



DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

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NSWC CRANE
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IN REPLY REFER TO:

5090
Ser 095/2018

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Illinois, Indiana, and Michigan 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 the Quality Assurance Project Plan (QAPP) addendum for soil sampling and risk screening at Solid Waste Management Unit (SWMU) 30/00 (Landfarm). This QAPP addendum is in response to U.S. Environmental Protection Agency comments on the Draft Phase II Ground Water RCRA Facility Investigation for SWMU 30. Two copies are provided as enclosure (1). The permit required Certification Statement is provided as enclosure (2).

NSWC Crane point of contact is Mr. Thomas J. Brent, Code 09510, telephone 812-854-6160.

Sincerely,

James M. Hunsicker
Director, Environmental
Protection Department
By direction of the Commander

Encl:

- (1) SWMU 30 QAPP Addendum for Soil Sampling
- (2) Certification Statement

Copy to:

ADMINISTRATIVE RECORD
SOUTHNAVFACENCOM (Code ES32) (w/o encl)
IDEM (Doug Griffin)
TTNUS (Ralph Basinski) (w/o encl)

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.

Jama Hurvick
SIGNATURE

Environmental Protection Department Manager
TITLE

1/07/02
DATE

**Phase II Ground Water RCRA Facility Investigation
Solid Waste Management Unit 30 (LANDFARM)
Quality Assurance Project Plan Addendum for Soil/Sludge Sampling and Risk Screening**

Five rounds of groundwater data were collected at the Landfarm between October 1999 and October 2000. Results of these data have shown that no statistically significant impacts to groundwater have occurred from this SWMU.

Based on the results of groundwater data, Tetra Tech NUS (TtNUS) prepared the Draft Phase II RCRA Facility Investigation Report for Solid Waste Management Unit (SWMU) #30 (Landfarm) dated May 2001. The Navy requested no further action at this SWMU for all media. The U.S. EPA responded to this request on October 30, 2001, recommending that the Navy proceed with drafting a risk screening document for this SWMU as part of an official no further action request (as was done for previous NSWC Crane SWMUs such as the Lithium Battery Site). As requested by the U.S. EPA, this risk screening should be conducted using the Technical Guidance on Corrective Action Activity, Naval Surface Warfare Center Crane, Indiana dated August 1999. The U.S. EPA also recommended that the Navy collect and analyze soil/sludge samples from the Landfarm in order to identify any potential risks that may be present in the soil/sludge exposure pathway. They further suggested that samples should be collected from the surface soil (0 to 1 foot); tested for total metals; and these results compared to the Basewide Background Soil Investigation levels and risk-based screening levels for soils (human health and ecological). They further added that this would determine what, if any, institutional and/or engineering controls might be necessary for the SWMU should soil/sludge sampling show elevated levels of constituents.

A conference call was conducted on November 8, 2001 to discuss the proposed additional activities for the Landfarm. The following persons were present during the conference call:

Bill Gates (Remedial Project Manager-SOUTHDIV)
Christine Freeman (NSWC Crane)
Peter Ramanauskas (Project Manager-U.S. EPA Region 5)
Roger Clark (Task Order Manager- TtNUS)
LeeAnn Sinagoga (Department Manager Risk Assessment-TtNUS)
Mark Francis (Deputy Task Order Manager- TtNUS)

The following summarizes EPA's recommendations from this conference call:

- No additional risk screening is required for groundwater.
- Prepare a streamlined soil sampling Work Plan Addendum referencing previously approved NSWC Crane QAPPs.
- List the types, number, locations and depths of samples to be collected.
- If possible, make visual distinction between sludge and soil in the field.
- Analyze only for metals (F006) and any other metals related to F006 including cyanide.
- Recommended sampling depths of surface (0 to 1-foot bgs) and shallow subsurface (1 to 4 feet bgs).
- Incorporate grid and/or random sampling methods.
- Compare results to Risk Based Screening Levels and Background Values.
- Use both industrial and residential values for comparison.
- May want to perform intermediate risk assessment, which would fall between a quantitative and a qualitative screening.
- The assessment will need to also address ecological factors.

Based on the above-listed recommendations, the following activities are proposed to address these comments.

SAMPLING RATIONALE

This section describes the sampling rationale to be incorporated for the soil/sludge sampling at the Landfarm. In an attempt to expedite the fieldwork at this SWMU, similar field collection and analysis procedures that were recently conducted at an adjacent SWMU will be incorporated where possible. Fieldwork at an adjacent SWMU was recently conducted at the Old Rifle Range (SWMU 7) that is also located at NSWC Crane. The field activities at the Old Rifle Range (ORR) consist of collection and analysis of surface and shallow subsurface soil samples. This work is being conducted under a recently U.S. EPA-approved Quality Assurance Project Plan (QAPP) dated October 2000. Where possible, field procedures including sampling methodologies referenced in the ORR QAPP will be used in the current Work Plan Addendum for the Landfarm.

SOIL SAMPLING LOCATIONS, ANALYSES, AND RATIONALE

This section presents sampling locations, QA samples to be collected, analyses to be performed, and rationale for the sampling and analytical program. Details regarding the equipment and procedures for collecting, preserving, packaging, and shipping the samples are included in Section 4.0 and related SOPs in Appendix B of the QAPP for the ORR at Crane (TtNUS, October 2000).

Wastewater treatment plant sludges were applied at SWMU 30 (Landfarm) from November 1988 through March 1995. Although laboratory analyses were performed on these sludges, the only available data are from January 1990 through July 1992 (refer to Tables 1-1A & 1-1B of the Landfarm Work Plan, TtNUS, August 1999). The primary constituents of concern are several metals such as those cited as the reason that some wastewater treatment plant sludges from electroplating operations are an F006 listed hazardous waste (e.g., cadmium, chromium, and nickel). (These metals have been detected in sludge samples [1990, 1991] for SWMU 30.) Based on existing site information, wastewater treatment plant sludges were not preferentially applied to any particular sub-area of SWMU 30. The following surface and subsurface soil sampling activities are intended to determine whether significant quantities of waste materials (metals) have accumulated in the soils as a result of the sludge application.

Soil sampling locations at SWMU 30 will be selected as follows. SWMU 30 will be divided into 12 sub-areas as shown on the attached figure (each sub-area will represent approximately 9,000 square feet). Each sub-area will be divided further into a 10-by-10 array of subcells (i.e., 100 sub-cells approximately 90 square feet each). Five subcells within each sub-area will be selected as borehole sampling locations (the borehole will be advanced at the approximate center point of the sub-cell). Sub-cells to be sampled will be randomly selected using a uniform random number generator (Microsoft Excel 97 SR-2 [h]). This soil sampling design constitutes a stratified random design (as was used in the evaluation of SWMU 1/12 [Mustard Gas Burial Ground] during a recent NSWC Crane investigation). Samples collected from each of the five subcells in each sub-area will be composited and the composite soil sample will be analyzed as described below. Samples will be collected at the three depth-intervals described below. Thus, three composite soil samples will be submitted to the laboratory from each sub-area (i.e., a total of 36 composite soil samples [i.e., 12 sub-areas; 3 composite samples from each sub-area] will be submitted for analysis). Additionally, no more than 6 borings (18 samples) will be advanced just outside the assumed limits of SWMU 30 to confirm the lateral extent of the SWMU and to further investigate potential contaminant migration from the SWMU.

Because of the shallow depths and unconsolidated nature of the samples to be collected, subsurface soil sampling may be performed using a hand auger or DPT, depending on site conditions. Based on historical accounts of the sludge application activities, the sludges were highly liquid and were poured directly onto the ground surface. At the request of the U.S. EPA, an attempt will be made during sampling to differentiate between sludge and native soil, although

it is assumed that an obvious visual distinction between the two will not be feasible. Excess soil cuttings from the borings will be placed back in the borehole. Details regarding soil sampling equipment and procedures are included in the previously approved Work Plan for the Landfarm.

Three soil samples will be collected from each borehole location from the following nominal depth intervals: 0 to 6 inches, 6 inches to 2 feet bgs, and 2 feet to 4 feet bgs. Bedrock is not anticipated to occur at shallow depths underlying the Landfarm, although if bedrock is shallower than the bottom of a depth interval, sampling will stop at the bedrock. Surface soils will be defined as soils 0 to 2 feet bgs, and subsurface soils will be defined as soils greater than 2 feet bgs. Soil samples will be collected even if the borehole advances into a saturated zone. The top of the water table underlying the Landfarm averages over 25 feet bgs and saturated conditions are not anticipated. Although subsurface soils will be collected (2 to 4 feet bgs); contamination is most likely to be present in the surface soils (versus subsurface soils) given the fact that the sludges were applied to the surface soils. Initially, samples from the 0 to 6 inch soil interval and the 2 to 4 foot bgs soil interval only will be analyzed for target analytes. The soil sample from the 6 inch to 2 foot bgs interval will be analyzed if chemical concentrations in the 0 to 6 inch depth interval exceeds the following screening levels (and background):

- U.S. EPA Region 9 Preliminary Remediation Goals for exposure to soils (residential land use)
- IDEM - Tier I Default Closure Levels for soils for Residential Land Use
- U.S. EPA Soil Screening Levels for Soil Ingestion, Transfer from Soils to Air, and Migration from Soils to Groundwater
- U.S. EPA Region 5 Ecological Data Quality Levels

A maximum of 54 samples (i.e., 36 sub-area samples and 18 boundary samples) will be collected and analyzed. Additional soil samples may be collected and analyzed in a Phase 2 investigation if:

- The statistical analysis of the Phase 1 data indicates that exposure point concentrations based on the Phase 1 data are highly uncertain (e.g., the variability in chemical concentrations noted in the Phase I samples indicate an inadequate number of samples have been collected), and/or
- The vertical or horizontal extent of contamination has not been bounded AND the risk assessment of target analyte concentrations in the Phase I soil samples exceed risk benchmarks acceptable to the Navy and the U.S. EPA.

All of the soil samples will be analyzed for target analyte list metals and cyanide, hexavalent chromium and pH. Analytical methods have been specified on the attached table and are generally those specified for other SWMUs currently under investigation for the Crane NSWC (e.g., SWMU1/12).

QA/QC samples will be collected. Duplicate samples and rinsate blanks will be collected at a rate of 1 for every 10 regular soil samples and analyzed for the same analytes as the corresponding soil samples. Matrix spike and matrix spike duplicates will be collected and analyzed in the fixed laboratory at a rate of 1 per every 20 soil samples.

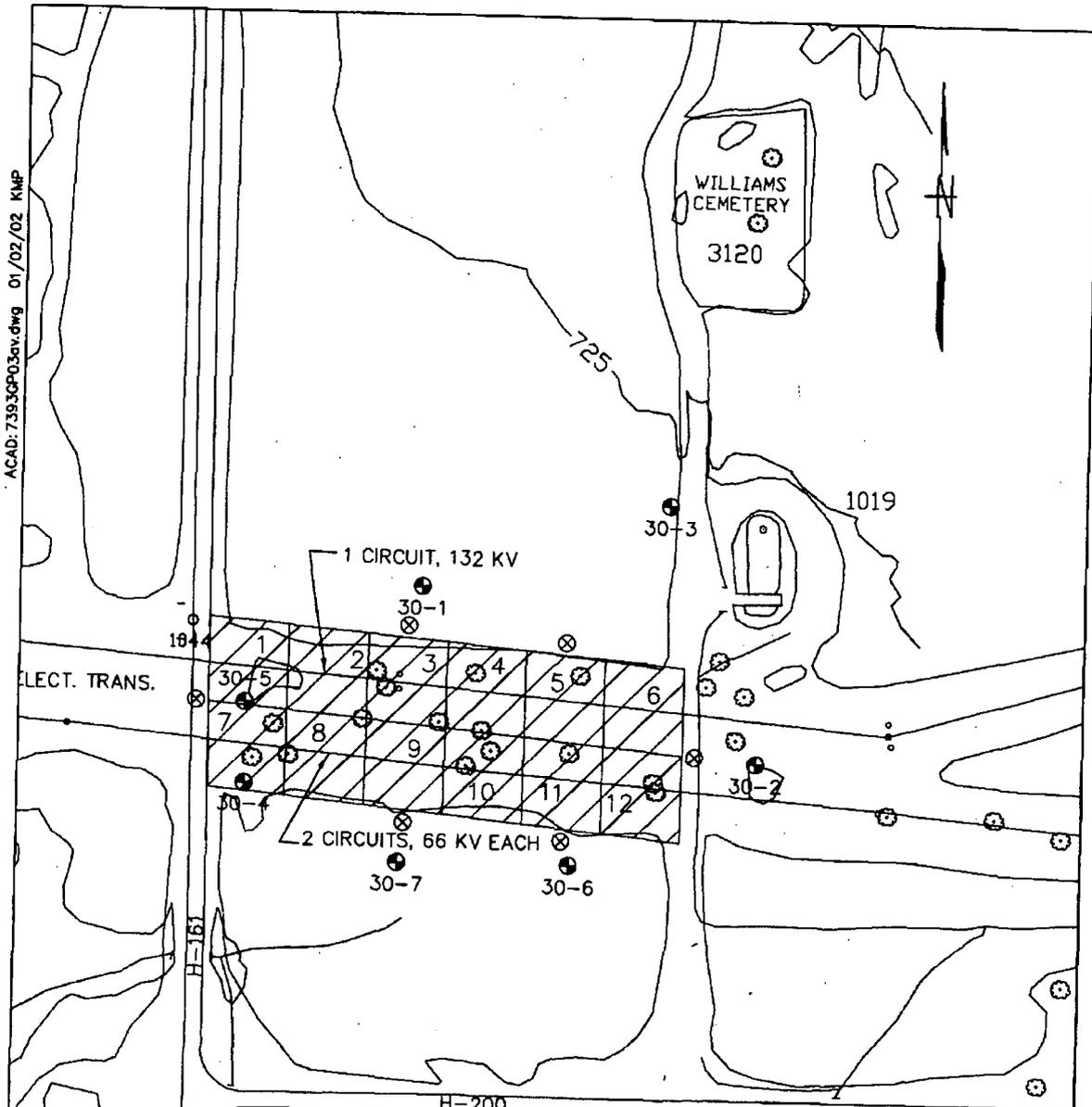
TABLE 1-1

SUMMARY OF ANALYTICAL PROCEDURES
 SOLID SAMPLES
 NSWC CRANE, CRANE, INDIANA
 PAGE 1 OF 1

Analytical Parameter	Preparation Method	Analytical Method	Preparation/Analytical SOP(s) ⁽¹⁾
Metals (As, Ba, Be, Cd, Cr [total], Co, Cu, Pb, Ni, Se, Ag, Tl, V, Zn)	SW-846 Method 3050B (no HCl)	SW-846 Method 6020	LTL-7012 or LTL-7015/ LTL-7202
Sb	SW-846 Method 3050B (no H ₂ O ₂)	SW-846 Method 6020	LTL-7012 or LTL-7015/ LTL-7202
Metals (Al, Ca, Fe, Mg, Mn, K, Na)	SW-846 Method 3050B	SW-846 Method 6010B	LTL-7012 or LTL-7015/ LTL-7105
Mercury	SW-846 Method 78471A	SW-846 Method 7471A	LTL-7501
Hexavalent chromium	SW-3060A	SW-846 7196A	LTL7014/LTL-7401
pH	No prep method required	SW-846 9045C	LTL-9113

1 Laboratory SOPs are available upon request.

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LEGEND

- ⊗ APPROXIMATE BOUNDARY AREA
- SAMPLE LOCATION
- ⊙ MONITORING WELL
- ▨ APPROX. LANDFARM LOCATION

0 200 400
SCALE IN FEET

DRAWN BY	DATE
KMP	12/24/01
CHECKED BY	DATE
COST/SCHED-AREA	
SCALE	
AS NOTED	



SUB-AREAS (1-12) FOR SOIL SAMPLING
SWMU 30
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA

CONTRACT NO. 7393	
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO. FIGURE	REV. 0

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Ser 095/2018

07 JAN 2002

The letter Ser 095/2018 was for the submittal of the QAPP Addendum for Soil Sampling and Risk Assessment to the RFI Phase II Landfarm Ground Water Workplan. This submittal was revised on 02/11/02 and revised again on 02/28/02. The replacement pages have been incorporated into the previously submitted Workplan on 05/12/99.