1-14-02

DRAWING NO.: 37324-06 Q4

REVISED

CHKD:

APPR:

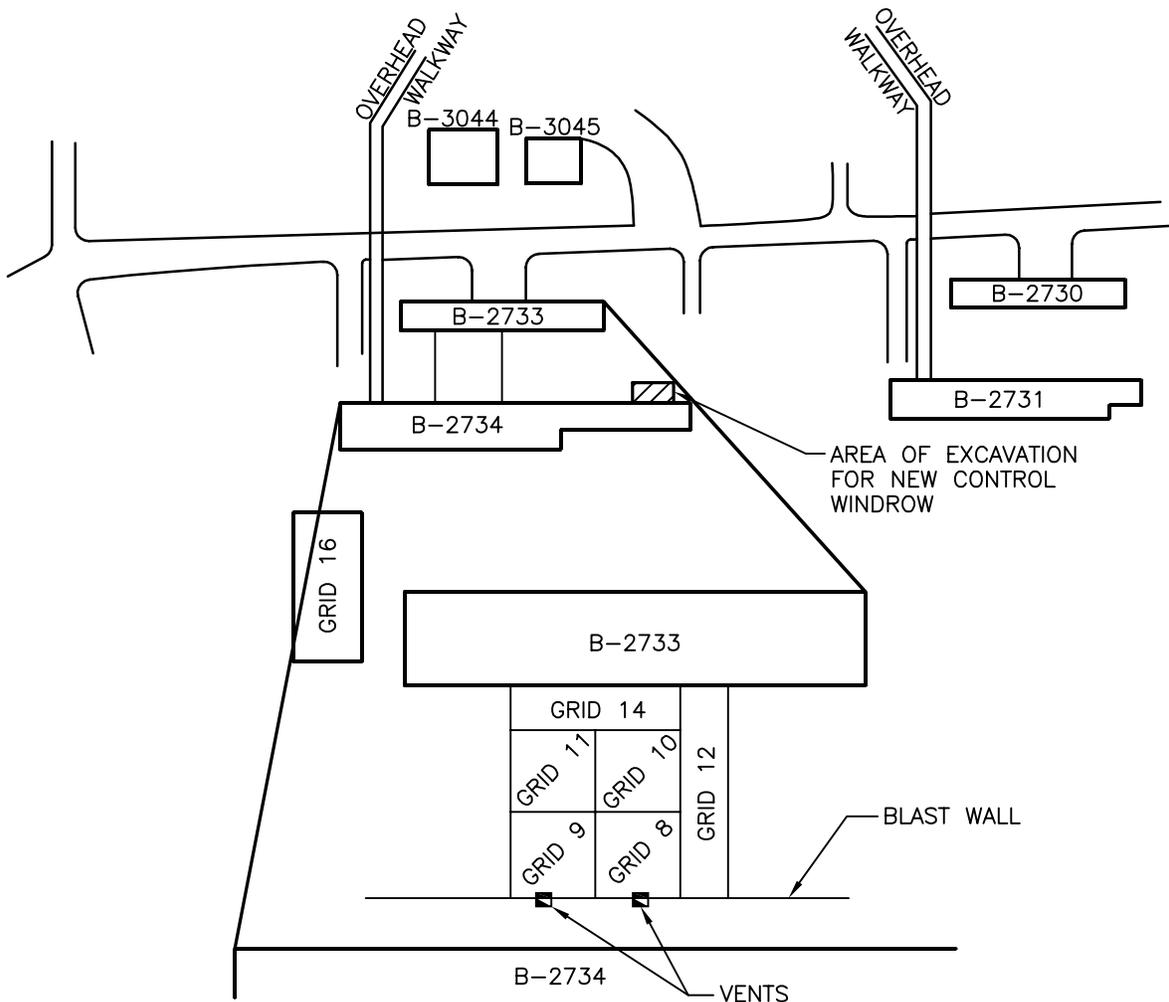
JOB NO.: 37324.01

SHEET NUMBER

2 of 2

TOWEST, INC.

100101-123101 QUARTERLY REPORT



NOT TO SCALE

100101-123101 QUARTERLY REPORT

**FIGURE 2
ROCKEYE GRID AND WINDROW
LOCATION MAP**

PAGE 1
NSWC CRANE, INDIANA

PREPARED FOR
**NAVAL FACILITIES ENGINEERING COMMAND
NSWC CRANE, INDIANA**

DRAWN MRC/10-22-01

DRAWING NO.: 37324-03 Q4

REVISED RJO/1-14-02

CHKD:

APPR:

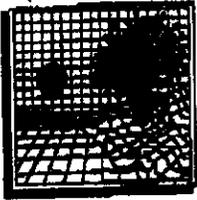
JOB NO. 37324.01

SHEET NUMBER

1 of 1



APPENDIX A
Retention Pond Water Analytical Data Sheets



SOUTHWEST LABORATORY OF OKLAHOMA, INC.
 1700 West Albany Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599
LABORATORY RESULTS

LAB ID : 48178.01
 SAMPLE : RPW-086
 SDG : 48178
 MATRIX : W

REPORTED : 12/06/01
 SAMPLED : 11/29/01
 SUBMITTED: 11/30/01

PARAMETER	REPORTING LIMIT**	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	1.0	mg/l	ND	12-04-01 09:40	SB	EPA 350.2
BIOCHEMICAL OXYGEN DEMAND	10	mg/l	18.8	11-30-01 13:18	KAL	SM 5210B/EPA 405.1
CHEMICAL OXYGEN DEMAND	10	mg/l	47.3	11-30-01 09:18	SB	EPA 410.1/EPA 410.2
OIL AND GREASE	2.0	mg/l	2.1	12-05-01 14:00	SB	EPA 1664
TOTAL SUSPENDED SOLIDS	4.0	mg/l	10	12-03-01 09:15	SB	SM 2540D/EPA 160.2
NITRATE	0.10	mg/l	ND	11-30-01 12:52	DT	EPA 300
NITRITE	0.10	mg/l	ND	11-30-01 12:52	DT	EPA 300

COMPOUND* = RESULTS REPORTED AS RECEIVED

ND = NOT DETECTED ABOVE QUANTITATION LIMIT

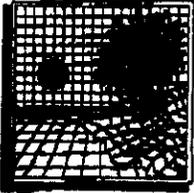
* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

N/A = NOT APPLICABLE

METHODOLOGY: SM = STANDARD METHODS, 19TH EDITION, 1995

EPA = #EPA600/4-79-020, MARCH 1985

SW = SW 846 Rev. 4 1996



SOUTHWEST LABORATORY OF OKLAHOMA, INC.

1700 West Albany Broken Arrow, Oklahoma 74012 Office (918) 251-2858 Fax (918) 251-2599

LABORATORY RESULTS

LAB ID : 48178.02
 SAMPLE : RPW-087
 SDG : 48178
 MATRIX : W

REPORTED : 12/06/01
 SAMPLED : 11/29/01
 SUBMITTED: 11/30/01

PARAMETER	REPORTING LIMIT**	UNITS	RESULTS	DATE/TIME ANALYZED	ANALYST	METHOD REFERENCE
AMMONIA (N)	1.0	mg/l	9.1	12-04-01 09:40	SB	EPA 350.2
BIOCHEMICAL OXYGEN DEMAND	20.0	mg/l	44.7	11-30-01 13:18	KAL	SM 5210B/EPA 405.1
CHEMICAL OXYGEN DEMAND	10	mg/l	136	11-30-01 09:18	SB	EPA 410.1/EPA 410.2
OIL AND GREASE	2.0	mg/l	3.1	12-05-01 14:00	SB	EPA 1664
TOTAL SUSPENDED SOLIDS	4.0	mg/l	37.0	12-03-01 09:15	SB	SM 2540D/EPA 160.2
NITRATE	0.10	mg/l	0.20	11-30-01 13:08	DT	EPA 300
NITRITE	0.10	mg/l	ND	11-30-01 13:08	DT	EPA 300

COMPOUND* - RESULTS REPORTED AS RECEIVED

ND = NOT DETECTED ABOVE QUANTITATION LIMIT

* = SURROGATE RECOVERY OUTSIDE OF QC LIMITS

N/A = NOT APPLICABLE

METHODOLOGY: SM = STANDARD METHODS, 19TH EDITION, 1995

EPA = #EPA600/4-79-020, MARCH 1983

SW = SW 846 Rev. 4 1996

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

RPW-086

Lab Name: SWL-TULSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 48178

Matrix: (soil/water) WATER Lab Sample ID: 48178.01

Sample Amt: 770 ML % Moisture: _____ Date Received: 11/30/01

Extraction Volume: 10 ML Date Extracted: 12/01/01

Extraction Method: SNAKER Date Analyzed: 12/05/01

GPC Cleanup: (Y/N) N Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION	UNITS: UG/L	Q
2691-41-0	BMX	0.298		PJ
121-82-4	RDX	1.73		
99-35-4	TNB	0.650		U
99-65-0	DNB	0.650		U
479-45-8	TETRYL	0.650		U
98-95-3	NB	0.650		U
118-96-7	TNT	0.650		U
1946-51-0	4ADNT	0.650		U
35572-78-2	2ADNT	0.650		U
606-20-2	26DNT	0.650		U
121-14-2	24DNT	0.650		U
88-72-2	2NT	0.650		U
99-99-0	4NT	0.650		U
99-08-1	3NT	0.650		U
	3,4-DNT surrogate spiked	10.39		

1D
EXPLOSIVES ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

RPW-087

Lab Name: SWL-TOLSA

Lab Code: SWOK Case No.: TOLTEST SDG No.: 48178

Matrix: (soil/water) WATER Lab Sample ID: 48178.02

Sample Amt: 770 ML % Moisture: _____ Date Received: 11/30/01

Extraction Volume: 10 ML Date Extracted: 12/01/01

Extraction Method: SHAKER Date Analyzed: 12/05/01

GPC Cleanup: (Y/N) N Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION	UNITS: UG/L	Q
2691-41-0	HMX	0.650		U
121-82-4	BDK	1.12		U
99-35-4	TNB	0.650		U
99-65-0	DNB	0.650		U
479-45-8	TETRYL	0.650		U
98-95-3	NB	0.650		U
118-96-7	TNT	0.650		U
1946-51-0	4ADNT	0.650		U
35572-78-2	2ADNT	0.650		U
606-20-2	26DNT	0.650		U
121-14-2	24DNT	0.650		U
88-72-2	2NT	0.650		U
99-99-0	4NT	0.650		U
99-08-1	3NT	0.650		U
3,4-DNT surrogate spiked		10.39		

Southwest Laboratory of Oklahoma, Inc.
 Laboratory Results Summary Report
 By Sample Point

Date: 12/31/2001
 Page: 1

Client: TOLTEST, INC.

Project: NSWC CRANE

Sample Point->	RPW-088	RPW-089				
Sample Date->	12/17/2001	12/17/2001				
LAB#->	48352.01	48352.02				
Matrix: WATER						
Parameters	Units					
EXPLOSIVES ANALYSIS						
PMX	UG/L	0.415 PD	0.460 J			
SDX	UG/L	1.61	0.646 J			
TKB	UG/L	0.650 U	0.650 U			
DNB	UG/L	0.650 U	0.650 U			
TETRYL	UG/L	0.650 U	0.650 U			
NB	UG/L	0.650 U	0.650 U			
INT	UG/L	0.650 U	0.650 U			
4ADNT	UG/L	0.650 U	0.650 U			
2ADNT	UG/L	0.650 U	0.650 U			
24DNT	UG/L	0.650 U	0.650 U			
24DNT	UG/L	0.650 U	0.650 U			
2NT	UG/L	0.650 U	0.650 U			
4NT	UG/L	0.650 U	0.650 U			
3NT	UG/L	0.650 U	0.650 U			
MISCELLANEOUS						
AMMONIA (N)	mg/l	1.0 U	3.9			
CARB. BOD	mg/l	9.9	4.9			
CHEMICAL OXYGEN DEMAND	mg/l	25.1	33.7			
NITRATE	mg/l	0.58	0.10 U			
NITRITE	mg/l	0.10 U	0.10 U			
OIL AND GREASE	mg/l	2.0 U	2.0 U			
TOTAL SUSPENDED SOLIDS	mg/l	5.0	9.0			
Metals Parameters						
ALUMINUM	ug/l	73.0 B	208			
CALCIUM	ug/l	0.30 U	0.30 U			
CHROMIUM	ug/l	0.81 B	1.7 B			
COPPER	ug/l	1.5 B	4.0 B			
CYANIDE	ug/l	1.0 U	1.0 U			
LEAD	ug/l	1.6 U	2.0 B			
MERCURY	ug/l	0.10 U	0.10 U			
NICKEL	ug/l	1.3 B	2.6 B			
SILVER	ug/l	0.70 U	1.2 B			

U: ANALYZED BUT NOT DETECTED
 See enclosure for additional qualifiers
 LAM1.0NNYYNRM

01-08-2002 04:17PM FROM: TolTest, Inc. T-888 P. 002/003 F-882

Southwest Laboratory of Oklahoma, Inc.
 Laboratory Results Summary Report
 By Sample Point

Date: 12/31/2001
 Page: 2

Client: TOLTEST, INC.

Project: NSWC CRANE

Matrix: WATER	Sample Point-> Sample Date-> LAB#->	RPW-088 12/17/2001 48352.01	RPW-089 12/17/2001 48352.02				
Parameters ZINC	Units ug/l	14.2 B	44.7				

U: ANALYZED BUT NOT DETECTED
 See enclosure for additional qualifiers
 LMM1.0NNYYMMN

01-08-2002 04:17PM FROM-TolTest, Inc.

T-888 P.003/003 F-882

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

SIGNATURE

James M. Hunsicker

DIRECTOR, ENVIRONMENTAL PROTECTION DEPARTMENT
BY DIRECTION OF THE COMMANDER

TITLE

1/28/02
DATE