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FINAL REMEDIAL ACTION/CORRECTIVE ACTION WORK PLAN SITE 8 NCBC GULFPORT
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ENVIRONMENTAL CHEMICAL CORPORATION



**FINAL
REMEDIAL ACTION/CORRECTIVE ACTION
WORK PLAN**

**Site 8 – Herbicide Orange Storage Area and
Off-Base Area of Contamination**

**Naval Construction Battalion Center
Gulfport, Mississippi**

October 2004

Prepared for:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29406

Prepared under:
Contract Number N62467-02-D-0468
Contract Task Order 002

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WORK PLAN**

FOR

SITE 8 – HERBICIDE ORANGE STORAGE AREA

AND

OFF-BASE AREA OF CONTAMINATION

**Naval Construction Battalion Center
Gulfport, Mississippi**

Submitted to:

**Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29406**

Submitted by:

**Environmental Chemical Corporation
1040 Bayshore Highway
Burlingame, CA 94010**

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PREPARED UNDER THE SUPERVISION OF:

APPROVED FOR SUBMITTAL BY:

Prashant Khanna
Project Manager
Environmental Chemical Corporation

Robert W. Anderson
Quality Control Manager
Environmental Chemical Corporation

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LIST OF ACRONYMS AND ABBREVIATIONS

AHA	Activity Hazard Analyses
AOC	Area of Concern
BSTS	Bench Scale Treatability Study
CAS	Columbia Analytical Services, Inc
CBR	California Bearing Ratio
CERCLA	Comprehensive Environmental Response and Compensation Liability Act
COC	Contaminant of concern
CRZ	Contamination Reduction Zone
DFW	Definable Features of Work
DMR	Mississippi Department of Marine Resources
DQCR	Daily Quality Control Report
ECC	Environmental Chemical Corporation
EISOPAQM	Environmental Investigation Standard Operating Procedures and Quality Manual
EPA	United States Environmental Protection Agency
EZ	Exclusion Zone
FFS	Focused Feasibility Study
FSP	Field Sampling Plan
HLA	Harding Lawson Associates
HO	Herbicide Orange
IR	Installation Restoration
LUCAP	Land-Use Control Assurance Plan
LUCIP	Land-Use Control Implementation Plan
µg/kg	micrograms per kilogram
MDEQ	Mississippi Department of Environmental Quality
Navy	United States Navy
NAVFAC	Naval Facilities Engineering Command
NCBC	Naval Construction Battalion Center
ng/kg	nanograms per kilogram
NOI	Notice of Intent
OPC	MDEQ Office of Pollution Control
OSHA	Occupational Safety and Health Administration
PDI	Pre-design Investigations
PM	Project Manager
PPE	Personal Protective Equipment
PRM	Program Manager
psi	pounds per square inch
QAPP	Quality Assurance Project Plan
QC	Quality Control
QCM	Quality Control Manager
RA	Remedial Action
RA/CA	Remedial Action/Corrective Action
RAOs	Remedial Action Objectives
RCC	Roller-Compacted Concrete
RD	Remedial Design

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

100% RD	100% Remedial Design
RLS	Registered Land Surveyor
ROICC	Resident Officer in Charge of Construction
SAP	Sampling and Analysis Plan
SARA	Superfund Amendments and Reauthorization Act of 1986
SHSP	Site Health and Safety Plan
SOPs	Standard Operating Procedures
SOUTHDIV	Southern Division
SPLP	Synthetic Precipitation Leaching Procedure
SRT	Sediment Recovery Trap
SS	Site Superintendent
SSHO	Site Safety and Health Officer
SWPPP	Storm Water Pollution Prevention Plan
SZ	Support Zone
TCDD	2, 3, 7, 8-tetrachlorodibenzo-p-dioxin
TEQ	Total Toxicity Equivalents
TRG	Target Remediation Goal
TtNUS	Tetra Tech NUS, Incorporated
UCS	Unconfined Compressive Strength
USACE	U.S. Army Corps of Engineers
USAF	United States Air Force
WP	Work Plan
yd³	cubic yards

1.0 INTRODUCTION AND PROJECT BACKGROUND

This document presents the Final Remedial Action/Corrective Action (RA/CA) Work Plan for Site 8, Herbicide Orange (HO) Storage Area and Off-Base Area of Contamination at the Naval Construction Battalion Center (NCBC), Gulfport, Mississippi (Figure 1-1). This RA/CA Work Plan was prepared by Environmental Chemical Corporation (ECC) on behalf of the United States Navy (Navy) Southern Division (SOUTHDIV) Naval Facilities Engineering Command (NAVFAC). This Final RA/CA Work Plan was prepared in accordance with the United States Environmental Protection Agency (EPA) “Remedial Design/Remedial Action Handbook”. Comments made by the Navy and state/federal regulators on the Draft RA/CA Work Plan were incorporated into this Final RA/CA Work Plan and will be incorporated into subsequent RA/CA Report submittals.

The information presented in this section was obtained from previous Site 8 reports prepared for the Navy and approved by EPA and the Mississippi Department of Environmental Quality (MDEQ). The primary sources of this information are the 100% Remedial Design, Site 8 – Herbicide Orange Storage Area and Off-Base Area of Contamination (100% RD) (TtNUS, 2004) and Focused Feasibility Study (TtNUS, 2003a) reports.

NCBC Gulfport is located in the southeastern corner of Mississippi, approximately two miles north of the Gulf of Mexico. The base is located in the western part of the city of Gulfport in Harrison County (Figure 1-1). The off-base Area of Concern (AOC) is located north of NCBC, across 28th Street near Outfall 3. The base occupies 1,100 acres with an average elevation of approximately 30 feet above sea level, the only significant exceptions being two rectangular piles of bauxite (aluminum ore) stored on the surface that are approximately 45 feet higher than the adjacent ground. A site layout map of NCBC Gulfport is provided as Figure 1-2.

Site 8 consists of three contiguous storage areas (Areas A, B, and C) (hereinafter referred to as Site 8A, Site 8B, and Site 8C) located in the north-central portion of NCBC Gulfport (Figure 1-2). The main former HO drum storage area, Site 8A, which encompasses approximately 13 acres, has an undulating surface due to previous remedial activities and is covered with light vegetation. The surface soil in non-stabilized areas is typically a fine- to medium-grained sand. Approximately one-third of Site 8A consists of stabilized areas where HO drums were stored. Site 8A includes the upper reaches of the drainage areas for the eastern two-thirds of the base. Surface drainage from Site 8A flows to the northwest, exiting the base at Outfall 3 into a drainage system that feeds Canal No. 1, which flows north to Turkey Creek (TtNUS, 2003a). Prior to 1995, the surface water that exited the base via Outfall 3 discharged to wetlands (the off-base AOC) that are a part of the Turkey Creek drainage basin (HLA, 2000).

Sites 8B and 8C encompass approximately 18 acres, are relatively flat, and have almost no vegetation. Sites 8B and 8C were also used for storage of drums containing HO. The Site 8B and 8C surface soils consist of fine- to medium-grained sand and approximately one-third of these areas are stabilized with Portland cement. Sites 8B and 8C are also located at

the head of local drainage basins. Surface water from Site 8B flows north and exits the base at Outfall 4, discharging to the Turkey Creek drainage basin. Surface water from Site 8C drains to the southeast, exiting the base at Outfall 2 into Brickyard Creek (TtNUS, 2003a).

1.1 Site History and Contaminants

Prior to 1968, Site 8 was used as an equipment storage and staging area. Around 1961, the surface soils were stabilized with Portland cement to provide a hardened surface for heavy equipment operation and storage. Between 1968 and 1977, Site 8 was used by the United States Air Force (USAF) as a storage area for drums containing HO. In 1977, the HO drums were removed from Site 8, transported to port by railroad, and placed on a ship for destruction by incineration in the South Pacific. HO is a herbicide formulation using an equal mixture of two agricultural herbicides [2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T)] in diesel fuel or jet fuel. Spills and leaks of HO that occurred within Site 8, contaminating the surface soil and sediment with the mixture components, 2,4,5-T and 2,4-D, as well as byproduct contaminants (dioxins and furans), primarily 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). The release of dioxins at Site 8 was confirmed in 1977, and the site was fenced and left inactive until 1985 (TtNUS, 2003a). It was originally believed that 13 acres of Site 8 were used to store approximately 850,000 gallons of HO. This 13-acre area is currently referred to as Site 8A (HLA, 2000).

In 1985, the USAF began operations to clean up the dioxin-contaminated soils that remained on site following the removal of the drums of HO. The contamination of soils resulted from spills and leaks during the 10 years that HO was stored at Site 8. Through a Research, Development and Demonstration permit obtained through the EPA Region IV, the USAF conducted test burns to demonstrate that incineration was capable of reducing dioxin concentrations in site soils to less than the EPA criterion (as of 1985) of 1.0 microgram per kilogram ($\mu\text{g}/\text{kg}$). During the test burns, two additional areas outside the original 13 acres were identified and verified as previous storage locations for drums containing HO. These two areas were designated as Sites 8B and 8C.

Following EPA acceptance of the test burn data, full-scale incineration of dioxin-contaminated soils from Sites 8A, 8B, and 8C was conducted. The incineration process was conducted within the boundaries of Site 8A and was completed in 1988. The ash that remained from the incineration process was stored and currently remains on Site 8A. Although the soils within Sites 8A, 8B, and 8C were incinerated, the drainage channels that carry surface water and sediment from these sites to the lower reaches of the local drainage basin were not addressed during this remedial effort (HLA, 2000).

Between 1987 and January 2001, access to Site 8A was restricted and operations were not conducted within site boundaries. Since January 2001, activities conducted within Site 8 include the construction of a new loading ramp in anticipation of using the site as a storage and staging area (TtNUS, 2003a) and the performance of a pilot-scale treatability study for remediating soil ash and contaminated on-base and off-base AOC sediments (TtNUS, 2001). Sites 8B and 8C are well vegetated.

In August 2002, the Navy performed a sediment removal action in the drainage channels of Sites 8B and 8C. Approximately 2,600 cubic yards (yd³) of sediments were excavated from 3,800 linear feet of drainage channels and transported to Site 8A.

Remedial activities were also conducted within the off-base AOC. As part of pilot-scale activities in November and December 2001, dioxin-contaminated sediment located within the off-base AOC was excavated and transported to Site 8A. Approximately 1,000 yd³ of material located on property owned by Mr. H. A. Edwards (the Edwards property) were excavated. A sediment recovery trap (SRT) was installed at the western extent of the excavation to prevent recontamination of this area from up gradient sources. Verification sampling determined that dioxin concentrations [total toxicity equivalents (TEQ) of TCDD] were below the MDEQ unrestricted Tier 1 Target Remediation Goal (TRG) of 4.26 nanograms per kilogram (ng/kg) (TtNUS, 2002). Additionally, in April 2003, 30 yd³ of dioxin-contaminated sediment were excavated from an area adjacent to a culvert that runs beneath Canal Road. The excavation was performed to enable the city of Gulfport to perform a culvert replacement project. An SRT was installed at the eastern extent of the excavation (TtNUS, 2003a).

For additional details on site history, refer to Section 1.3 of the Remediation Planning Document (HLA, 2000).

1.2 Summary of Existing Site Data

An overview of previous investigations performed at Site 8 is presented in Section 2.3 of the 100% Remedial Design (TtNUS, 2004). A complete list of references for reports generated from previous studies is included in Section 9.0 of this report.

2.0 PROJECT ORGANIZATION PERSONNEL

This section describes ECC project personnel, subcontractors, and offsite partners

2.1 Program Manager

Mr. Raghu Arora, Professional Engineer (PE), will be the Program Manager (PRM) for this project. PRM duties and responsibilities include the following:

- Overall contract conformance to Navy requirements and specifications, including technical, cost, and schedule;
- Overall responsibility for the success and proper execution of the project;
- Review of all required submittals;
- Designation of the Project Manager (PM) and Quality Control Manager (QCM); and
- Allocation of sufficient resources, to ensure successful completion of the project.

2.2 Project Manager

The responsibilities of the Project Manager (PM), Mr. Prashant Khanna, are as follows:

- Overall management of project technical, quality, cost, and schedule performance;
- Supervision of the Site Superintendent (SS) and coordination with the QCM;
- Review of all work in progress and submittals;
- Resolution of project quality issues;
- Development of project plans, reports and associated documentation; and
- Scheduling of activities and adhering to or adjusting the project schedule.

2.3 Quality Control Manager

The QCM, Mr. Bob Anderson, reports to the Program Quality Control (QC) Manager, Mr. Rich Gioscia, CQA, ECC's Corporate QC Manager. The QCM's responsibilities include:

- Ensuring that all materials, workmanship, inspection, sampling, and testing are in compliance with contract documents, including drawings and specifications;
- Ensuring compliance with the Work Plan (WP), Quality Control Plan (QCP), and Site Health and Safety Plan (SHSP);
- QC of project plans and project data;
- Ensuring that deviations from Standard Operating Procedures (SOPs) or the scope, if necessary, are properly approved and documented;
- Ensuring subcontractors perform their assigned and contracted tasks in a quality manner;
- Providing QC oversight to subcontractor data collection and reporting efforts; and
- Project documentation, including Daily Quality Control Reports (DQCRs), inspection reports, photographs, etc.

2.4 Site Health and Safety Specialist

The Site Health and Safety Specialist (SHSS) will implement the SHSP and will be responsible for the following tasks:

- Oversee and enforce the SHSP;
- Ensure that on-site training occurs and that the SHSP is implemented on site;
- Oversee site activities on a full-time basis for the entire duration of field activities;
- Ensure site activities are conducted in accordance with specific health and safety requirements, federal and Occupational Safety and Health Administration (OSHA) regulations, and all aspects of the SHSP, including, but not limited to, activity hazard analysis (AHA), air monitoring, use of personal protective equipment (PPE), decontamination, site control, SOPs used to minimize hazards, safe use of engineering controls, the emergency response plan, and preparation of records by performing a daily health and safety inspection, and documenting the results;
- Serve as a member of the QC staff on matters relating to health and safety;
- Halt work in consultation with the PM if unacceptable health and safety conditions exist and take necessary action to re-establish and maintain safe working conditions;
- Check employees at the start of each work shift to be sure each is fit to perform the assigned tasks;
- Continually evaluate all supervised employees for safety knowledge, physical limitations, and current job knowledge;
- Ensure that each individual understands and follows the precautions to be taken to mitigate potential hazards;
- Give specific safety instructions as part of the job instructions for each work assignment, based on first-hand knowledge of the tasks and the task environment; and
- Discuss the potential hazards of a given operation with appropriate personnel;

2.5 Site Superintendent

The SS, Mr. Robert E. Anderson, reports directly to the PM. The primary responsibilities of the SS are:

- Coordination with the QCM and the SHSS to ensure quality and safety of all field activities;
- Supervision and coordination of all project field activities;
- Oversee spill prevention and any necessary cleanup action;
- Communication with the Resident Officer in Charge of Construction (ROICC) and authorized site visitors; and
- Preparation of Daily Reports and other documentation associated with field activities.

2.6 Site Manager

Construction QC will be supervised by the QCM and the Site Manager, Mr. Graham McMorine. The Site Manager will make visits to the site to observe construction activities, review all submittals, and supervise additional field QA personnel. Additional Field QA personnel will observe and document QC activities on the installation of the rolled-concrete cap, as directed by the EPA guidance document “Construction Quality Control and Quality Assurance for Waste Containment Facilities”.

The Site Manager will be responsible for certifying that the site has been constructed in accordance with the contract drawings and specifications and overall project objectives. The certification statement will be accompanied by a final Certification Report that contains the appropriate documentation, including daily observation reports, sampling locations, test results, drawings of record or sketches, and other relevant data.

2.7 Subcontractors

Subcontractors will be selected by ECC to perform specified tasks under this project, including topographic surveying, excavating contaminated material, geotechnical sampling and testing, chemical analyses, concrete cap installation, and wetlands restoration. All subcontractors will report to the PM or his designee, and furnish all personnel, equipment, and materials required for their delegated tasks. Although ECC expects subcontractors to ensure the quality of their own work, the site supervision, inspection, and approval of all subcontracted work will be the responsibility of ECC. All subcontractors will agree to adhere to the procedures identified in the project plans and to follow the procedures and QC (and site safety) protocols designated therein.

2.8 Offsite Partners

Offsite partner organizations will be utilized to perform selected actions of quality control. Offsite laboratories will provide chemical and geophysical analytical services. The design or engineering firm, Tetra-Tech NUS, Inc. (TtNUS), will collaborate with ECC as described below.

2.8.1 Testing and Monitoring Laboratories

Field and laboratory testing of soil materials and the concrete cap will be required during this project. Geotechnical testing of soil materials and the concrete cap will be performed by a certified testing laboratory.

Columbia Analytical Services, Inc (CAS) will perform chemical analyses of the stabilized material. The address for CAS is:

10655 Richmond Ave., Suite 130A
Houston, Texas 77042
Phone: 713-266-1599
Fax: 713-266-0130

2.8.2 Architectural and Consulting Engineering Firms

Design and construction oversight will be accomplished through a team effort between ECC and TtNUS. TtNUS will provide report preparation support, peer review, regulatory compliance, engineering design, construction quality assurance and quality control, and permitting plans.

3.0 PRE-DESIGN INVESTIGATION SUMMARY

TtNUS performed Pre-design Investigations (PDIs) at Site 8A and the off-base AOC to support the RD effort for Site 8, contiguous on-base drainage channels, and the associated off-base AOC described in Section 4 of this plan. The objectives of the PDIs were to establish mixing ratios for the stabilization process, evaluate bearing capacity of stabilized material, verify and identify existing site features and conditions, delineate off-base wetlands, and obtain base topographic and feature mapping. The PDI field activities and results are described below.

3.1 Pre-Design Investigation Field Activities

TtNUS and supporting subcontractors conducted the following PDIs in support of the Site 8 RD effort:

- A bench-scale treatability study was conducted in the late summer and fall of 2000;
- A follow-up pilot-scale treatability study was conducted in July and August 2001;
- A wetland specialist delineated the wetlands in the off-base AOC in October 2002; and
- Ground surface topography and physical features were surveyed during October and November 2002.

3.2 Pre-Design Investigation Results

The following subsections describe the results of the PDIs.

3.2.1 Bench-scale Soil/Sediment Treatability Study

A bench-scale treatability study was conducted to determine whether the soil ash, contaminated on-base sediments, and contaminated off-base AOC sediments could be excavated and consolidated into a material blend that is suitable to support a structural cap, that could be used as a heavy equipment storage area (TtNUS, 2001). The evaluation criteria used to determine the suitability of the material blend were a minimum California Bearing Ratio (CBR) of 20 and a minimum 28-day unconfined compressive strength (UCS) of 50 pounds per square inch (psi).

Results of a vertical delineation study conducted in the off-base AOC (TtNUS, 2003c) and refined volume estimate calculations have determined that the estimated volume of contaminated off-base AOC sediment is approximately 28,800 yd³ (versus a 13,000 yd³ estimate prior to the study). However, the results of the third tier of bench-scale testing indicate that this volume increase should not adversely impact the load-bearing characteristics of the stabilized base for the structural cap.

3.2.2 Pilot-scale Soil/Sediment Treatability Study

TtNUS conducted a pilot-scale treatability study during the last half of 2001. The purpose of the pilot-scale study was to determine the feasibility and practicality of implementing the findings of the bench-scale treatability study on a scale representative of actual remedial operations (TtNUS, 2001). The primary objectives of the pilot-scale study were as follows:

- Determine the most effective methods for excavating and transporting the soil ash (contaminated blackish gray, fine-grained, uniformly-sized silty, SAND), contaminated on-base sediment, and contaminated off-base AOC sediment from their current locations.
- Verify the effectiveness of a mechanical vibrating screen for the removal of oversized particles from the material blend.
- Determine the most effective method of removing excess free water from the sediment excavated from the on-base drainage channels and off-base AOC.
- Determine the most effective method for mixing the soil ash, contaminated on-base sediment, and contaminated off-base AOC sediment into a homogeneous material blend and for mixing the material blend with the required Portland cement to form the stabilized material blend.
- Determine the most effective method of grading the stabilized material blend.
- Verify that the load-bearing capacity and dioxin leachability of the stabilized material blend are within required technical limits.

3.2.3 Conclusions of the Treatability Study

The following conclusions and recommendations were drawn from the results of the pilot-scale treatability study (TtNUS, 2001):

- Excavation in the off-base AOC could not be effectively conducted during the rainy (summer) season and had to be postponed to a dryer (late fall) season.
- The Pass Road gate (eastern NCBC gate) was used during the pilot-scale treatability study; however, the use of one of the northern entrances during full-scale operations would increase excavation/hauling rates by reducing the round-trip distance by approximately 1.5 miles.
- Dump trucks with gasketed tailgates will be used for material transport during full-scale operations. This action would eliminate material handling problems encountered with the plastic bed liners during pilot-scale material blending activities and will result in an increase in the material-hauling rate.

- Two methods of premixing the material blend were conducted in the treatability study. The first method involved loading alternating bucket loads of the material blend components into dump trucks until the trucks were full and then hauling the material to the test pad. The second method involved premixing the material blend components in batch piles at the materials handling pad with a wheel excavator and then transporting the premixed material to the test pad in dump trucks. Observations indicate that material premixed by the second method was more homogenous than that premixed by the first method. However, premixing by the second method resulted in a slower material-hauling rate to the test pad area when compared to the first method.
- The soil stabilizer effectively mixed the stabilized material blend at the test pad. After one pass of the soil stabilizer, visual observation of the stabilized material blend and the use of an alkaline indicator (phenolphthalein) indicated a homogenous mixture.
- Pilot-scale treatability study activities indicated that one to three passes with a vibratory roller are required to achieve compaction results that are a minimum 90 percent of maximum dry density. Areas of the test pad with higher moisture contents required more passes with the vibratory roller than those with lower moisture contents. For Lift No.1 (moisture content of 11.7 percent after cement addition), only one pass with the vibratory roller was required to achieve 90 percent maximum dry density. For Lift No.2 (moisture content of 16.2 percent in the northwestern half and 18.5 percent in the southeastern half), three passes were required.
- The results of all of the CBR tests performed on the test pad were well in excess of the minimum CBR requirement of 20. These results were achieved by the third day of curing.

Based on CBR results, extensive dewatering of the material blend components would not be required during full-scale operations. Synthetic Precipitation Leaching Procedure (SPLP) leachate results indicated that dioxin contamination in the stabilized material blend would not leach from the stabilized material at concentrations harmful to human health. Dioxin analysis conducted on a water sample collected from the materials handling pad sump indicated that water collected from the sump during full-scale operations would not need to be treated before it is discharged to a storm water drainage channel.

3.2.4 Wetland Delineation

Appendix C of the 100% RD presents a delineation of those areas within the off-base AOC that satisfy the definition of wetlands used by the EPA and the United States Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (33 USC 1344).

3.2.5 Topographic Survey

TtNUS contracted Land Surveying Inc., professional land surveyors from Gulf port, Mississippi, to complete a topographic and point survey within Site 8A and the off-base AOC north of NCBC in October and November 2002. The ground surface topographic survey covered the limits of Site 8A and the limits of the delineated wetland boundary in the off-base AOC. The surveyor also identified the boundary of the wetlands defined by the wetlands specialist in June 2001.

3.3 Conclusions

The following conclusions were derived from the PDIs:

- The material blend should not be consolidated under a structural cap at Site 8A without amendment using a stabilization agent.
- The material blend should be stabilized with 5 to 10 percent by weight of Portland cement prior to placement under the Site 8A structural cap.
- Excavation of sediment in the off-base AOC should not be conducted during the rainy season (typically May to September). Excavation of this material should be performed during the drier months.
- The use of dump trucks with gasketed tailgates should be considered for material transport during full-scale operations. Eliminating the need to replace the dump truck's plastic bed liners on each round trip would increase the rate of material hauling.
- Use of either pilot-scale treatability study premixing method is acceptable.
- Based on CBR results, dewatering of the material blend components would not be required during full-scale operations.
- Most of the potentially contaminated areas within the off-base AOC (i.e., Bennett and Arndt properties) meet the technical criteria for wetlands established in the 1987 USACE Wetlands Delineation Manual.
- All of the wetlands within the off-base AOC are non-tidal, freshwater wetlands regulated as a water of the United States under Section 404 of the Clean Water Act.
- None of the wetlands within the off-base AOC are "coastal wetlands" regulated under the Mississippi Coastal Wetlands Protection Act (Mississippi Code §49-27).

4.0 OVERVIEW OF 100% REMEDIAL DESIGN

The following section provides an overview of the 100% RD for Site 8 - Herbicide Orange Storage Area and off-base area of contamination (TtNUS, 2004).

4.1 Regulatory Framework

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and Superfund Amendments and Reauthorization Act of 1986 (SARA) established a program for the cleanup of hazardous waste disposal and spill sites nationwide. This program contains provisions for the cleanup of contamination from the release of hazardous substances and is the framework for Installation Restoration (IR) programs at Navy and Marine Corps installations. RCRA, as amended, also establishes a cleanup program that provides for current and future hazardous waste management practices, as well as cleanup of past disposal sites at permitted or interim status Navy/Marine Corps installations. SOUTHDIV NAVFAC has the responsibility for implementing the Navy's IR Program at NCBC Gulfport, Mississippi.

4.2 Selected Remedy

The Agreed Order stipulated that the Navy and Air Force would manage remediation of the Herbicide Orange Storage Area (Site 8) and associated off-base AOC as a single RA. The remediation will address soil ash at Site 8A, contaminated sediments in on-base drainage channels, and contaminated sediments in the associated off-base AOC. The selected remedy for Site 8A, on-base drainage channels, and associated off-base AOC described in the focused feasibility study (FFS) as Alternative 3 consists of excavation, surface water controls, dewatering, chemical stabilization, on-base land filling, capping, institutional controls, and monitoring. The Remedial Action Objectives (RAOs) identified in the FFS for Site 8A, on-base drainage channels, and the associated off-base AOC are as follows:

- Protect human health from the carcinogenic and non-carcinogenic risks associated with incidental ingestion of, inhalation of, and dermal contact with contaminated surface soil and sediment.
- Protect human health from the carcinogenic risks associated with ingestion of and dermal contact with on-site and off-site groundwater.
- Comply with federal and State Applicable or Relevant and Appropriate Requirement (ARARs) and to be considered (TBC) guidance criteria in accordance with accepted EPA and MDEQ guidelines.

The selected remedy described in the FFS as Alternative 3 consists of excavating and treating approximately 70,000 cubic yards of soil ash and sediment from Site 8A, on-base drainage channels, and the associated off-base AOC.

The selected remedy consists of the following components:

- Performance of a bench-scale treatability study to identify treatment parameters capable of achieving the site physical and chemical criteria for remediation;
- Excavate dioxin-contaminated sediment from on-base drainage channels contiguous to Site 8 and from an associated off-base AOC located north of the base and excavate soil ash located at Site 8;
- Consolidate, homogenize, and stabilize soil ash and contaminated sediment within a portion of Site 8;
- Construction of a concrete cap over the stabilized material;
- Perform verification sampling;
- Restore the on-base drainage channels and off-base AOC affected by excavation activities;
- Implement land-use controls; and
- Perform long-term monitoring.

Specific requirements and performance standards for these components are presented in the 100% RD.

5.0 PERMITS FOR CONSTRUCTION

The remedial/corrective action activities will comply with the substantive aspects of ARARs and permit requirements. Permits may be required for construction-related off-site activities (e.g., temporary utility connections, borrow materials, etc). Construction-related permits have been identified and ECC will be responsible for obtaining them. These construction-related permits have been incorporated as a submittal requirement into the specifications.

Remediation and construction activities will be performed under the existing General National Pollution Discharge Elimination System (NPDES) Permit obtained by TtNUS for Storm Water Discharges from Construction Activities. ECC will ensure that all personnel are qualified to perform the work as outlined in the Permit regulations. ECC understands that compliance with all conditions of the Permit is mandatory and that non-compliance would constitute a violation of the Mississippi Pollution Control Act and the Clean Water Act and would be grounds for enforcement action; for Permit termination, revocation and re-issuance, or modification; or for denial of a permit renewal application. The Permit regulations are required to be onsite during performance of the work.

A Nationwide Permit 38 (NWP 38) will be obtained, if applicable or at the discretion of the USACE District Engineer, for excavation of sediment from the off-base AOC. NWP 38 is for activities required for removal of hazardous or toxic waste materials that are performed, ordered, or sponsored by a government agency with established legal and regulatory authority. Application will be made to the District Engineer sufficiently in advance of the planned project activities, and activities will not begin until the permit recipient has been notified in writing by the District Engineer that activities may commence.

A Storm Water Construction General Permit will be obtained for discharges of storm water from construction activity. The Permit will be obtained from the MDEQ Office of Pollution Control (OPC, 2000).

A permit for project wetland activities to be performed within the Mississippi Coastal Zone will be obtained from the Mississippi Department of Marine Resources (DMR). Details of permit application are included in the Storm Water Pollution Prevention Plan (SWPPP).

6.0 SITE SECURITY

Specific site security issues may be applicable to work areas, depending on the designated work location, the manner of work being performed, and NCBC facility operating procedures. These security issues may include facility background clearances, facility badges, escorts, and/or vehicle passes. ECC will provide fencing and project signs as necessary to identify project area restrictions and hazards. Security issues will be identified and addressed during mobilization activities.

Site security during off-hours will include locking gates at all construction entrances/exits. Gates will be locked at all times when remediation activities are not being conducted. Excavations that exceed 4 feet in depth will be enclosed with high-visibility safety fencing placed five feet from the edge of the excavation. “Danger - Do Not Enter” signs (or equivalent) will be posted along the safety fencing. Safety fences and signs will be inspected at the end of each work shift and repairs will be implemented, as necessary. Safety fences and signs will be moved and/or added to as the excavation proceeds. Safety fences and signs will be removed after the excavations have been backfilled.

All persons and vehicles arriving on-site during remediation activities will be entered on a personnel or vehicle log sheet. Visitors will be required to sign in at the project office trailer and will be escorted within the project boundaries by ECC personnel.

7.0 PROJECT EXECUTION

This section presents each feature of the work and describes the sequence of activities planned for accomplishing the remedial action goals.

7.1 Definable Features of Work

As part of the scope of work, ECC will perform the following definable features of work (DFW):

- Perform bench scale treatability study;
- Mobilize and site setup;
- Establish temporary soil erosion and sediment control;
- Perform site clearing;
- Perform monitoring well abandonment;
- Perform contaminated sediment excavation;
- Perform solidification / stabilization of contaminated sediments;
- Construct final cap system;
- Restore site; and
- Demobilize.

7.2 Project Plans and Permits

Prior to mobilization, ECC will present the required plans to stakeholders for review, comment, and approval. ECC will ensure each of the following are finalized prior to initiation of site work:

- Remedial Action / Corrective Action Work Plan;
- Solidification / Stabilization Bench Scale Treatability Work Plan;
- Storm water Pollution Prevention Plan (SWPPP);
- Site Health and Safety Plan (SHSP);
- Quality Control Plan (QCP);
- Sampling and Analysis Plan (SAP); and
- Quality Assurance Project Plan (QAPP).

Prior to initiation of site activities, ECC will ensure that the following permits are submitted and authorized:

- Joint Application and Notification;
- NWP 38, if required;
- Storm water – Construction General Permit, Construction Notice of Intent (NOI);
- Project wetlands activities permit; and
- DMR Wetland Project Activity Permit.

7.3 Bench Scale Treatability Study

ECC will initiate the Bench-Scale Treatability Study (BSTS). The BSTS will be performed to identify:

- The characteristics of the as-received site samples;
- The characteristics of various material blends developed using the three site samples;
- Various reagents and additive rates capable of effectively treating the composite material; and
- The physical and chemical characteristics of the treated materials

ECC will collect the samples from areas identified by TtNUS. The sample locations selected will be points where higher concentrations of dioxin are likely for each of the three waste types.

Sample analysis will be completed according to the BSTS Work Plan (ECC, 2004). Kemron, Inc. will perform the analytical work and will provide ECC with a detailed report of the findings. The findings will be reviewed and the incorporated into the execution of the solidification and/or stabilization actions of this RA/CA work plan.

7.4 Mobilization

Site mobilization operations will be completed prior to commencing the prescribed project operations. Site mobilization includes mobilization of required personnel and equipment to Site 8. Mobilization of most resources will occur at the onset of the project.

ECC will mobilize project personnel from areas outside and from within the local region. All personnel working at the Site will possess the appropriate skills and knowledge necessary to function in their specified capacity. They will all have completed the necessary health and safety training and physical evaluations to ensure they are able and fit to complete their assigned duties in a safe and efficient manner. The SHSP presents all health and safety related requirements for project personnel. ECC will provide a complete list of subcontractors to NAVFAC upon their selection.

Equipment will be mobilized as needed and released when no longer required. Equipment required for the work will include:

- Crew vehicles;
- Earth moving and conventional excavators;
- Motor grader;
- Pug mill;
- Front end loaders;
- Soil stabilizer SS240; and
- Dump trucks.

All equipment will be maintained in good working condition and possess all required safety and operational controls. Inspections upon delivery are required in the SHSP. Daily safety and operational checklists will be completed for all equipment.

7.5 Site Setup

Site setup actions include performing a pre-existing site condition inspection and utility locates, establishing temporary facilities, delineating construction areas, establishing work zones, installing temporary access roads, placing critical erosion and sediment control devices, site clearing, and placing office and support trailers.

7.5.1 Delineation of Construction Areas

ECC will mobilize a Mississippi Registered Land Surveyor (RLS) to perform staking and marking of construction areas to be excavated. Adequate marking will be performed during site setup and throughout the remedial action to ensure that excavation is completed to the contours, elevations and dimensions indicated by Figures 7-5 through 7-7 (RD Drawings C15 through C17). The RLS will stake out the excavation area with a grid based on a node spacing of 50 feet. The node stakes will indicate vertical extent of excavations. Perimeter stakes will indicate the lateral extent of excavations.

7.5.2 Temporary Facilities

An office trailer and storage container box will be mobilized to a location designated by the ROICC. Power and telephone services will be installed by a licensed electrician and the local phone company, respectively. Portable toilets will be sited at the trailer location and at the landfill area. Other temporary facilities will include hand washing stations and a fuel cell.

The Navy will provide a 550-gallon ASt with secondary containment. ECC will have tarps available to cover during rain events and during off hours. The fuel cell will have proper signage, a spill control supplies can, and suitable fire extinguishers.

7.5.3 Work Zones

Temporary fencing, gates, and warning signs will be established to identify the work-site boundaries and clearly delineate the three types of work zones: Exclusion Zones (EZ), Contamination Reduction Zones (CRZ), and Support Zones (SZ). These site security features are part of the overall site security protocol for the site. The site security protocols are described in detail in the SHSP.

The EZ and CRZ, where handling and processing of contaminated materials are present, will be posted with signs declaring “WARNING HAZARDOUS WORK AREA, DO NOT ENTER UNLESS AUTHORIZED.”

Temporary fencing, gate, and warning signs will be checked on a routine basis. If deterioration of the site security fence is observed, if gate is left unlocked, or if warning signs are removed, the deficiency will be corrected.

7.5.4 Temporary Roads and Material Handling Areas

ECC will construct temporary access and haul roads at the off-base AOC and along the drainage channels and other locations, as needed. ECC will limit the number of constructed haul roads on base and use matting where possible.

The access road and diversion channel constructed through the AOC will provide continuous access for construction equipment and to divert surface water from excavations. Figure 7-1 (RD Drawing C-8) shows the planned locations for these features. The temporary access road will be approximately 3,090 feet long with a width of 20 feet and average fill height of 2 feet above existing grade. The road will be constructed under direction of the Site Superintendent. The road will likely be constructed of felled trees, compacted soil, and top layer of gravel. Based upon materials required for construction of a previous access road in the off-base AOC, it is estimated that 7,300 yd³ of fill and 1,400 yd³ of stone aggregate will be required. A contingency plan will be in place if owners or regulatory agencies if the log roadbed needs to be removed.

Approximately 3,150 feet of haul roads will be constructed to allow access to the on-base drainage channels. Temporary construction entrances / exits will be installed to provide access to Site 8A from Greenwood Avenue, to Site 8B from Holtman Avenue, to on-base drainage channels from Brown Avenue and Eight Street, and to the off-base AOC from 28th Street. Figure 7-2 (RD Drawing C-16) shows the planned on-site haul roads and the construction entrances from Greenwood Avenue and Holtman Avenue.

To prepare for waste processing and placement activities, ECC will construct necessary material handling areas at Site 8A. This will include bermed and lined wheel-wash decontamination stations at the landfill site. These stockpile areas will be constructed in accordance with Specification 02160A. In addition, Figures 7-3 and 7-4 (RD Drawings C-13 and C14) demonstrate the construction detail for these features.

7.6 Temporary Soil Erosion and Sediment Control

Before clearing and excavation activities begin on site, erosion, sediment, and storm water control devices will be established to prevent impacts to areas adjacent to and down gradient of the excavation limits in accordance with NPDES permit and best management practices. The erosion, sediment, and storm water control devices will be regularly inspected and maintained during excavation and backfilling operations and until vegetation is established. Erosion, sediment, and storm water control regulations of the Mississippi Commission on Environmental Quality Regulation WPC-1 will be complied with during these activities. Erosion controls will include storm water diversion channels, culverts, surface roughening techniques, and temporary seeding strategies.

The diversion channel constructed along the off-base AOC haul road will extend the entire length of the road, approximately 3,090 feet. Six 30-inch diameter corrugated metal culverts will be constructed under the access road to allow for unimpeded movement of surface water and to prevent increased ponding in adjoining areas of undisturbed wetlands during construction

Sediment controls will include silt fencing; sediment control logs sediment recovery traps, and culverts. During excavation of sediments from the drainage channels sheet piling and pumping systems will be used to prevent flow of contaminated sediments from unremediated sections into remediated sections.

Sediment control logs or similar devices will be the most effective means of eliminating soil contamination or significant turbidity from leaving excavations in wetlands areas. Sediment control logs consist of rolled straw or coconut matting. The logs will be staked into the wetlands soils around the area that is to be excavated each day. The erosion control logs will be moved each day so that each day's excavation area is contained. In the event excavation is required in an area deeper than 12 inches, a silt curtain may be used.

In the event of a hurricane or other large storm event, all non-essential silt fences and erosion control logs will be removed. By observing weather forecasts, sufficient advance warning will be available for backfill to catch up to excavation and minimize exposed excavation areas prior to the storm event. All essential silt fences and erosion control logs will be secured. Special attention will be given to the silt fences around the perimeter of the landfill. Silt fences will be secured and augmented with earthen berms or ditches as necessary.

Full discussion of the site erosion control and sediment control practices is provided in the SWPP, Appendix A.

7.7 Site Clearing

A local specialty subcontractor will be utilized for Site clearing. Vegetation will be removed to within 6 inches of the ground surface and then properly disposed. Site clearing will be performed in a manner that does not disturb or damage existing vegetation, structures and other facilities not indicated to be removed. Trees not designated to be removed and will be protected during construction activities until completion of the work. Before commencing the work, trees that are to be saved will be protected from damage by use of high visibility orange safety fencing, or other suitable protective measures. Stumps and roots of vegetation will not be removed. Logs and all other vegetative material resting on the ground surface will be removed. Disturbance of the ground surface during removal of vegetation will be minimized to the extent practicable.

Clearing will take place on a phased basis so not to expose areas that are not imminently scheduled for excavation work.

7.8 Monitoring Well Abandonment

Three monitoring wells (APT-A-2, APT-A-3, and APT-A-4) located within the limits of Site 8A and six temporary wells (WG001, WG002, WG003, WG004, WG005, and WG006) located within the off-base AOC will be abandoned by ECC in accordance with the EPA Region 4 Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM) (EPA, 2001) and Mississippi State regulations.

7.9 Contaminated Sediment Excavation

Excavation will commence when site-clearing activities are completed. The limits of each excavation will be defined as described in Section 7.5.1 and as illustrated by Figures 7-5 through 7-7 (RD Drawings C15 through C17). All excavation work will be performed in accordance with project specification 02315N, Excavation and Fill.

The soil ash is currently located in piles on Site 8A, Figure 1-3, and is a product of soil incineration conducted by the USAF in the mid-1980. The total in-place volume of soil ash and incidental soil to be excavated is approximately 23,000 yd³. Soil ash will be excavated and transported to the materials staging area where it will be stored prior to blending with contaminated sediments.

Approximately 20,200 yd³ of in-place contaminated sediments will be excavated from on-base drainage channels that receive and convey flow from Site 8. Figures 7-5 and 7-6 (RD Drawings C15 and C16) show drainage channels designated for excavation work. Approximately 27,725 yd³ of contaminated sediment also will be excavated from the off-base AOC as outlined by Figure 7-7 (RD Drawing C17).

The contaminated sediments from these locations will be transported to Site 8A where the excess water in the material will be allowed to drain prior to blending with soil ash. Run-off from the material piles will be contained inside the diversion berms. The water will be collected and containerized for sample collection and analyses. Excavation of contaminated sediments will continue until verification samples indicate that contaminated sediments have been removed or that concentrations of dioxins are less than the TRG, as shown in Table 7-1.

Table 7-1. Target Remediation Goals

Sediment COC	Selected Ecological TRG
Dioxin	0.038 ug/kg

7.9.1 Excavation Process

Equipment to be used for excavation of impacted soils and sediments may include a long-stick excavator and a conventional excavator. The long-stick excavator will be used for excavation of wet sediments from the far reaches of the wetlands marsh. Support mats might be utilized to provide stable foundation for the tracks. A conventional excavator will be used for excavation of drier sediments and landfill wastes.

The excavator operators will excavate to the grades shown on the stakes placed by the RLS. During excavation of each area, a laser level will be utilized to control the depth of excavation. A laser level will be setup at a location that will be undisturbed by the excavation operations and use a control rod in the actual excavation. The grade checker will perform frequent measurements with the control rod to control the depth of the excavation. A confirmation survey will be conducted after excavation to verify complete excavation and produce a post excavation topographic figure.

Dump trucks will be employed to transport the excavated materials to Site 8A. The truck beds will be sealed with gaskets to prevent any liquids or contaminated material from escaping during transport. If liquids and/or contaminated material are observed to be dripping from the truck bed, the truck will not be allowed to leave the excavation area until the leak has been stopped.

ECC will monitor fugitive dust using particulate monitors at the fence-line and within the immediate work areas for worker protection during all excavation operations in accordance with the SHSP. If fugitive dust is visually observed or detected on the monitors, ECC will implement dust controls. Water for dust control will be obtained by an approved source which will be discussed during the pre-construction meeting. Excavation operations creating a significant amount of visual dust or at levels in excess of Site thresholds levels will cease until effective dust control measures are in place.

Dust control will be achieved using water sprayed from a water truck having a one- or two-inch diameter pressurized hose. The hose will be capable of spraying a fog stream at least 100 feet. The water truck will also have a spray bar and/or side spray nozzles. All dust monitoring and mitigation methods will be performed in accordance with the SHSP.

Equipment used for excavation and grading of impacted soils and sediments will be decontaminated prior to being used in landfill soil cover construction or being removed from the Site.

Sediments removed from the erosion and sediment control devices during general maintenance will be conservatively handled as contaminated sediment and will be transported to the materials staging area to be blended, stabilized, and placed on Site 8A. Sediments removed from the erosion and sediment control devices after verification that contaminated sediment has been removed from the excavation areas will be used as backfill material.

7.9.1.1 Verification Sampling

Verification samples will be collected from the on-base drainage channels and off-base AOC. Samples will be collected on an on-going basis upon reaching the excavation vertical and horizontal extents of each grid section. ECC sampling personnel will comply with all procedures outlined in the FSP and QAPP for collection and management of the verification samples.

7.9.1.2 Sequence of Excavation Work

As recommended in the 100% RD, ECC will begin the excavation work at the off-base AOC and transport all sediment to Site 8A. The off-base AOC area is illustrated by Figure 7-7 (RD Drawing C-17). Following verification that the remedial goals have been achieved in an excavation section, that section will be immediately restored. The restoration process is described in Section 7.12. When all of the off base AOC excavation and restoration is complete, ECC will remove the sediment recovery traps and the temporary access roads put in place to complete the material excavation and transfer.

Subsequent to completion of the AOC restoration, ECC will excavate all soil ash from current piles and transport to Site 8A. Excavation of soil ash will continue until the stabilized soil/native soil sub-grade is encountered. Following the excavation and transport of the ash from Site 8A, ECC will establish the perimeter channels and stabilize with the erosion control measures and by seeding with the permanent seed mixture as described on RD Drawing C-12. ECC will then modify the existing Site 8A culverts as required and install the new culvert. ECC will dewater the existing channels and compact the remaining soil at Site 8A, where required, to achieve a suitable sub grade for placement of the stabilized material blend.

The on-base drainage channel sediment will be addressed upon completion of the soil ash excavation process. ECC will install necessary haul roads along the drainage channels and then sequentially excavate the channels beginning with the most-downstream location, as identified on Figures 7-5 and 7-6. ECC will employ channel segregation devices and pumps to restrict the disturbed channel to manageable lengths.

7.9.2 Waste Sediment Processing

All contaminated sediments will be transported to the material staging area. There, the materials will be stockpiled and excess water will be allowed to drain from the material. The water that results from this dewatering operation is expected to require only clarification through an approved sedimentation device (e.g., portable sediment tank) and will, therefore, not require collection and formal treatment. This design assumption is based on the tendency of the contaminants to adhere to suspended solids and the results of the BSTS. A water sample will be taken to ensure proper disposal.

When sufficiently dewatered, the soil ash, contaminated sediment, incidental soils resulting from over-excavation, and size reduced vegetative material will be blended to create a homogenous mixture. The blend ratios will be determined from the results of the BSTS.

7.10 Solidification / Stabilization of Contaminated Media

This section describes the processes to be executed to successfully stabilize and place the material blend. Specification 02160A presents full detail of the requirements for these activities. Generally, the process will include: constructing and maintaining material handling areas, preparing the landfill sub grade, performing a field demonstration of the stabilization process, performing full-scale stabilization (full-scale mixing and placement of stabilized blend), sampling stabilized material from test sections for geotechnical testing and confirmation analyses.

The material blend will be stabilized such that dioxin contamination does not leach from the material and to provide a base layer capable of supporting the roller-compacted concrete cap. The stabilized material blend will be placed within the 13-acre area footprint of Site 8A, as indicated in Figures 7-8 and 7-9 (RD Drawings C-23 and C-24).

7.10.1 Field Demonstration

At least 20 days, but not more than 60 days, prior to full-scale construction of the base course and sub base, a test section will be constructed. ECC will notify the CO at least 5 days in advance of the date of the test section construction. The test section will consist of not less than 3,000 yd³ of stabilized material blend placed and compacted in two sub base lifts and one base course lift. Prior to constructing the test section, the on-base sediment and off-base sediment sources to be used in the test section will be sampled and analyzed for dioxin contamination. The on-base sediment will prove to have at least 500 ng/kg of dioxin. The off-base sediment sources will prove to have at least 250 ng/kg of dioxin.

A full description of the Field Demonstration requirements are provided in Specification 02160A 3.4. Cement mixtures will be based on 5% of Portland cement at 50 psi (approximately 3,000 tons) and mixed with 7.5% of cement at 500 psi (approximately 650 tons). The base layers will be finished, cured, and protected according to Sections 3.8 and 3.9 of Specification 02160A. Average thickness of the placed stabilized material blend will be approximately 3 to 4 feet depending on the existing grade.

After completion of the field demonstration, material blend may continue to be processed. However, if test results from the field demonstration do not pass the performance requirements, the failing mix will be reprocessed.

7.10.2 Landfill Sub grade Preparation

The subgrade of the landfill area will be prepared prior to placement of the material blend. The sub grade will be proof-rolled after removal of soil ash and contaminated sediment with 600 percent coverage of a rubber-tired roller with large size tires with tire pressures of 40 - 50 psi.

Proof-rolled areas within Site 8A limits that show evidence of movement, rutting or shoving as determined by the CO will be dewatered, modified with a minimum of 7% Portland cement by weight to a minimum depth of 1 foot, and compacted to achieve 95% maximum dry density as tested and verified using ASTM method D1557. Historic drainage ditches and abandoned culverts will be dewatered and filled with structural fill and compacted in accordance with Specification 02315N.

The placement, spreading, drying and compaction of excavated soil and sediment materials will be continued until the top of the sediments reach the final landfill cap sub grade elevations indicated on the design drawings. The final surface of the landfill cap sub grade will be graded with a motor grader to be free from irregular surface changes. The completed sub grade will be surveyed by a RLS.

7.10.3 Full-Scale Mixing and Placement of Stabilized Blend

ECC will initiate full-scale mixing and placement of the stabilized material blend according to the blend requirements determined by the BSTS and will incorporate any process improvements as determined by the field demonstration. Approximately 69,000 yd³ of contaminated soil will be blended and stabilized using Portland cement. An average production of 1,400 yd³ per day of material will be placed in grid areas 1 through 15. Cement mixtures will be based on 5% of Portland cement at 50 psi (approximately 3,000 tons) and mixed with 7.5% of cement at 500 psi (approximately 650 tons). The base layers will be finished, cured, and protected according to Sections 3.8 and 3.9 of Specification 02160A. Average thickness of the placed stabilized material blend will be approximately 3 to 4 feet depending on the existing grade.

The material blend will be stabilized to achieve a minimum 90-day compressive strength of 50 psi. The upper 6 inches of the stabilized material blend will have a minimum 90-day compressive strength of 500 psi to provide a non-erodable base.

ECC will mix stabilizing agents and the material blend in a pug mill at determined ratios and will provide necessary moisture content for specified compaction by addition of water by weight or by volume. ECC will mix the stabilized blend until a uniform color is noted in the stabilized material blend. The method of discharging the blend will not produce material segregation.

Layers of the stabilized material blend will be placed in designated cells of the landfill area and processed with an SS240 soil stabilizer (or equivalent equipment). Compacted thickness of individual layers will not exceed the thickness as established by the field demonstration. No more than 60 minutes will elapse between start of moist mixing of the stabilized material blend and compaction of a treated layer. Layers will be of uniform thickness.

Compaction of each layer will be performed only when moisture content of the layer is within plus or minus 2 percentage points of the optimum moisture content determine at the testing laboratory. Systematic compaction will be performed as described in specification 02160A.

Finishing of the base course will be completed within 2 hours after completion of mixing operations. Finishing will entail shaping of the surface to required lines, grades and cross section in accordance with specification 02160A. At the end of each day, ECC will form a straight transverse construction joint by cutting back into completed work to form a true vertical face free of loose or shattered material.

7.11 Final Cap System

The stabilized material blend within the limits of Site 8A will be covered with a 12-inch thick roller-compacted concrete (RCC) cap. The cap limits will extend over the stabilized material blend as indicated on Figures 7-8 and 7-9 (RD Drawings C-23 and C-24). The RCC cap is only required where the stabilized material blend will be placed. Design details for the RCC cap are presented on Figure 7-10 (RD Drawing C-27)

7.11.1 Cap Design

The cap system will consist of a 12-inch thick RCC cap selected by the Navy to prevent contact with the underlying stabilized material blend and to provide a surface suitable for equipment and material storage after construction. The integrity of the RCC cap will be maintained to assure receptors will not come in contact with the underlying stabilized material blend. The design, therefore, is controlled by the ability of the RCC cap to support structural loads, in particular vehicular loading.

7.11.2 Cap Structural Design

To provide adequate durability, in consideration of the anticipated vehicular traffic for the site, the cap design specifications reflect the following criteria based on the design calculation:

- The sub grade, consisting of base and sub base layers of stabilized material blend, will have a minimum compressive strength of 50 psi and the base will have a minimum compressive strength of 500 psi.
- The RCC cap will be constructed in two lifts with full bonding condition;
- The RCC cap will have a minimum 28-day compressive strength of 4,000 psi; and
- The minimum finished RCC cap thickness will be 12 inches.

7.11.3 Roller-Compacted Concrete Cap Construction

Specification 02755A describes in detail all plant, material, and equipment necessary for construction of the RCC cap. Further, the specification describes all labor for the testing, manufacturing, transporting, placing, compacting, finishing, jointing, and curing of the RCC cap.

Required activities of the RCC cap construction include performance of an RCC cap test section, specification defined testing of RCC materials at the source and at various stages of handling on site, performance of a mixture proportioning study, site preparation, full-scale construction of the RCC cap, ongoing and subsequent testing of completed sections, and curing and protection of each completed section.

7.12 Site Restoration

Site restoration activities will include backfilling of excavations, re-vegetation, and removal of erosion measures and access roads.

7.12.1 Backfilling

Backfilling of excavations will be performed when the appropriate remedial goals are achieved. Backfilling activities will be staged to minimize impacts to the construction sequence. The excavations located within the on-base drainage channels will be backfilled with 6 inches of topsoil to establish final grades.

The excavation located in the off-base AOC will be backfilled with common fill to interim grades (i.e., 6 inches below final grades) and then with 6 inches of topsoil to establish final grades. The topsoil will consist of clean, medium-texture topsoil with organic matter content between 5 percent and 8 percent. The topsoil will be obtained from locations free of invasive plant species. The topsoil will be rolled, disked, and harrowed to create a seedbed. Small imperfections in the soils surface will be allowed to persist, thereby simulating irregular micro-topography inherent in most natural wetlands soils.

Backfilling will be performed in accordance with Specification 02315N, “Excavation and Fill”.

7.12.2 Revegetation

Following backfilling of excavation areas, the areas of disturbance will be restored. The on-base drainage channels will be vegetated using the specified permanent seed mixture. Figure 7-11 (RD Drawing C-12) provides extensive notes related to stabilization and revegetation actions. Figure 7-12 (RD Drawing C-26) provides revegetation details.

The off-base AOC (approximately 824,200 square feet) will be restored in situ. ECC will restore the wetlands by seeding with regionally indigenous wetland herbs. These areas will be simultaneously planted with regionally indigenous tree seedlings, which will progressively shade out the herbs and ultimately recreate forested wetland vegetation. Plastic tree guards will be installed around each of the seedlings at the time of planting to protect against browsing or other physical damage by wildlife. Restoration will be performed in accordance with Specification Section 02953, “Mitigated Wetland Area, Trees, Herbs, and Grasses”.

Within the limits of Site 8A, the rigid RCC cap will not require restoration; however, the drainage channels located within the footprint of the site will be restored using temporary erosion control matting and/or riprap and the specified permanent seed mixture. Figure 7-12 (RD Drawing C-26) illustrates channel restoration.

7.12.3 Removal of Temporary Structures

Silt fencing and other erosion features will be removed after a sufficient stand of grass has been established on disturbed areas. Any sediment deposits remaining after a silt fence is removed will be spread over the ground surface outside the limits of the landfill cap.

The aggregate used to construct temporary roads in the AOC will be removed and stockpiled on site for future use. The diversion channel will be regarded and culverts will be removed. The breach in the road’s base will remain and will continue to allow surface water flow.

ECC will remove all temporary haul roads, temporary construction entrances/exits, and wheel wash facilities at Site 8. Backfill and revegetation of temporary road areas will be conducted as described in 7.12.2.

7.12.4 Storm Water Retention

Due to the proposed changes in surface topography at Site 8A, the post-construction site conditions are expected to produce heavier storm water runoff. Due to the inclusion of oversized drainage channels within the limits of Site 8A during the landfill construction, the post construction runoff peak discharge only slightly exceeds the pre-construction runoff peaks. Therefore, other than the proposed drainage channels on site 8A, no permanent storm water features are required by the 100 % RD.

7.12.5 Site Maintenance

A site maintenance program will begin as soon as the remedial action is completed. The maintenance program will include:

- Temporary security fencing;
- Monitoring wells;
- Drainage swales; and
- Final cover system.

7.12.6 Land-Use Controls and Long-Term Monitoring

Land-use controls will be implemented to control or eliminate pathways of exposure to the contaminants of concern through the Land-Use Control Implementation Plan (LUCIP) and Land-Use Control Assurance Plan (LUCAP). Additionally, long-term monitoring of groundwater and sediment will be conducted and a re-evaluation of the Site will be performed every 5 years to determine whether changes to the land-use controls, monitoring, and/or remedial action are required. Routine operations and maintenance of the final cover system also will be performed. A separate Long-Term Monitoring Plan will be submitted by the Navy at a later date.

7.13 Demobilization

Demobilization consists of removing all personnel, equipment, and materials from the Site.

8.0 SUBMITTAL AND REPORTING REQUIREMENTS

ECC will prepare and maintain the site work reports as described in this Section and deliver them to NAVFAC.

8.1 Documentation Procedures

An on-site project file will be established in accordance with ECC Program QC policies and the contract. The project file will include a record copy of the following:

- Contract task order documentation,
- Project plans,
- Navy review comments and comment resolutions,
- Navy notice to proceed,
- Technical specifications, including addenda and modifications,
- Contract change orders and other contract modifications,
- Manufacturer's certificates,
- Safety and health compliance forms,
- Training certifications,
- Daily production sheets,
- Daily QC Report, and
- Incident/Accident Reports.

ECC will maintain the following three distinct forms of files for project documentation:

- Hard copy;
- Electronic copy; and
- Electronic backup discs.

A complete set of project files will be maintained in the site office trailer at the Site.

8.2 Reports

The following reports will be required for this project.

8.2.1 Quality Control Meeting Minutes

QC meeting minutes will be forwarded to the ROICC within 7 days of the meeting.

8.2.2 Contractor Production Report

ECC will produce a combined DQCR and Contractor Production Report (to be designated the Daily QC Report). Each DQCR will be prepared, signed, and dated by the QCM. A DQCR will include the following information:

- Date of report, report number, name of contractor, contract number, title and location of contract and task order, and superintendent present;
- Daily weather report, morning and afternoon, including maximum and minimum temperatures, and wind direction and speed;
- Work progress;
- An overview of QC activities performed each day, including those performed on subcontractor and supplier activities;
- Verbal instructions given by the government and associated actions by ECC;
- Field changes and variance;
- Safety inspections/deficiencies, lost time accidents, hazardous materials or waste released into the environment;
- Personnel, materials, equipment on the work site;
- Workforce job hours and cumulative hours;
- Conflicts or errors in the specifications;
- Corrective actions taken;
- Problems and/or delays encountered;
- A record of visitors to the work site; and
- Contract information.

The DQCR will present an accurate and complete description of QC activities. It will document both conforming and deficient conditions, and will be precise, factual, legible, and objective. Copies of the supporting documentation, such as checklists and surveillance reports, will be attached.

A field QC log will be assigned to the QCM for documenting details of field activities during QC monitoring activities. The information in the QC log is intended to serve as a memory aid in the preparation of the DQCR and in addressing follow-up questions that may arise.

The QCM is responsible for the preparation and submission of the DQCR to the ROICC with a copy to the PM. The original and one copy of the DQCR with attachments will be submitted to the ROICC on the following day, no later than 10:00 am, or at a time designated by the ROICC. All calendar days, including weekends and holidays, will be accounted for throughout this project.

DQCRs and QC logs used on this project are legally binding documents, subject to restrictions. Each DQCR will be assigned and tracked by a unique number comprised of the letters GP followed by the date expressed as YYMMDD (where GP = Gulfport, YY = year, MM = month, and DD = day). Copies of DQCRs with attachments and QC logs no longer in use will be maintained in the project QC file. Upon project closeout, all QC logs will be included in the project QC file.

8.2.3 Certified Test Report

Certified test reports will be attached to each DQCR as they are received. All certified test reports will be collated and included in the project closeout report.

8.2.4 Summary Report of Field Tests

A summary report of field tests will be prepared upon completion of each major activity. Field test summary reports will be submitted for the following activities:

- Soil/sediment excavating;
- Soil/sediment stabilization processing;
- RCC cap placement;
- Slope stabilization and erosion control;
- Backfill and/or compaction testing using ASTM D1557; and
- Site and wetlands restoration and monitoring.

The summary report of field tests will include an introduction, summary of tests and results, and copies of all certified test results.

8.3 Rework Items List

The Rework Items list will be attached to the last DQCR of the month, and will identify:

- Items to be reworked;
- Date originally discovered; and
- Date resolved.

8.4 As-Built Drawings

As-built drawings will be maintained on site. Design drawings will be marked in red indicating all variances from the design.

9.0 REFERENCES

- Environmental Chemical Corporation (ECC), 2004. Draft Bench-Scale Treatability Study Work Plan, Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, Charleston, South Carolina. June.
- Harding Lawson Associates (HLA), 2000. Remediation Planning Document, Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, Charleston, South Carolina. August.
- Tetra Tech NUS, Inc. (TtNUS), 2001. Report for Bench-Scale Soil/Sediment Treatability Study, Site 8, Herbicide Orange Study Area, Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. March.
- TtNUS, 2002. Excavation and Confirmation Sampling Report for the Edwards Property, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. March.
- TtNUS, 2003a. Focused Feasibility Study, Site 8, Herbicide Orange Storage Area at Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. March.
- TtNUS, 2003b. Verification Sampling and Analysis Plan for Site 8 – Herbicide Orange Study Area and Offbase Area of Contamination, Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. May.
- TtNUS, 2003c. Draft Site Characterization Report, Off-base Contamination, Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. April.
- TtNUS, 2004. 100% Remedial Design, Site 8, Herbicide Orange Storage Area and Off-base Area of Contamination, Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. October.
- Office of Pollution Control (OPC), 2000. Mississippi Stormwater Pollution Prevention Plan (SWPPP) Guidance Manual for Construction Activities. General Permits Branch, OPC, Department of Environmental Quality, March.
- United States Department of Agriculture (USDA), 1994. Planning and Design Manual for the Control of Erosion, Sediment, and Stormwater, First Edition. A cooperative effort by the United States Department of Agriculture Natural Resources Conservation Service, the Mississippi Department of Environmental Quality, and the Mississippi Soil and Water Conservation Commission, April.
- United States Environmental Protection Agency (EPA), 2001 Environmental Investigation Standard Operating Procedures and Quality Assurance Manual (EISOPQAM).

FIGURES

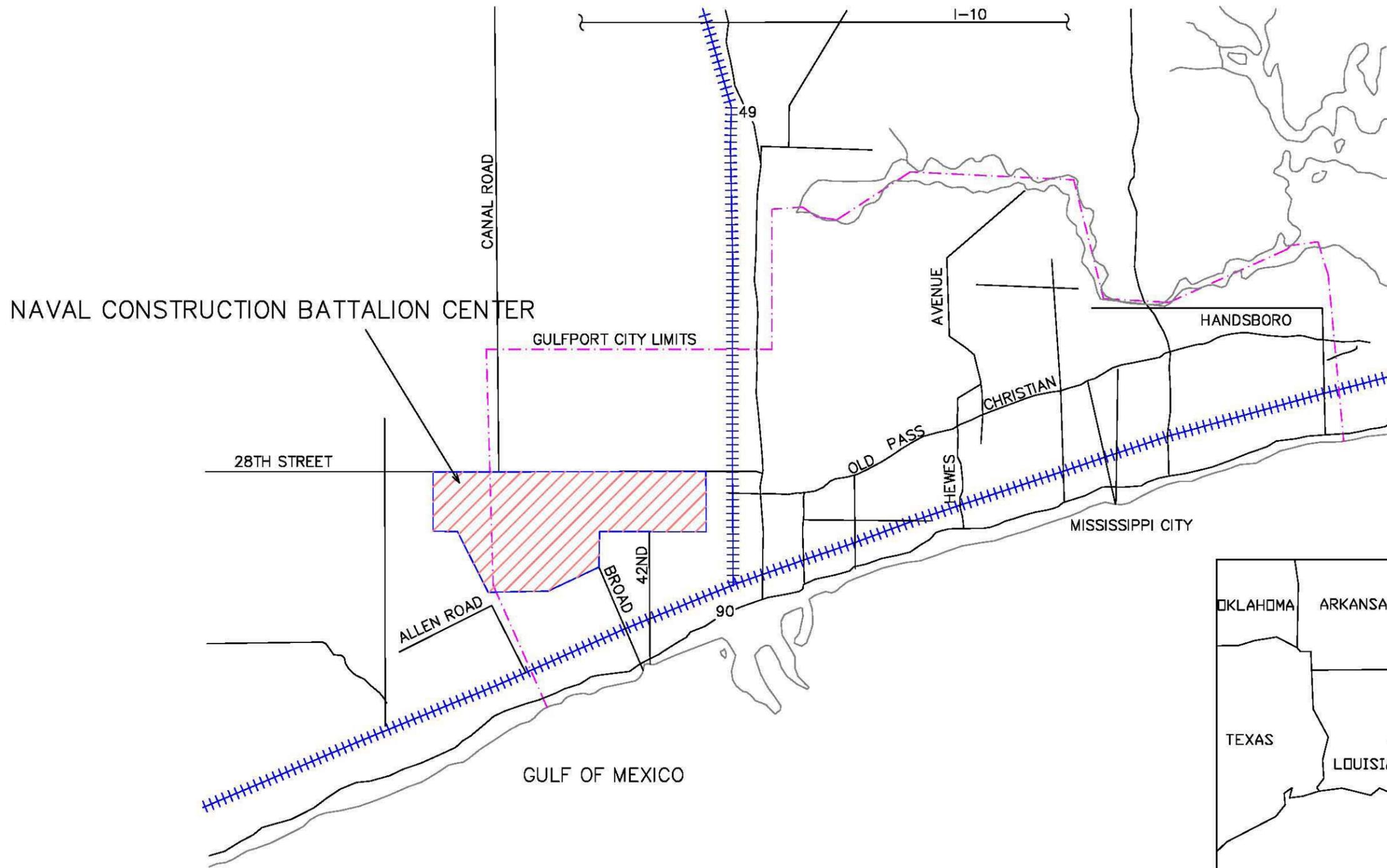
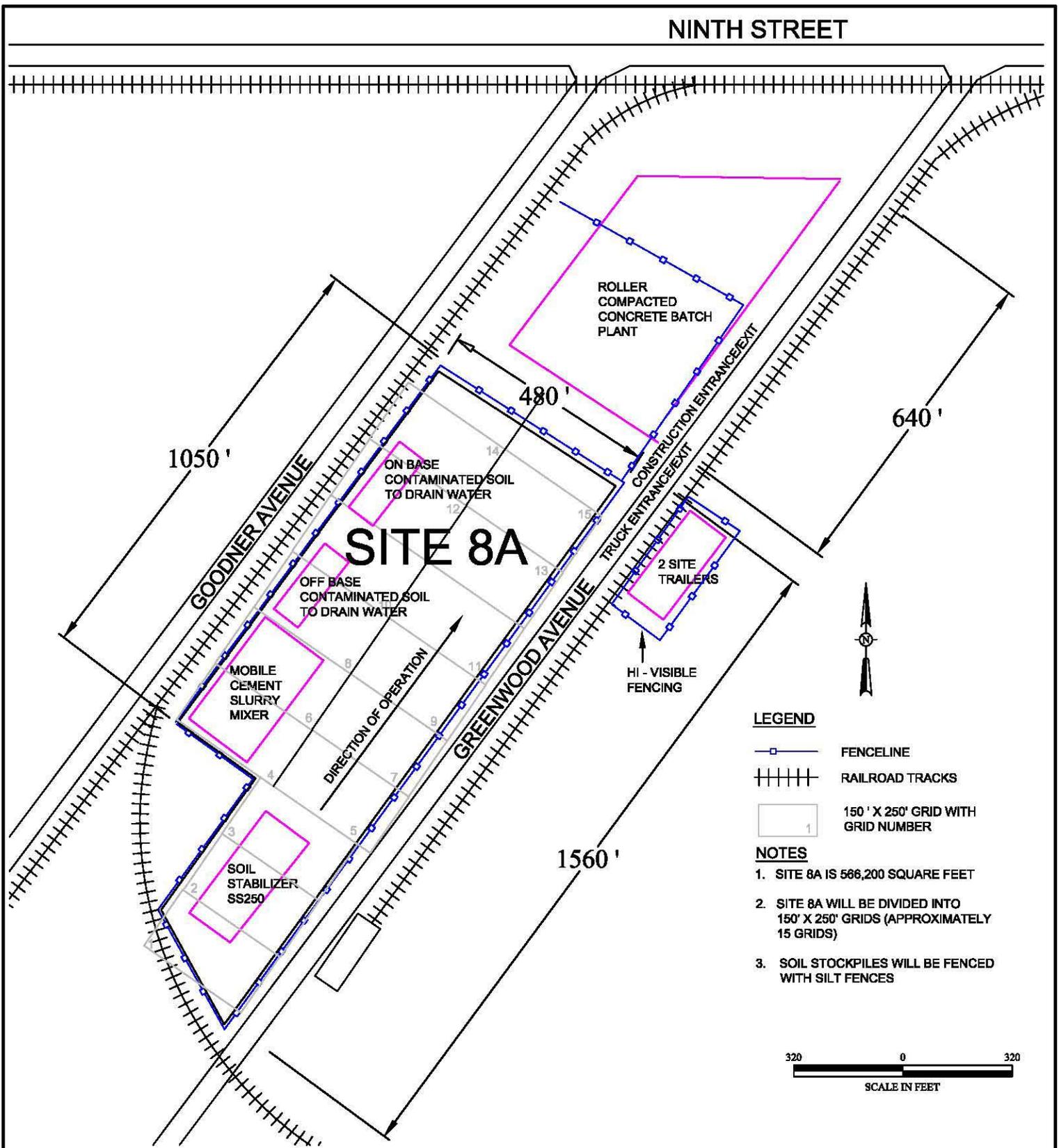


FIGURE 1-1
 SITE LOCATION MAP
 NAVAL CONSTRUCTION
 BATTALION CENTER
 GULFPORT, MISSISSIPPI



LEGEND

- FENCELINE
- RAILROAD TRACKS
- 150' X 250' GRID WITH GRID NUMBER

NOTES

1. SITE 8A IS 566,200 SQUARE FEET
2. SITE 8A WILL BE DIVIDED INTO 150' X 250' GRIDS (APPROXIMATELY 15 GRIDS)
3. SOIL STOCKPILES WILL BE FENCED WITH SILT FENCES



ENVIRONMENTAL CHEMICAL CORPORATION
 1240 BAYSHORE HIGHWAY
 BURLINGAME, CA 94010

DRAWN BY:
DRE

APPROVED BY:

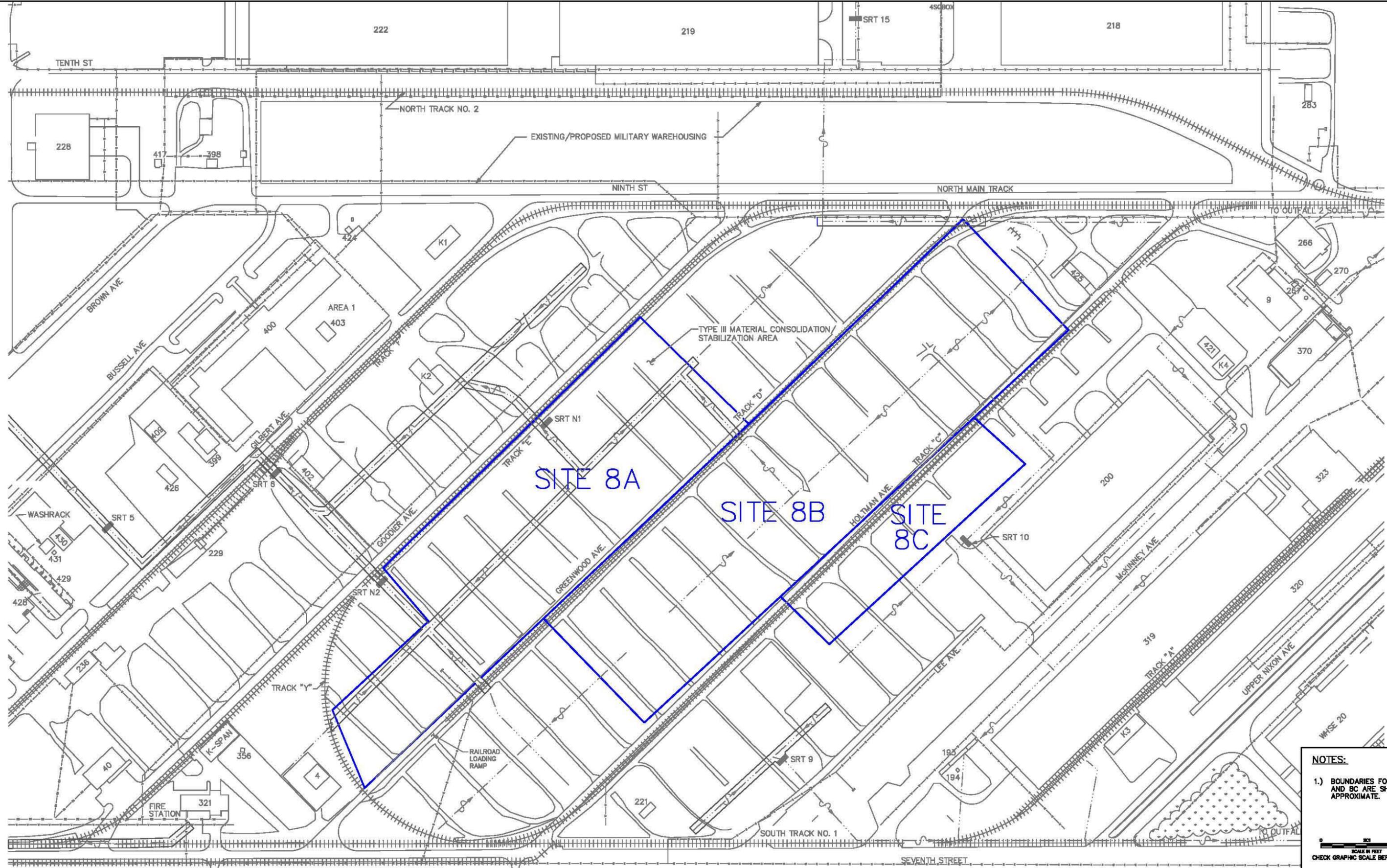
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3-AUG-04

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FIGURE 1-3 - SITE 8A LAYOUT

SITE 8A REMEDIAL ACTION
 NAVAL CONSTRUCTION BATTALION CENTER
 GULFPORT, MISSISSIPPI

PROJECT CODE:		CONTRACT CODE:	
SCALE: NTS	FILENAME: Figure 2 - Site 8A Layout.dwg	SHEET: 1 OF 1	REV: 1



SITE 8A

SITE 8B

SITE 8C

NOTES:
 1.) BOUNDARIES FOR SITES 8B AND 8C ARE SHOWN APPROXIMATE.

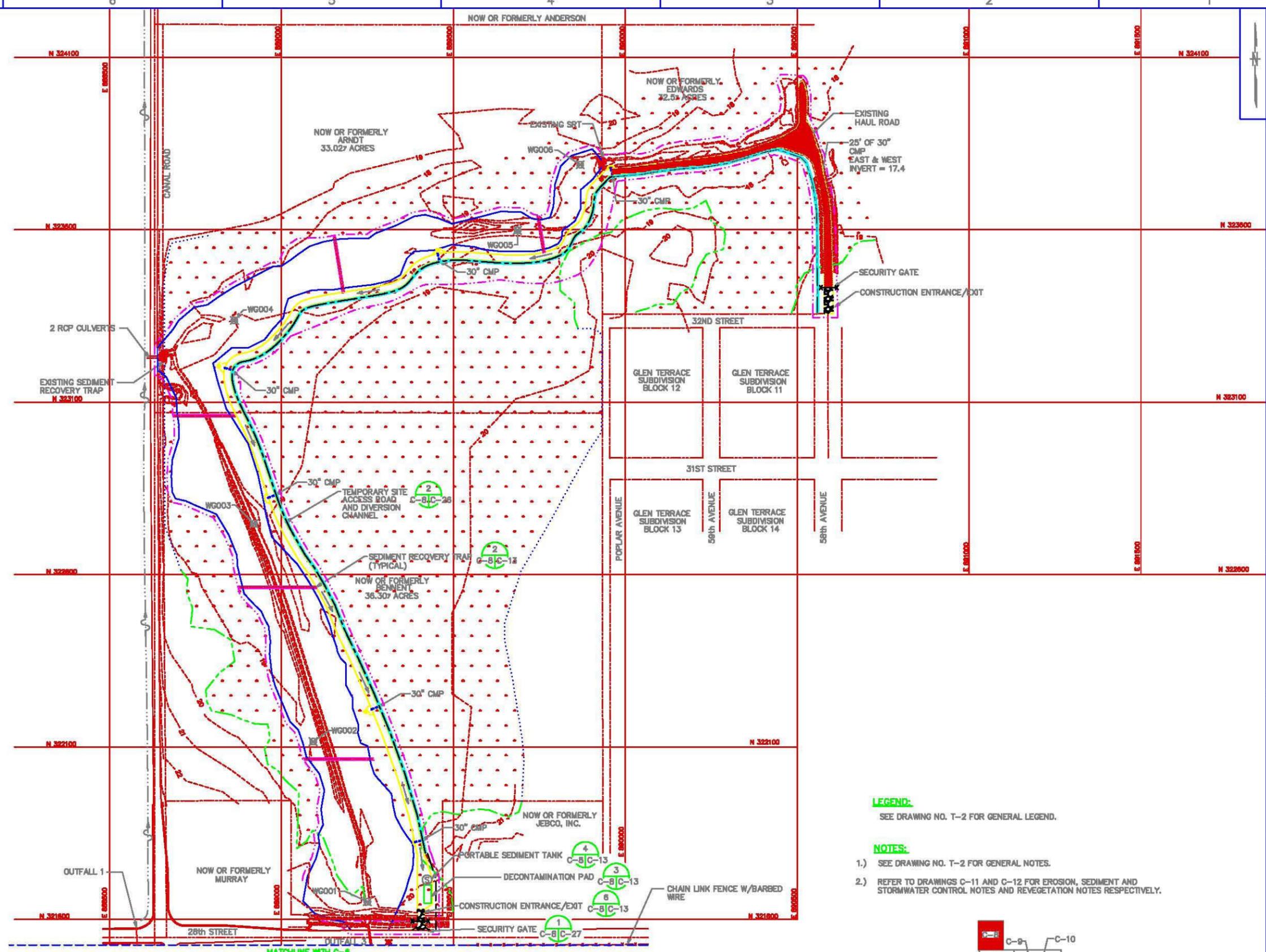
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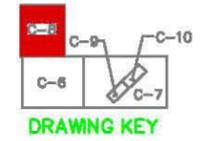
FIGURE 1-2 - SITE LAYOUT PLAN
 SITES 8A, 8B, AND 8C
 HERBICIDE ORANGE STORAGE AREA
 NAVAL CONSTRUCTION BATTALION CENTER
 GULFPORT, MISSISSIPPI

CONTRACT NO.	
NAVFAC NO.	
APPROVED BY	DATE
DRAWING NO.	REV. 0



LEGEND:
SEE DRAWING NO. T-2 FOR GENERAL LEGEND.

- NOTES:**
- 1.) SEE DRAWING NO. T-2 FOR GENERAL NOTES.
 - 2.) REFER TO DRAWINGS C-11 AND C-12 FOR EROSION, SEDIMENT AND STORMWATER CONTROL NOTES AND REVEGETATION NOTES RESPECTIVELY.

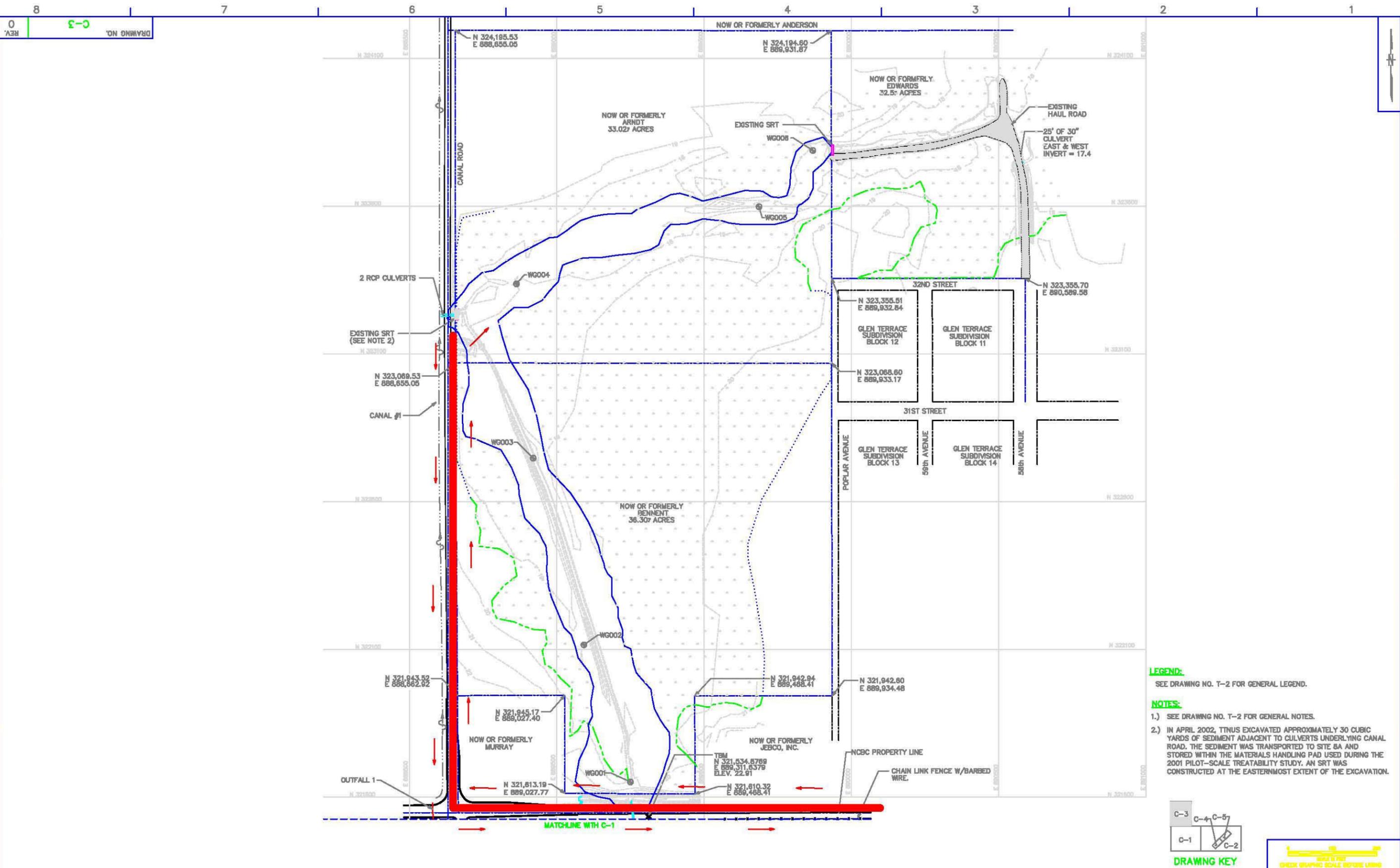


NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY: DM DATE: 6/29/04
 CHECKED BY: TWS DATE:
 REVISED BY: DATE:
 SCALE: AS NOTED

FIGURE 7-1
AOC ACCESS ROADS AND DIVERSION CHANNELS
100% REMEDIAL DESIGN
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

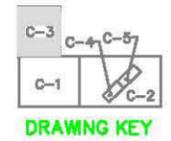
CONTRACT NO. 7379
 NAVFAC NO. 5424671
 APPROVED BY: DATE:
 DRAWING NO. C-8 REV. 0



LEGEND:
SEE DRAWING NO. T-2 FOR GENERAL LEGEND.

NOTES:

- SEE DRAWING NO. T-2 FOR GENERAL NOTES.
- IN APRIL 2002, TTNUS EXCAVATED APPROXIMATELY 30 CUBIC YARDS OF SEDIMENT ADJACENT TO CULVERTS UNDERLYING CANAL ROAD. THE SEDIMENT WAS TRANSPORTED TO SITE 8A AND STORED WITHIN THE MATERIALS HANDLING PAD USED DURING THE 2001 PILOT-SCALE TREATABILITY STUDY. AN SRT WAS CONSTRUCTED AT THE EASTERNMOST EXTENT OF THE EXCAVATION.



NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

SEAL AREA

DRAWN BY: DM DATE: 6/28/04

CHECKED BY: TWS DATE: _____

REVISED BY: _____ DATE: _____

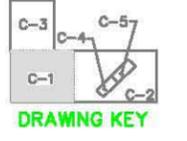
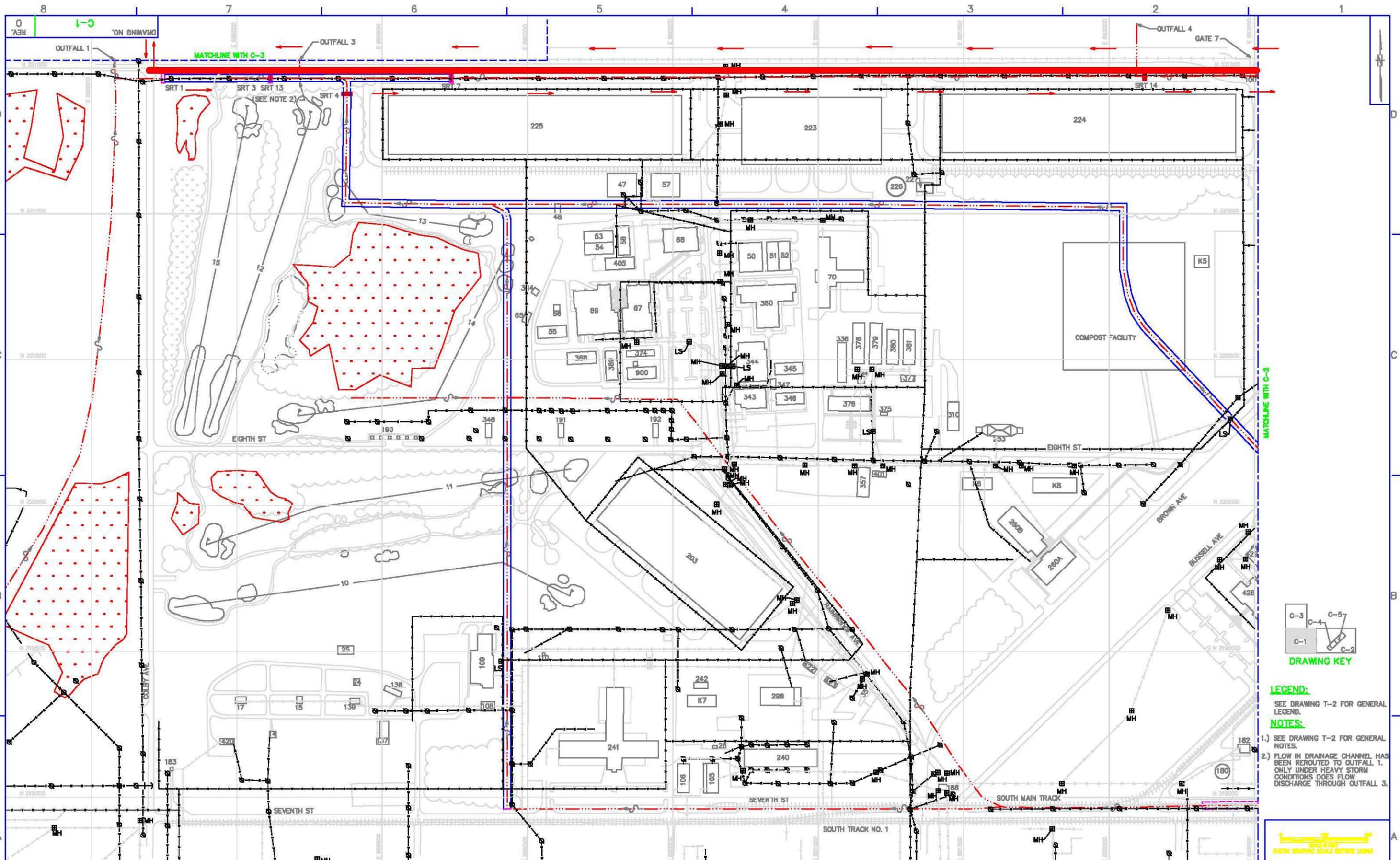
SCALE: AS NOTED

FIGURE 7-2
SITE 8 HAUL ROAD AND CONSTRUCTION ENTRANCES
MAP A

100% REMEDIAL DESIGN
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

CONTRACT NO. 7379
NAVFAC NO. 5424666
APPROVED BY: _____ DATE: _____
DRAWING NO. C-3 REV. 0

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LEGEND:
SEE DRAWING T-2 FOR GENERAL LEGEND.

- NOTES:**
- SEE DRAWING T-2 FOR GENERAL NOTES.
 - FLOW IN DRAINAGE CHANNEL HAS BEEN ROUTED TO OUTFALL 1. ONLY UNDER HEAVY STORM CONDITIONS DOES FLOW DISCHARGE THROUGH OUTFALL 3.

SCALE: 1" = 100'
CHECK GRAPHIC SCALE BEFORE USING

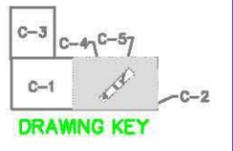
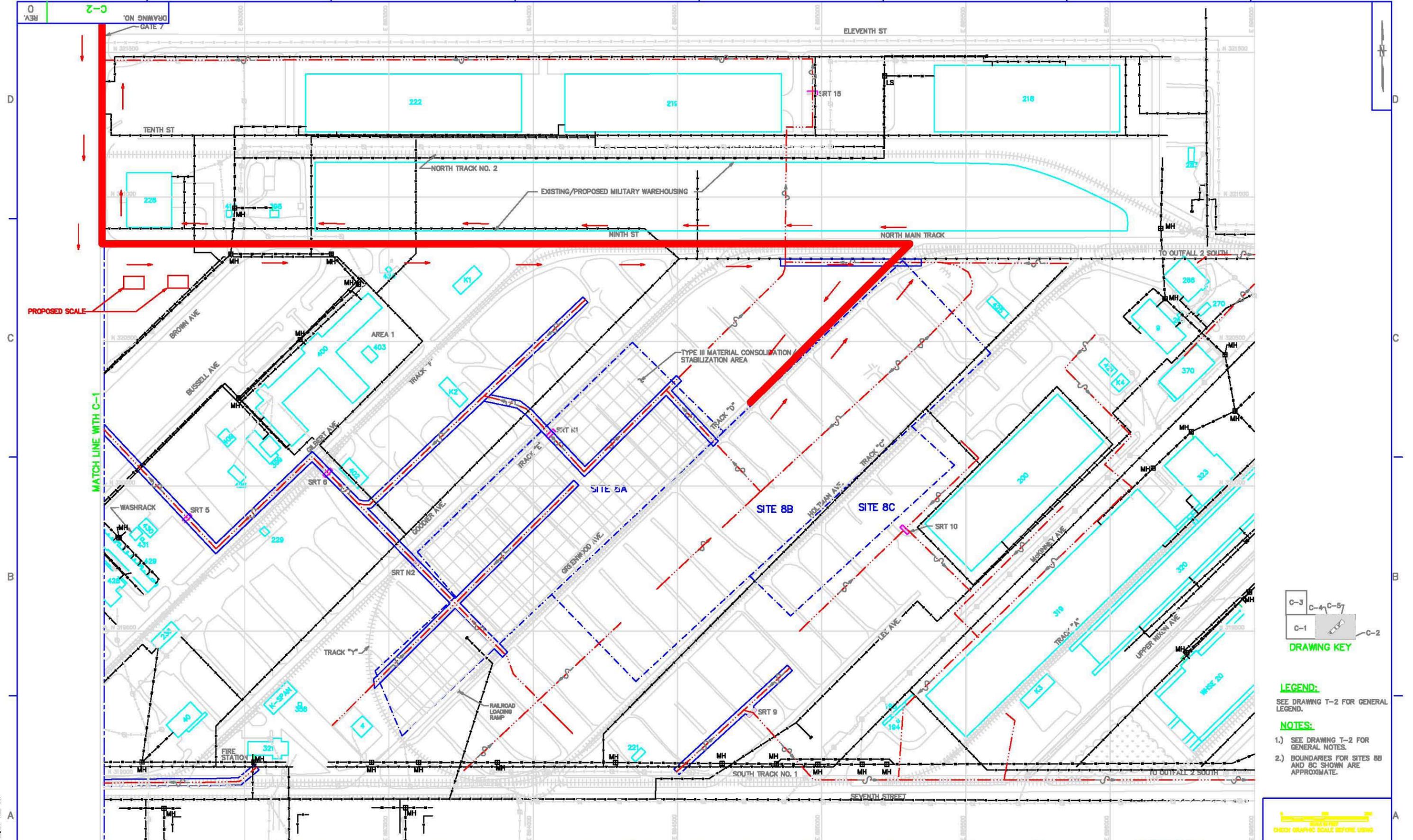
NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY	DM	DATE	8/28/04
CHECKED BY	TWS	DATE	
REVISED BY		DATE	
SCALE	AS SHOWN		

FIGURE 7-2b
SITE B HAUL ROAD AND CONSTRUCTION ENTRANCES
MAP B
100% REMEDIAL DESIGN
SITE B - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

CONTRACT NO.	7379
NAVFAC NO.	5424664
APPROVED BY	DATE
DRAWING NO.	C-1
REV.	0

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- LEGEND:**
SEE DRAWING T-2 FOR GENERAL LEGEND.
- NOTES:**
1.) SEE DRAWING T-2 FOR GENERAL NOTES.
2.) BOUNDARIES FOR SITES 8B AND 8C SHOWN ARE APPROXIMATE.



NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

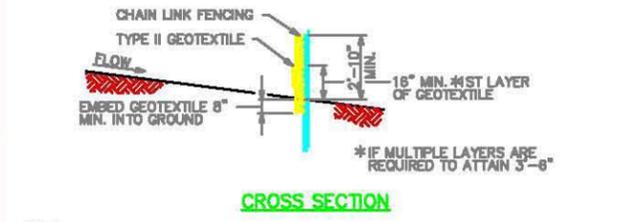
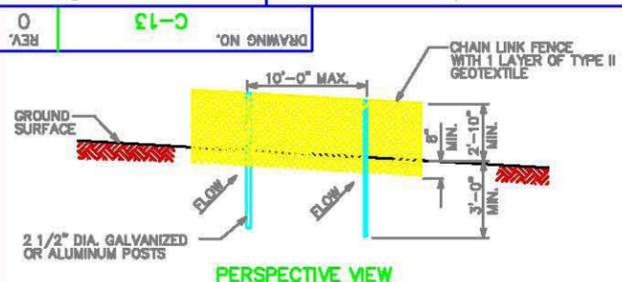
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REVIEWED BY		DATE	
SCALE	AS SHOWN		

FIGURE 7-2c
SITE 8 HAUL ROAD AND CONSTRUCTION ENTRANCES
MAP C
100% REMEDIAL DESIGN
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

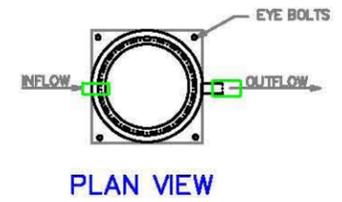
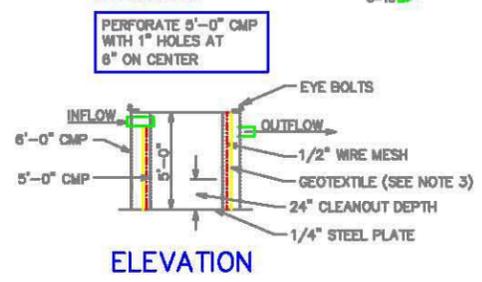
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REV.	0

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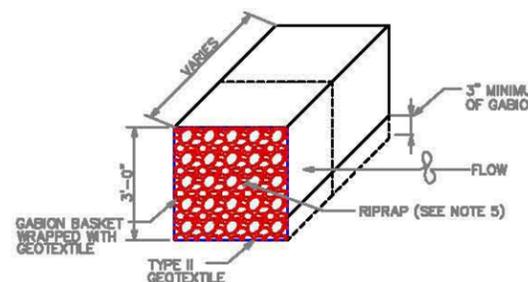
- NOTES:**
1. WHEN GEOTEXTILE SECTIONS ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED 6" AND FOLDED.
 2. FENCING SHALL BE 42" (MIN.) IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MISSISSIPPI STATE HIGHWAY DETAILS FOR CHAIN LINK FENCING.
 3. CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES. THE LOWER TENSION WIRE, BRACE AND TRUSS RODS, DRIVE ANCHORS, AND POST CAPS ARE NOT REQUIRED EXCEPT ON THE ENDS OF THE FENCE.
 4. GEOTEXTILE SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED 24" AT THE TOP AND MID-SECTION AND SHALL MEET THE REQUIREMENTS OF TYPE II GEOTEXTILE.
 5. CONTRACTOR IS TO EMBED SUPER SILT FENCE POSTS SUCH THAT A MAXIMUM HORIZONTAL DEFLECTION OF 1" RESULTS (MEASURED AT A HEIGHT OF 33" ABOVE GRADE) WHEN 5 POUNDS OF HORIZONTAL FORCE IS APPLIED AT THE POINT WHERE DEFLECTION IS MEASURED.
 6. SEDIMENT SHALL BE REMOVED FROM THE CONTROL DEVICE WHEN THE SEDIMENT REACHES 1/3 TO 1/2 THE HEIGHT OF THE CONTROL DEVICE.

SUPER SILT FENCE DETAIL
NOT TO SCALE

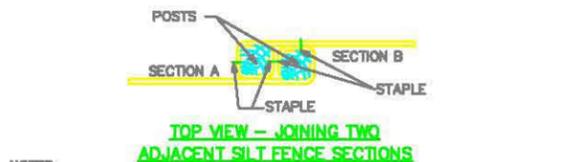
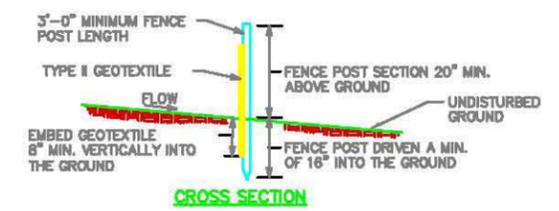
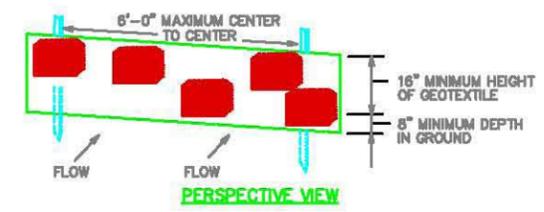


- NOTES:**
1. AN EXAMPLE OF A TYPICAL SEDIMENT TANK IS SHOWN. OTHER CONTAINER DESIGNS CAN BE USED IF THE STORAGE VOLUME IS ADEQUATE AND APPROVAL IS OBTAINED FROM THE ROICC.
 2. PORTABLE SEDIMENT TANKS SHALL BE PLACED IN SERIES IF ADDITIONAL RETENTION TIME OR CAPACITY IS REQUIRED. ONE CUBIC FOOT OF STORAGE SHALL BE PROVIDED FOR EACH GALLON PER MINUTE OF PUMP DISCHARGE CAPACITY.
 3. GEOTEXTILE MESH SIZE MAY VARY FROM TANK TO TANK IF TANKS ARE INSTALLED IN SERIES. ALL GEOTEXTILES SHALL HAVE AOS LESS THAN 0.3 MM, PERMEABILITY GREATER THAN 0.01 CM/SEC, GRAB TENSILE GREATER THAN 90 LBS AND BURST STRENGTH GREATER THAN 145 PSI. THE DOWNSTREAM-MOST GEOTEXTILE SHALL HAVE BURST STRENGTH GREATER THAN 320 PSI.
 4. DISCHARGE FROM PORTABLE SEDIMENT TANKS SHALL BE CONTROLLED TO PROTECT DOWNSLOPE AREAS FROM EROSION. EROSION CONTROLS (E.G. EROSION CONTROL MATTING, RIPRAP, ETC.) SHALL BE SUBJECT TO ROICC APPROVAL.

PORTABLE SEDIMENT TANK DETAIL
NOT TO SCALE

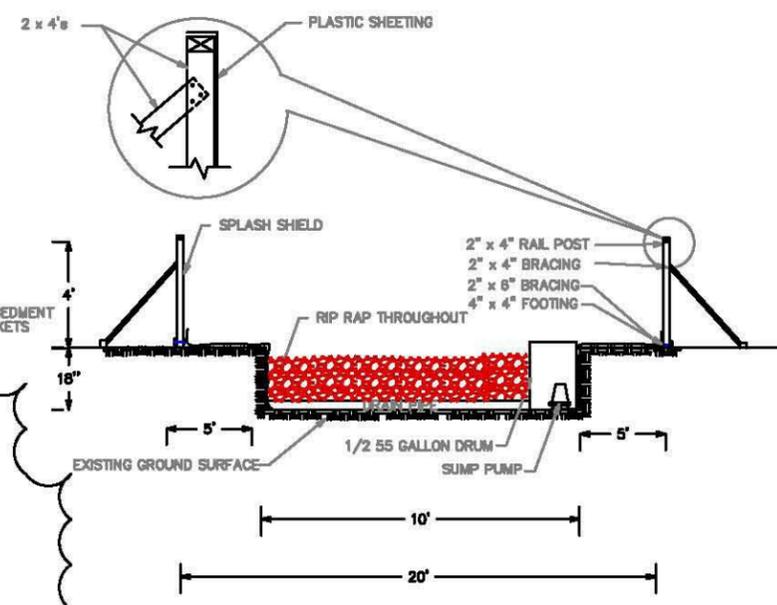


- NOTES:**
1. THE LENGTH OF EACH SRT WILL VARY DEPENDING ON THE LOCATION.
 2. SRT SIZES CAN BE INCREASED BY STACKING GABION BASKETS.
 3. GEOTEXTILES SHOULD BE OVERLAPPED A MINIMUM OF 6 INCHES.
 4. OVERLAP FREE ENDS OF GEOTEXTILE A MINIMUM OF 1'. FASTEN TO GABION BASKET WITH TIES.
 5. STONE USED FOR RIPRAP SHALL BE #50 @ SIZE OF 6" APPROXIMATELY EQUAL TO THE 200 POUND STONE IDENTIFIED IN SECTION 705 OF THE MISSISSIPPI STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

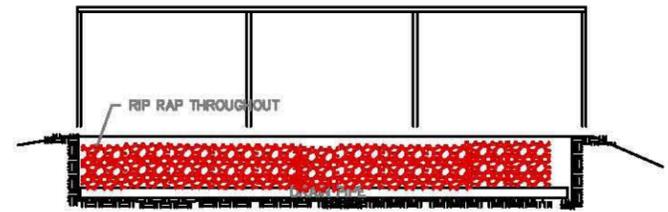


- NOTES:**
1. FENCE POSTS SHALL BE A MINIMUM OF 3'-0" LONG DRIVEN 16" MINIMUM INTO THE GROUND. WOOD POSTS SHALL BE 1.5" BY 1.5" SQUARE (MIN) CUT OR 1.75" DIA. (MIN) ROUND AND SHALL BE OF SOUND HARDWOOD. STEEL POSTS WILL BE STANDARD T OR U SECTION WEIGHING NOT LESS THAN 1 POUND PER LINEAR FOOT.
 2. GEOTEXTILE SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID-SECTION AND SHALL MEET THE REQUIREMENTS OF TYPE II GEOTEXTILE.
 3. SEDIMENT SHALL BE REMOVED FROM THE CONTROL DEVICE WHEN THE SEDIMENT REACHES 1/3 TO 1/2 THE HEIGHT OF THE CONTROL DEVICE.

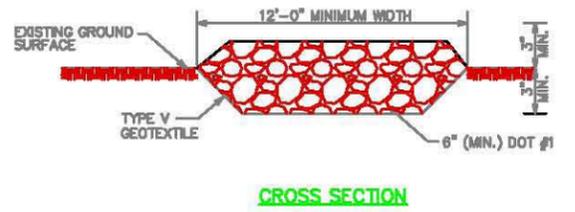
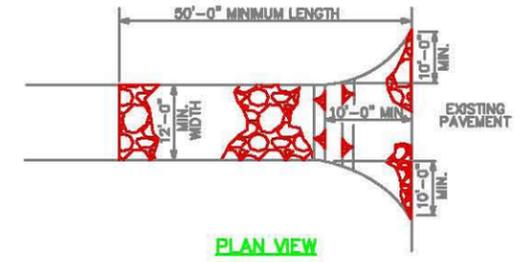
SILT FENCE DETAIL
NOT TO SCALE



- NOTES:**
1. ON/OFF OPERATION OF PUMP IS CONTROLLED BY FLOAT SO THAT PUMP STARTS WHEN SUMP WATER LEVEL REACHES 4" BELOW SUMP INLET AND SHUTS OFF WHEN WATER LEVEL DROPS TO PUMP DISCHARGE LEVEL.
 2. DRAIN COUPLING IS TO BE FITTED WITH QUICK DISCONNECT AND 3" DIA. SCH 80 PVC (INNER COUPLING) OR 3" DIA. RUBBER DISCHARGE HOSE (OUTER COUPLING) TO SUMP. THE OUTER DRAIN COUPLING IS TO BE USED ONLY AFTER VEHICLE HAS LEFT THE PAD. PLUG ALL DRAINS NOT BEING USED.



DECONTAMINATION PAD DETAIL (TYP.)
NOT TO SCALE



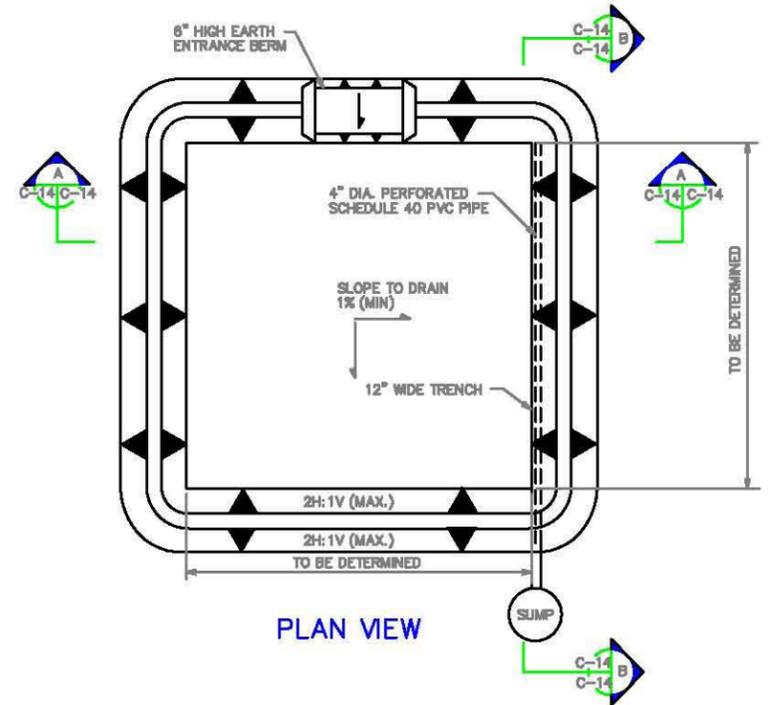
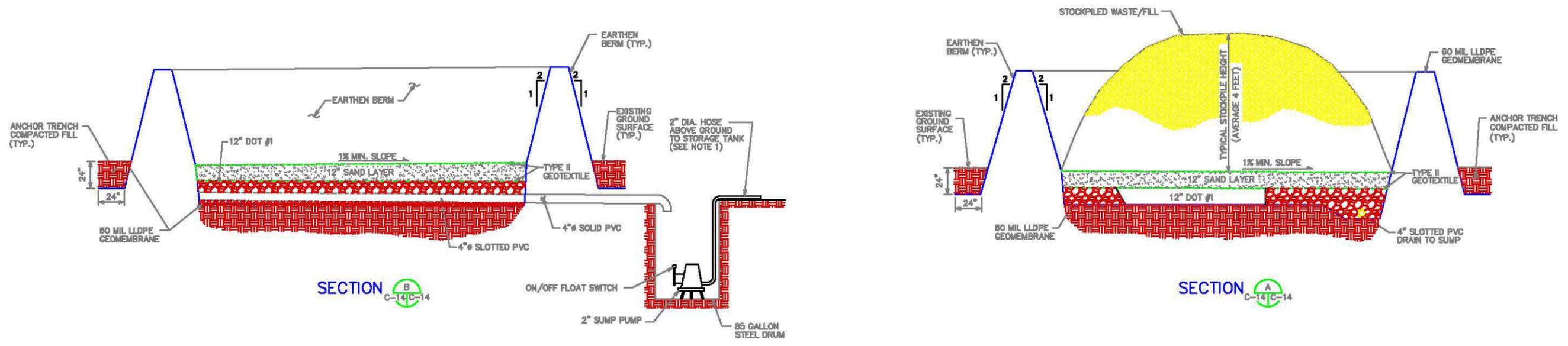
CONSTRUCTION ENTRANCE/EXIT DETAIL
NOT TO SCALE

NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY	DM	DATE	8/28/04
CHECKED BY	TWS	DATE	
REVISD BY		DATE	
SCALE	AS SHOWN		

FIGURE 7-3
DECONTAMINATION PAD DETAILS
100% REMEDIAL DESIGN
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

CONTRACT NO.	7379
NAVFAC NO.	5424676
APPROVED BY	
DATE	
DRAWING NO.	C-13
REV.	0



MATERIAL HANDLING PAD
NOT TO SCALE

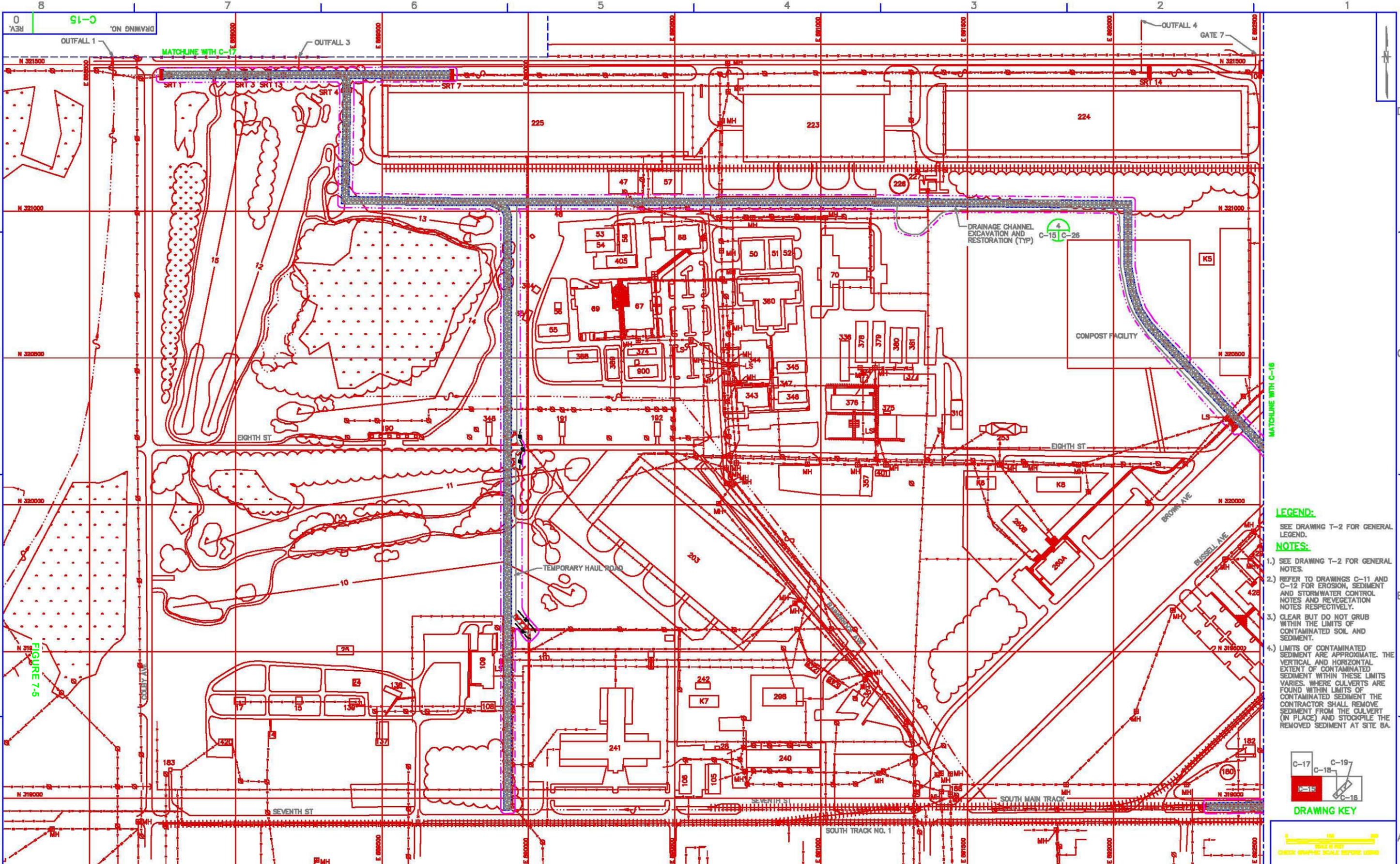
NOTES: PRIOR TO DISCHARGE OR OFFSITE TREATMENT/DISPOSAL OF COLLECTED WATER, REMOVE SEDIMENT. SEDIMENT REMOVED FROM COLLECTED WATER SHALL BE ADDED TO THE MATERIAL BLEND.

NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

SEAL AREA	DRAWN BY DM	DATE 6/29/04
	CHECKED BY TWS	DATE
	REVISED BY	DATE
	SCALE AS SHOWN	

FIGURE 7-4 MATERIAL HANDLING PAD DETAILS 100% REMEDIAL DESIGN SITE 8 - HERBICIDE ORANGE STORAGE AREA NAVAL CONSTRUCTION BATTALION CENTER GULFPORT, MISSISSIPPI		CONTRACT NO. 7379 NAVFAC NO. 5424677 APPROVED BY _____ DATE _____ DRAWING NO. C-14 REV. 0
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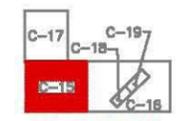
ACAD:73790205.dwg 06/29/04 WF RT



LEGEND:
SEE DRAWING T-2 FOR GENERAL LEGEND.

NOTES:

- 1.) SEE DRAWING T-2 FOR GENERAL NOTES.
- 2.) REFER TO DRAWINGS C-11 AND C-12 FOR EROSION, SEDIMENT AND STORMWATER CONTROL NOTES AND REVEGETATION NOTES RESPECTIVELY.
- 3.) CLEAR BUT DO NOT GRUB WITHIN THE LIMITS OF CONTAMINATED SOIL AND SEDIMENT.
- 4.) LIMITS OF CONTAMINATED SEDIMENT ARE APPROXIMATE. THE VERTICAL AND HORIZONTAL EXTENT OF CONTAMINATED SEDIMENT WITHIN THESE LIMITS VARIES. WHERE CULVERTS ARE FOUND WITHIN LIMITS OF CONTAMINATED SEDIMENT THE CONTRACTOR SHALL REMOVE SEDIMENT FROM THE CULVERT (IN PLACE) AND STOCKPILE THE REMOVED SEDIMENT AT SITE 8A.



DRAWING KEY

SCALE 1" = 50'
CHECK GRAPHIC SCALE BEFORE USING

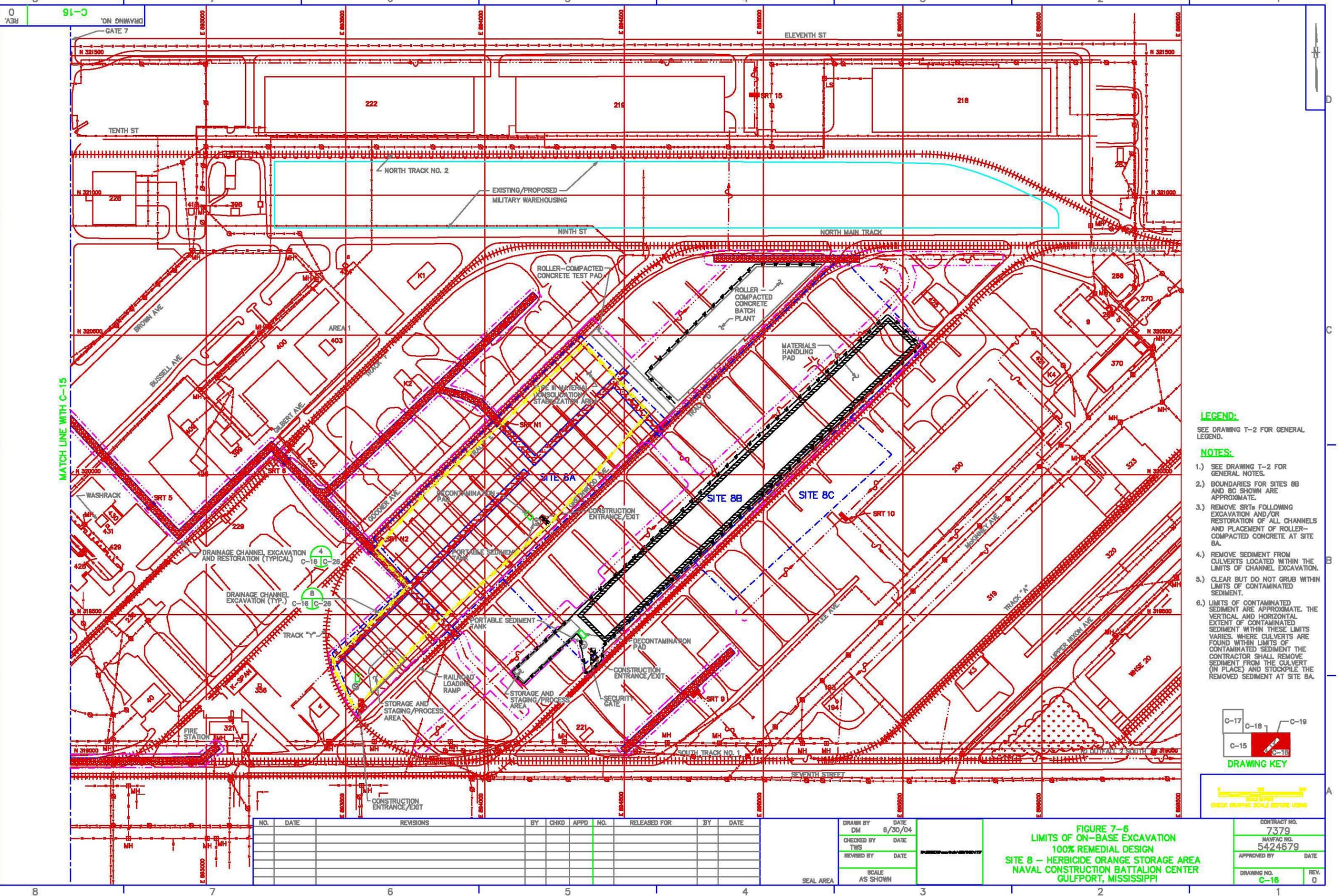
NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY: DM
DATE: 8/30/04
CHECKED BY: TWS
DATE:
REVISED BY:
DATE:
SCALE: AS SHOWN

**FIGURE 7-2
LIMITS OF ON-BASE EXCAVATION
100% REMEDIAL DESIGN
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI**

CONTRACT NO. 7379
NAVFAC NO. 5424678
APPROVED BY:
DATE:
DRAWING NO. C-15
REV. 0

ACAD: 7/27/04 11:33 AM

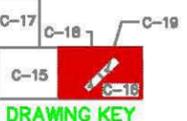


LEGEND:

SEE DRAWING T-2 FOR GENERAL LEGEND.

NOTES:

- 1.) SEE DRAWING T-2 FOR GENERAL NOTES.
- 2.) BOUNDARIES FOR SITES 8B AND 8C SHOWN ARE APPROXIMATE.
- 3.) REMOVE SRTs FOLLOWING EXCAVATION AND/OR RESTORATION OF ALL CHANNELS AND PLACEMENT OF ROLLER-COMPACTED CONCRETE AT SITE 8A.
- 4.) REMOVE SEDIMENT FROM CULVERTS LOCATED WITHIN THE LIMITS OF CHANNEL EXCAVATION.
- 5.) CLEAR BUT DO NOT GRUB WITHIN LIMITS OF CONTAMINATED SEDIMENT.
- 6.) LIMITS OF CONTAMINATED SEDIMENT ARE APPROXIMATE. THE VERTICAL AND HORIZONTAL EXTENT OF CONTAMINATED SEDIMENT WITHIN THESE LIMITS VARIES. WHERE CULVERTS ARE FOUND WITHIN LIMITS OF CONTAMINATED SEDIMENT THE CONTRACTOR SHALL REMOVE SEDIMENT FROM THE CULVERT (IN PLACE) AND STOCKPILE THE REMOVED SEDIMENT AT SITE 8A.



DRAWING KEY

SCALE: AS SHOWN
CHECK GRAPHIC SCALE BEFORE USING

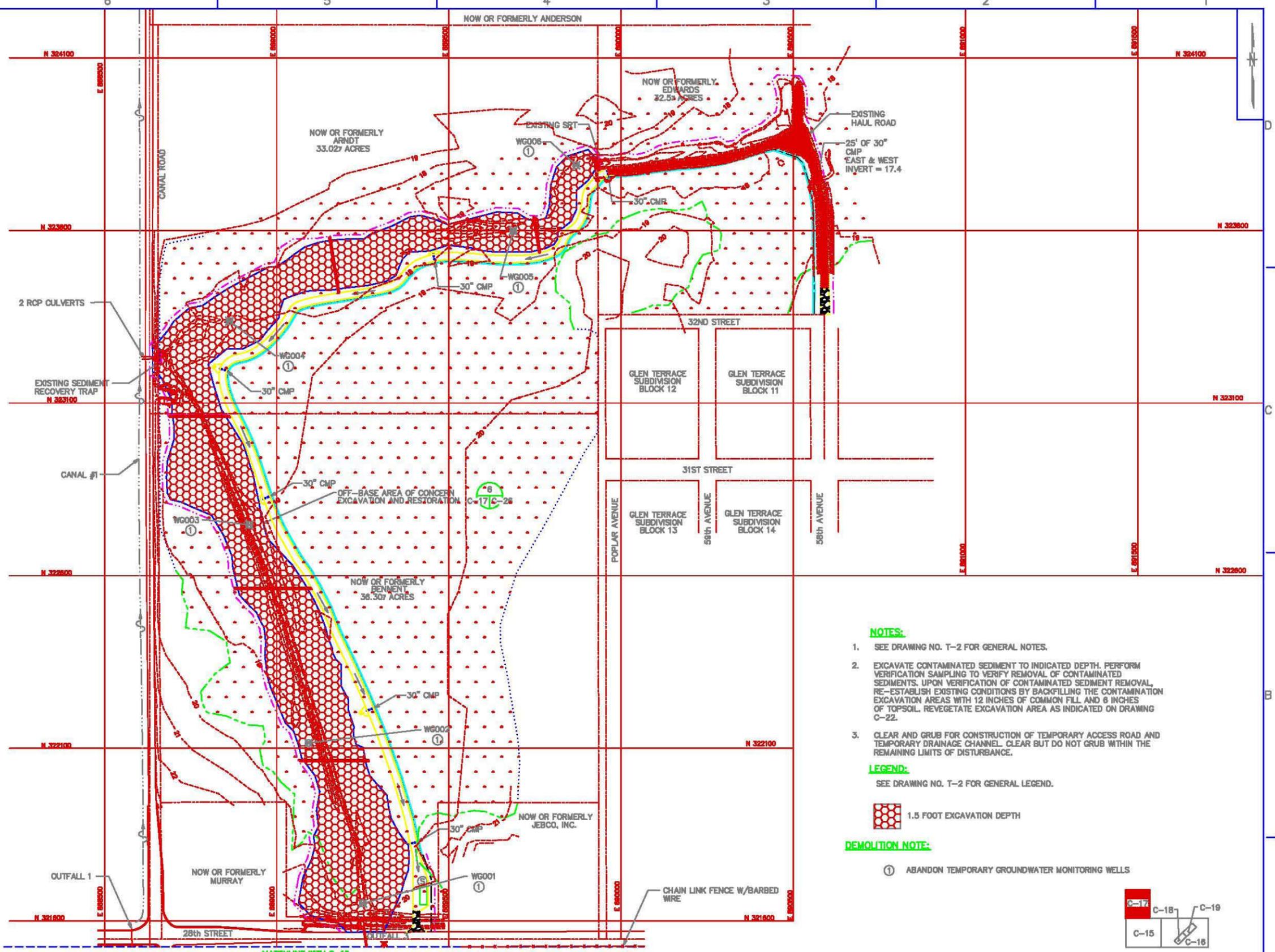
NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY	DM	DATE	8/30/04
CHECKED BY	TWS	DATE	
REVISED BY		DATE	
SCALE	AS SHOWN		

FIGURE 7-6
LIMITS OF ON-BASE EXCAVATION
100% REMEDIAL DESIGN
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

CONTRACT NO.	7379
NAVFAC NO.	5424679
APPROVED BY	
DATE	
DRAWING NO.	C-16
REV.	D

ACAD: 2/28/04.dwg 10/04/04 DM FT

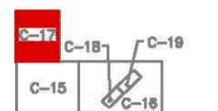


- NOTES:**
- SEE DRAWING NO. T-2 FOR GENERAL NOTES.
 - EXCAVATE CONTAMINATED SEDIMENT TO INDICATED DEPTH. PERFORM VERIFICATION SAMPLING TO VERIFY REMOVAL OF CONTAMINATED SEDIMENTS. UPON VERIFICATION OF CONTAMINATED SEDIMENT REMOVAL, RE-ESTABLISH EXISTING CONDITIONS BY BACKFILLING THE CONTAMINATION EXCAVATION AREAS WITH 12 INCHES OF COMMON FILL AND 6 INCHES OF TOPSOIL. REVEGETATE EXCAVATION AREA AS INDICATED ON DRAWING C-22.
 - CLEAR AND GRUB FOR CONSTRUCTION OF TEMPORARY ACCESS ROAD AND TEMPORARY DRAINAGE CHANNEL. CLEAR BUT DO NOT GRUB WITHIN THE REMAINING LIMITS OF DISTURBANCE.
- LEGEND:**
- SEE DRAWING NO. T-2 FOR GENERAL LEGEND.

1.5 FOOT EXCAVATION DEPTH

DEMOLITION NOTE:

① ABANDON TEMPORARY GROUNDWATER MONITORING WELLS



DRAWING KEY

SCALE IN FEET
CHECK GRAPHIC SCALE BEFORE USING

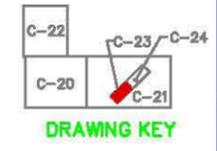
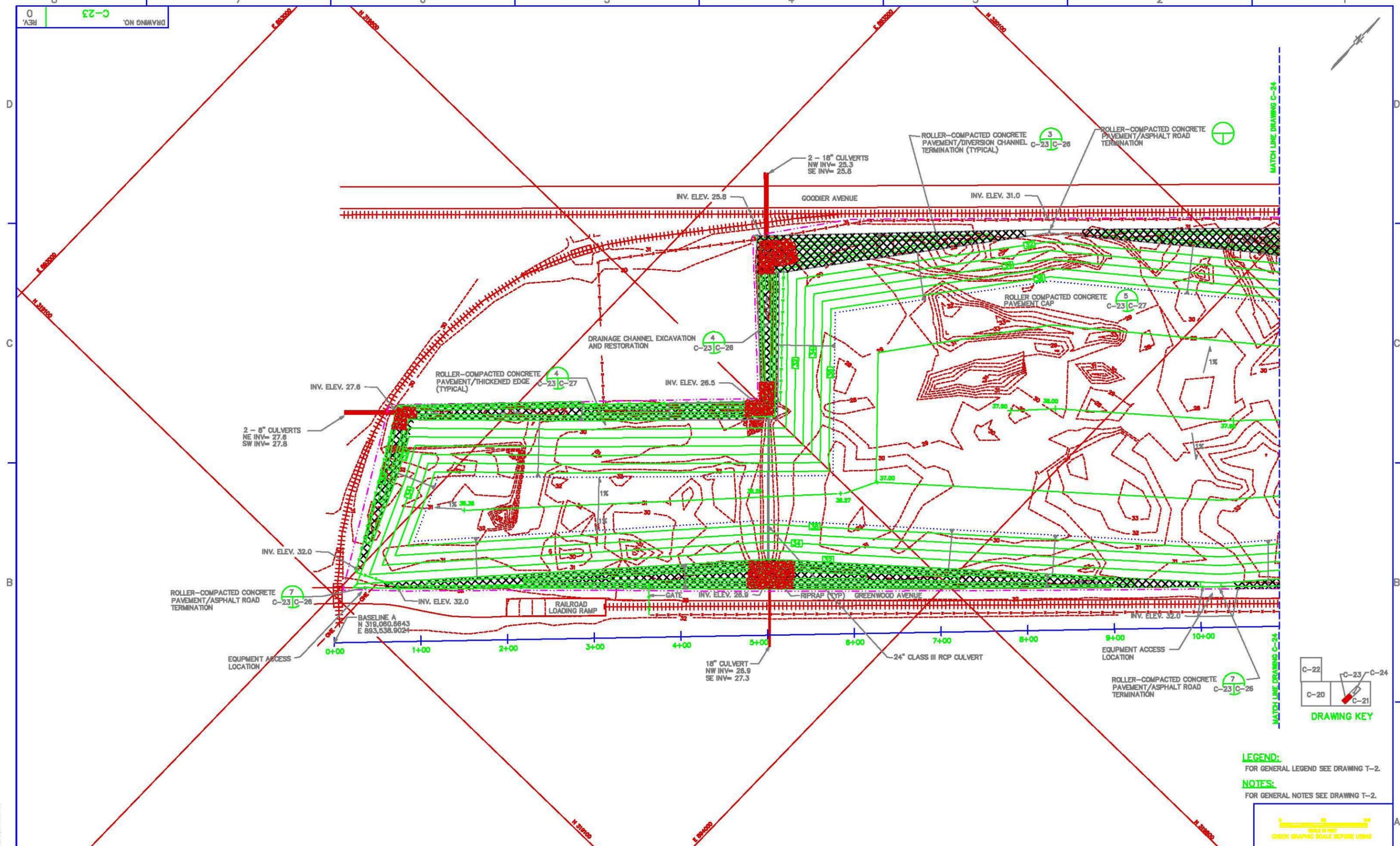
NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY: DM DATE: 6/30/04
 CHECKED BY: TWS DATE:
 REVISIONS BY: DATE:
 SCALE: AS NOTED

**FIGURE 7-7
 LIMITS OF OFF-BASE EXCAVATION
 100% REMEDIAL DESIGN
 SITE 8 - HERBICIDE ORANGE STORAGE AREA
 NAVAL CONSTRUCTION BATTALION CENTER
 GULFPORT, MISSISSIPPI**

CONTRACT NO. 7379
 NAVFAC NO. 5424680
 APPROVED BY: DATE:
 DRAWING NO. C-17 REV. D

A:\MS\2004\06\10\10\04\DM.PLT



LEGEND:
FOR GENERAL LEGEND SEE DRAWING T-2.

NOTES:
FOR GENERAL NOTES SEE DRAWING T-2.

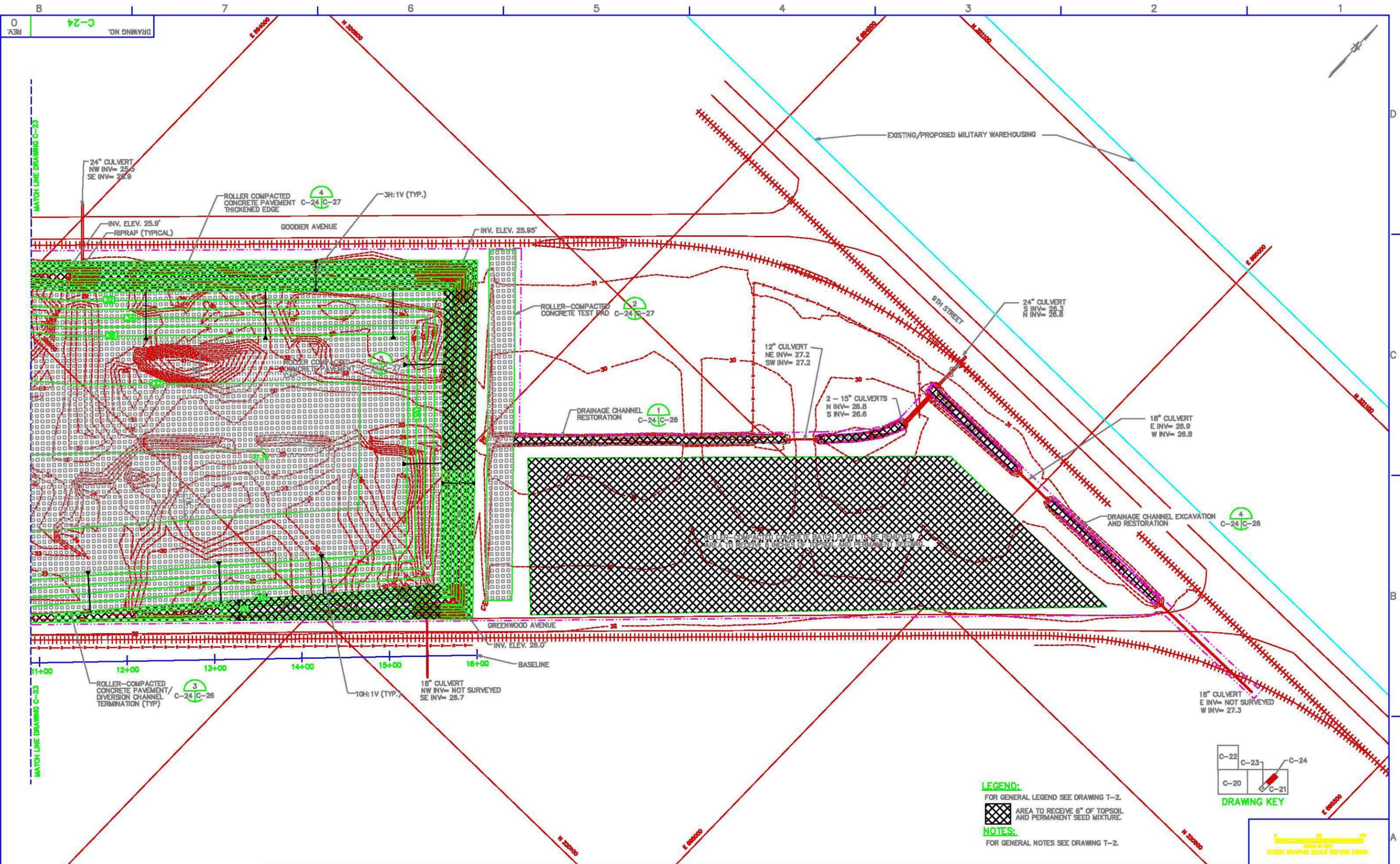


NO.	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY	DM	DATE	7/2/04
CHECKED BY	TWS	DATE	
REVISED BY		DATE	
SCALE	AS NOTED		

FIGURE 7-8
STABILIZED SOIL FOOTPRINT
100% REMEDIAL DESIGN
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

CONTRACT NO.	7379
NAVFAC NO.	5424686
APPROVED BY	
DATE	
DRAWING NO.	C-23
REV.	0



0 REV. C-24
DRAWING NO.

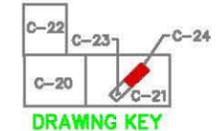
MATCH LINE DRAWING C-23

MATCH LINE DRAWING C-23

LEGEND:
FOR GENERAL LEGEND SEE DRAWING T-2.

AREA TO RECEIVE 6" OF TOPSOIL AND PERMANENT SEED MIXTURE.

NOTES:
FOR GENERAL NOTES SEE DRAWING T-2.



BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY	MF	DATE	3/08/03
CHECKED BY	TWS	DATE	5/12/03
REVISED BY		DATE	
SCALE	AS NOTED		

FIGURE 7-9
STABILIZED SIL FOOTPRINT
100% REMEDIAL DESIGN
SITE B - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

CONTRACT NO.	7379
MANFAC NO.	5424687
APPROVED BY	
DATE	
DRAWING NO.	C-24
REV.	0

ACAD:7/27/03/PL/03 10/02/04 DM RT

REVEGETATION NOTES

SECTION I - VEGETATIVE STABILIZATION METHODS AND MATERIALS

A. SITE PREPARATION

- I. INSTALL EROSION, SEDIMENT, AND STORMWATER CONTROL STRUCTURES (EITHER TEMPORARY OR PERMANENT), SUCH AS SILT FENCE, CONSTRUCTION ENTRANCE/EXIT(S), SEDIMENT RECOVERY TRAPS, AND EROSION CONTROL MATTING, PRIOR TO OTHER SITE DISTURBANCE.
- II. PERFORM ALL GRADING OPERATIONS AT RIGHT ANGLES TO THE SLOPE. FINAL GRADING AND SHAPING IS NOT NECESSARY FOR TEMPORARY SEEDING.
- III. SCHEDULE REQUIRED SOIL TESTS TO DETERMINE SOIL AMENDMENT COMPOSITION AND APPLICATION RATES. SUBMIT TEST RESULTS AND RECOMMENDATIONS FOR SEED MIXTURE AND FERTILIZER RATES FOR APPROVAL BY ROICC.

B. SOIL AMENDMENTS (FERTILIZER AND LIME SPECIFICATIONS)

- I. SOIL TESTS MUST BE PERFORMED TO DETERMINE THE EXACT RATIOS AND APPLICATION RATES FOR BOTH LIME AND FERTILIZER. SOIL ANALYSIS IS PERFORMED BY THE MISSISSIPPI COOPERATIVE EXTENSION SERVICE SOIL TESTING LABORATORY (INFORMATION IS AVAILABLE THROUGH THE COUNTY EXTENSION SERVICE OFFICE) OR BY A RECOGNIZED COMMERCIAL LABORATORY. SOIL SAMPLES TAKEN FOR ENGINEERING PURPOSES MAY ALSO BE USED FOR CHEMICAL ANALYSIS.
- II. FERTILIZERS SHALL BE UNIFORM IN COMPOSITION, FREE FLOWING, AND SUITABLE FOR ACCURATE APPLICATION BY APPROVED EQUIPMENT. MANURE MAY BE SUBSTITUTED FOR FERTILIZER WITH PRIOR APPROVAL FROM THE ROICC. FERTILIZERS SHALL BE DELIVERED TO THE SITE, FULLY LABELED ACCORDING TO APPLICABLE STATE FERTILIZER LAWS AND SHALL BEAR THE NAME, TRADE NAME OR TRADEMARK, AND WARRANTY OF THE PRODUCER.
- III. LIME MATERIALS SHALL BE GROUND AGRICULTURAL LIMESTONE (HYDRATED OR BURNT LIME MAY BE SUBSTITUTED) WHICH CONTAINS AT LEAST 90% TOTAL OXIDES (CALCIUM OXIDE PLUS MAGNESIUM OXIDE). LIMESTONE SHALL BE GROUND TO SUCH FINENESS THAT AT LEAST 50% WILL PASS THROUGH A #100 MESH SIEVE, AND 98 TO 100% WILL PASS THROUGH A #20 MESH SIEVE.
- IV. INCORPORATE LIME AND FERTILIZER EVENLY, AND INCORPORATE INTO THE TOP 4 TO 6 INCHES OF SOIL BY DISCING OR OTHER SUITABLE MEANS UNLESS INDICATED OTHERWISE THROUGH TESTING. APPLY GROUND AGRICULTURAL LIMESTONE AND FERTILIZER AT RATES IDENTIFIED IN THE SEED SUMMARY.

C. SEEDBED PREPARATION

I. TEMPORARY SEEDING

- a. SEEDBED PREPARATION SHALL CONSIST OF LOOSENING SOIL TO A DEPTH OF 4 TO 6 INCHES BY MEANS OF SUITABLE AGRICULTURAL OR CONSTRUCTION EQUIPMENT, SUCH AS DISC HARROWS, CHISEL PLOWS, OR RIPPERS MOUNTED ON CONSTRUCTION EQUIPMENT. AFTER THE SOIL IS LOOSENED, IT SHOULD NOT BE ROLLED OR DRAGGED SMOOTH, BUT LEFT IN THE ROUGHENED CONDITION. SLOPED AREAS (GREATER THAN 3H:1V) SHOULD BE TRACKED BY A DOZER LEAVING THE SURFACE IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE.
- b. SOIL pH SHALL BE BETWEEN 6.0 AND 7.0.
- c. APPLY FERTILIZER AND LIME AS PRESCRIBED ON THE SEEDING SUMMARY.
- d. INCORPORATE LIME AND FERTILIZER INTO THE TOP 4 TO 6 INCHES OF SOIL BY DISCING OR OTHER SUITABLE MEANS.

II. PERMANENT SEEDING

- a. IN ACCORDANCE WITH THE MISSISSIPPI PLANNING AND DESIGN MANUAL FOR THE CONTROL OF EROSION, SEDIMENT, AND STORMWATER (PDMCESS), PERMANENT SEEDING CHAPTER (CHAPTER 5), THE MINIMUM SOIL CONDITIONS REQUIRED FOR PERMANENT VEGETATION ESTABLISHMENT ARE AS FOLLOWS:
 1. SOIL pH SHALL BE BETWEEN 6.0 AND 7.0. ORGANIC CONTENT AT LEAST 1% ORGANIC MATTER AND SOLUBLE SALTS SHALL BE LESS THAN 500 PARTS PER MILLION (PPM).
 2. SUFFICIENT DEPTH OF SOIL TO PROVIDE AN ADEQUATE ROOT ZONE. THE MINIMUM DEPTH TO ROCK OR IMPERMEABLE LAYERS SHOULD BE 12 INCHES.
 3. SOIL MUST CONTAIN SUFFICIENT PORE SPACE TO PERMIT ADEQUATE ROOT PENETRATION.
 4. FREE FROM LARGE ROOTS, BRANCHES, STONES, LARGE CLOUDS OF EARTH, OR TRASH OF ANY KIND. CLOUDS AND STONES MAY BE LEFT ON SLOPES THAT EXCEED 3H:1V, IF SLOPES ARE TO BE HYDROSEEDED.
- b. AREAS PREVIOUSLY GRADED IN CONFORMANCE WITH THE DRAWINGS SHALL BE MAINTAINED IN A TRUE AND EVEN GRADE, THEN SCARIFIED OR OTHERWISE LOOSENED TO A DEPTH OF 4 INCHES TO PERMIT BONDING OF THE SOIL TO THE SURFACE AND TO CREATE HORIZONTAL EROSION CHECK SLOTS TO PREVENT SOIL FROM SLIDING DOWN A SLOPE.
- c. APPLY SOIL AMENDMENTS AS PER SOIL TEST.
- d. MIX SOIL AMENDMENTS INTO THE TOP 4 TO 6 INCHES OF SOIL BY DISCING OR OTHER SUITABLE MEANS. LAWN AREAS SHOULD BE RAKED TO SMOOTH THE SURFACE; REMOVE LARGE OBJECTS LIKE STONES AND BRANCHES, AND READY THE AREA FOR SEED APPLICATION. WHERE SITE CONDITIONS WILL NOT PERMIT NORMAL SEEDBED PREPARATION, LOOSEN SURFACE SOIL BY DRAGGING WITH A HEAVY CHAIN OR OTHER EQUIPMENT TO ROUGHEN THE SURFACE. STEEP SLOPES (STEEPER THAN 3H:1V) SHOULD BE TRACKED BY A DOZER, LEAVING THE SOIL IN AN IRREGULAR CONDITION WITH RIDGES RUNNING PARALLEL TO THE CONTOUR OF THE SLOPE. THE TOP 1 TO 3 INCHES OF SOIL SHOULD BE LOOSE AND FRIABLE. SEEDBED LOOSENING MAY BE NECESSARY ON NEWLY DISTURBED AREAS.

D. SEED SPECIFICATIONS

- I. ALL SEED MUST CONFORM TO MISSISSIPPI SEED LAW REGARDING NOXIOUS WEED SEED. EACH BAG OF SEED MUST BE LABELED WITH A BAG TAG SHOWING PERCENT PURE SEED, PERCENT GERMINATION (INCLUDING HARD SEED), AND PERCENT WEED SEED. ALL SEED SHALL BE SUBJECT TO RE-TESTING BY A RECOGNIZED SEED LABORATORY. THE INFORMATION ON THE BAG TAG SHALL BE FROM A SEED TEST MADE WITHIN 6 MONTHS IMMEDIATELY PRECEDING THE DATE OF PLANTING SUCH MATERIAL ON THIS JOB. SEED TAGS SHALL BE MADE AVAILABLE TO THE ROICC TO VERIFY TYPE AND RATE OF SEED USED.

E. METHODS OF SEEDING

- I. FOR TEMPORARY AND PERMANENT SEEDING, EVENLY APPLY SEED USING A CYCLONE SEEDER (BROADCAST), DRILL, CULTIPACKER SEEDER, OR HYDROSEEDER. USE SEED RATES PROVIDED IN THE SEEDING SUMMARY. BROADCASTING OR HYDROSEEDING ARE APPROPRIATE FOR STEEP SLOPES WHERE EQUIPMENT CANNOT BE DRIVEN. HAND BROADCASTING IS NOT RECOMMENDED BECAUSE OF DIFFICULTY IN ACHIEVING A UNIFORM DISTRIBUTION.
- II. HYDROSEEDING: WHEN HYDROSEEDING, SURFACE ROUGHENING IS PARTICULARLY IMPORTANT, AS A ROUGHENED SLOPE WILL PROVIDE SOME NATURAL COVERAGE OF LIME FERTILIZER AND SEED. THE SURFACE SHOULD NOT BE COMPACTED OR SMOOTH. FINE SEEDBED PREPARATION IS NOT NECESSARY FOR HYDROSEEDING OPERATIONS; LARGE CLOUDS, STONES, AND IRREGULARITIES PROVIDE CAVITIES IN WHICH SEEDS CAN LODGE.
 - a. APPLY LEGUME INOCULANTS AT FOUR TIMES THE RECOMMENDED RATE WHEN ADDING INOCULANTS TO A HYDROSEEDER SLURRY.
 - b. IF A MACHINERY BREAKDOWN OF 1/2 TO 2 HOURS OCCURS, ADD 50% MORE SEED TO THE TANK, BASED ON THE PROPORTION OF THE REMAINING SLURRY. BEYOND 2 HOURS, A FULL RATE OF NEW SEED MAY BE NECESSARY.
 - c. LIME - LIME IS NOT NORMALLY APPLIED WITH A HYDRAULIC SEEDER BECAUSE IT IS ABRASIVE. IF LIME IS APPLIED WITH A HYDRAULIC SEEDER, USE ONLY GROUND AGRICULTURAL LIMESTONE. NORMALLY NOT MORE THAN 2 TONS/ACRE ARE APPLIED BY HYDROSEEDING AT ANY ONE TIME. DO NOT USE BURNT OR HYDRATED LIME WHEN HYDROSEEDING.
 - d. SEED AND FERTILIZER SHALL BE MIXED ON SITE NO MORE THAN 30 MINUTES BEFORE APPLICATION.
 - e. IF SOIL AMENDMENTS ARE BEING APPLIED DURING HYDROSEEDING, APPLICATION BY DISCING AS DISCUSSED IN REVEGETATION NOTE (SECTION I, B, IV) NEED NOT BE PERFORMED.
- III. DRY SEEDING: THIS INCLUDES USE OF CONVENTIONAL DROP OR BROADCAST SPREADERS.
 - a. SEED SPREAD SHALL BE INCORPORATED INTO THE SOIL AT THE RATES PRESCRIBED ON THE TEMPORARY OR PERMANENT SEEDING SUMMARIES. THE SEEDBED AREA SHALL THEN BE ROLLED WITH A WEIGHTED ROLLER TO PROVIDE GOOD SEED-TO-SOIL CONTACT.
 - b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.
- IV. DRILL OR CULTIPACKER SEEDING: MECHANIZED SEEDERS THAT APPLY SEED AT THE RATES IDENTIFIED ON THE PERMANENT AND TEMPORARY SEEDING SUMMARIES AND COVER SEED WITH SOIL.
 - a. CULTIPACKING SEEDERS ARE REQUIRED TO BURY THE SEED IN SUCH A FASHION AS TO PROVIDE NO MORE THAN 1/2 INCH OF SOIL COVERING FOR GRASSES AND LEGUMES AND NO MORE THAN 1 INCH FOR SMALL GRAINS. SEEDBED MUST BE FIRM AFTER PLANTING.
 - b. WHERE PRACTICAL, SEED SHOULD BE APPLIED IN TWO DIRECTIONS PERPENDICULAR TO EACH OTHER. APPLY HALF THE SEEDING RATE IN EACH DIRECTION.

F. MULCH SPECIFICATIONS

- I. STERILE STRAW SHALL CONSIST OF THOROUGHLY THRESHED WHEAT OR OAT STRAW, REASONABLY BRIGHT IN COLOR, AND SHALL NOT BE MUSTY, MOLDY, CAKED, DECAYED, OR EXCESSIVELY DUSTY, AND SHALL BE FREE OF NOXIOUS WEED SEEDS.
 - II. WOOD CELLULOSE FIBER MULCH (WCFM)
 - a. WCFM SHALL CONSIST OF SPECIALLY PREPARED WOOD CELLULOSE PROCESSED INTO A UNIFORM FIBROUS PHYSICAL STATE.
 - b. WCFM SHALL BE DYED GREEN OR CONTAIN A GREEN DYE IN THE PACKAGE THAT WILL PROVIDE AN APPROPRIATE COLOR TO FACILITATE VISUAL INSPECTION OF THE UNIFORMLY SPREAD SLURRY.
 - c. WCFM, INCLUDING DYE, SHALL CONTAIN NO GERMINATION OR GROWTH INHIBITING AGENTS.
 - d. WCFM SHALL BE MANUFACTURED AND PROCESSED IN SUCH A MANNER THAT THE WOOD CELLULOSE FIBER MULCH WILL REMAIN IN UNIFORM SUSPENSION IN WATER UNDER AGITATION AND WILL BLEND WITH SEED, FERTILIZERS AND OTHER ADDITIVES TO FORM A HOMOGENEOUS SLURRY. THE MULCH MATERIAL SHALL FORM A BLOTTER-LIKE GROUND COVER, ON APPLICATION, HAVING MOISTURE ABSORPTION AND PERCOLATION PROPERTIES AND SHALL COVER AND HOLD GRASS SEED IN CONTACT WITH THE SOIL WITHOUT INHIBITING THE GROWTH OF THE GRASS SEEDINGS.
 - e. WCFM SHALL CONTAIN NO ELEMENTS OR COMPOUNDS AT CONCENTRATION LEVELS THAT WILL BE PHYTO-TOXIC.
 - f. WHEN HYDROSEEDING, SLURRY SHOULD INCLUDE A WCFM.
- NOTE: ONLY STERILE STRAW MULCH SHOULD BE USED IN AREAS WHERE A STAND OF ONE SPECIES OF GRASS IS DESIRED.

G. MULCHING SEEDED AREAS - MULCH SHALL BE APPLIED TO ALL SEEDED AREAS IMMEDIATELY AFTER SEEDING.

- I. IF GRADING IS COMPLETED OUTSIDE OF THE SEEDING SEASON, MULCH SHALL BE APPLIED TO THE GRADED AREAS. IN THESE CASES, ORGANIC MULCH RATHER THAN WOOD FIBER MULCH SHOULD BE USED.
- II. WHEN STERILE STRAW MULCH IS USED, IT SHALL BE SPREAD OVER ALL SEEDED AREAS AT THE RATE OF 1 TO 2 TONS/ACRE. MULCH SHALL BE APPLIED TO ACHIEVE A UNIFORM DISTRIBUTION AND DEPTH SO THAT THE SOIL SURFACE IS NOT EXPOSED, AND MUST BE ANCHORED.
- III. WOOD FIBER, OR WOOD CELLULOSE FIBER, USED AS A MULCH SHALL BE APPLIED AT A NEW DRY WEIGHT OF 0.1 TO 1.0 TONS PER ACRE. THE WOOD CELLULOSE FIBER SHALL BE MIXED WITH WATER, AND THE MIXTURE SHALL CONTAIN A MAXIMUM OF 50 LBS OF WOOD CELLULOSE FIBER PER 100 GALLONS OF WATER. WOOD CELLULOSE FIBER DOES NOT REQUIRE TACKING, AND MAY BE USED THROUGH A HYDROSEEDER SLURRY TO TACK DOWN STRAW MULCH ON STEEP SLOPES.

H. SECURING STRAW MULCH (MULCH ANCHORING): MULCH ANCHORING SHALL BE PERFORMED IMMEDIATELY FOLLOWING MULCH APPLICATION TO MINIMIZE LOSS BY WIND OR WATER. THIS MAY BE DONE BY ONE OF THE FOLLOWING METHODS DEPENDING UPON THE AREA AND EROSION HAZARD.

- I. A MULCH ANCHORING TOOL IS A TRACTOR DRAWN IMPLEMENT DESIGNED TO PUNCH MULCH INTO THE SOIL. THIS IS MOST EFFECTIVE ON LARGE AREAS, BUT IS LIMITED TO FLATTER SLOPES NO STEEPER THAN 3H:1V WHERE EQUIPMENT CAN OPERATE SAFELY ON THE CONTOUR.
 - II. WOOD CELLULOSE FIBER MAY BE USED FOR ANCHORING STRAW MULCH ON STEEP SLOPES.
 - III. APPLICATIONS OF LIQUID BINDERS SHOULD BE APPLIED HEAVIER AT EDGES WHERE WIND CATCHES MULCH, SUCH AS IN VALLEYS AND ON CRESTS OF BANKS. THE REMAINDER OF THE AREA SHOULD BE UNIFORM AFTER BINDER APPLICATION.
 - IV. LIGHTWEIGHT PLASTIC, COTTON, JUTE, WIRE, OR PAPER NETS MAY BE STAPLED OVER THE MULCH ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. PLASTIC NETTING IS VERY EFFECTIVE IN HOLDING MULCH IN PLACE ON WATERWAYS AND SLOPES BEFORE GRASSES BECOME ESTABLISHED.
 - V. PEG AND TWINE: SECURE MULCH BY STRETCHING TWINE BETWEEN 8 TO 10 INCH LONG WOODEN PEGS DRIVEN TO WITHIN 3 INCHES OF THE SOIL SURFACE EVERY 4 FEET IN ALL DIRECTIONS. SECURE MULCH BY STRETCHING TWINE BETWEEN PEGS IN A CRISS-CROSS-WITHIN-A-SQUARE PATTERN.
- ### I. REPAIRS AND MAINTENANCE
- GENERALLY, A STAND OF VEGETATION CANNOT BE DETERMINED TO BE FULLY ESTABLISHED UNTIL SOIL COVER HAS BEEN MAINTAINED FOR ONE FULL YEAR FROM PLANTING. INSPECT ALL SEEDED AREAS FOR FAILURES AND MAKE NECESSARY REPAIRS AND RESEEDINGS WITHIN THE SAME PLANTING SEASON, IF POSSIBLE.
- I. IF VEGETATION FAILS TO GROW, SOIL MUST BE TESTED TO DETERMINE IF ACIDITY OR NUTRIENT IMBALANCE IS RESPONSIBLE.
 - II. RESEEDING - IF A STAND HAS INADEQUATE COVER, AS DETERMINED BY THE ROICC, RE-EVALUATE CHOICE OF PLANT MATERIALS AND QUANTITIES OF LIME AND FERTILIZER. RE-ESTABLISH THE STAND AFTER SEEDBED PREPARATION OR OVERSEED THE STAND. CONSIDER SEEDING TEMPORARY ANNUAL SPECIES IF THE TIME OF YEAR IS NOT APPROPRIATE FOR PERMANENT SEEDING.
 - III. FERTILIZATION - ON THE TYPICAL DISTURBED AREA, FULL ESTABLISHMENT USUALLY REQUIRES REFERTILIZATION IN THE SECOND GROWING SEASON. FINE TURF REQUIRES ANNUAL MAINTENANCE FERTILIZATION. USE SOIL TESTS IF POSSIBLE OR APPLY 200 TO 300 POUNDS OF 13-13-13 FERTILIZER PER ACRE WHEN GROWTH BEGINS. APPLY ADDITIONAL NITROGEN, IF NEEDED, DURING THE GROWING SEASON.
 - IV. FOR TEMPORARY SEEDING, RESEED AND MULCH AREAS AS SOON AS POSSIBLE WHERE SEEDLING IMMERSION IS POOR, OR WHERE EROSION OCCURS. DO NOT MOW. PROTECT FROM TRAFFIC AS MUCH AS POSSIBLE.

SECTION II - TEMPORARY SEEDING

VEGETATION - ANNUAL GRASS USED TO PROVIDE COVER ON DISTURBED AREAS FOR UP TO 12 MONTHS. FOR LONGER DURATION OF VEGETATIVE COVER, PERMANENT SEEDING IS REQUIRED.

TEMPORARY SEEDING SUMMARY

SPECIES	SEED MIXTURE (SEE TABLE 5.4 OF THE MISSISSIPPI PDMCESS)		SEEDING DEPTHS	FERTILIZER RATE (13-13-13)	LIME RATE (TONS/ACRE)
	APPLICATION RATE (LB/AC)	SEEDING DATES			
RYEGRASS	30	9/1 - 11/30	1/2 INCH	600 LB/AC (14 LBS/1000 SF)	1 TO 1/2 (COARSE TEXTURED SOIL) 2 TO 3 (FINE TEXTURED SOIL)

- NOTES:
1. FERTILIZER AND LIME APPLICATION RATES MAY VARY DEPENDING UPON THE RESULTS OF THE SOIL TEST INDICATED IN REVEGETATION NOTE SECTION I,B,I.
 2. ALL OTHER SEED SPECIES IDENTIFIED IN TABLE 5.4 OF THE MISSISSIPPI PDMCESS ARE APPROPRIATE FOR PLANTING IN ZONE 3. CHECK WITH THIS TEMPORARY SEEDING TABLE (TABLE 5.4 OF THE MISSISSIPPI PDMCESS) FOR APPLICATION RATE IF ANOTHER SPECIES OF SEED IS SELECTED.
 3. SEEDING DEPTHS - VERY SMALL GRAINS SHOULD BE PLANTED NO MORE THAN 1 INCH DEEP AND GRASSES AND LEGUMES NO MORE THAN 1/2 INCHES DEEP.

SECTION III - PERMANENT SEEDING

SEEDING GRASS AND LEGUMES TO ESTABLISH GROUND COVER FOR A MINIMUM PERIOD OF ONE YEAR ON DISTURBED AREAS GENERALLY RECEIVING LOW MAINTENANCE.

PERMANENT SEEDING SUMMARY

SPECIES	SEED MIXTURE (SEE TABLE 5.2 OF THE MISSISSIPPI PDMCESS)		SEEDING DEPTHS	FERTILIZER RATE (13-13-13)	LIME RATE (TONS/ACRE)
	APPLICATION RATE (LB/AC)	SEEDING DATES			
COMMON BERMUDA GRASS	15	3/1-7/15 9/1-11/30	1/4-1/2 INCHES	600 LB/AC (14 LBS/1000 SF)	2

- NOTES:
1. FERTILIZER AND LIME APPLICATION RATES MAY VARY DEPENDING UPON THE RESULTS OF THE SOIL TEST INDICATED IN REVEGETATION NOTE SECTION I,B,I.
 2. WHEN PLANTING BETWEEN 12/1 AND 2/28 USE COMMON BERMUDA GRASS (10 LBS/ACRE) AND ANNUAL RYEGRASS (30 LBS/ACRE).

NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY
DM
DATE
6/29/04

CHECKED BY
TWS
DATE

REVISOR BY
DATE

SCALE
AS SHOWN

FIGURE 7-11
REVEGETATION NOTES
SITE B - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI

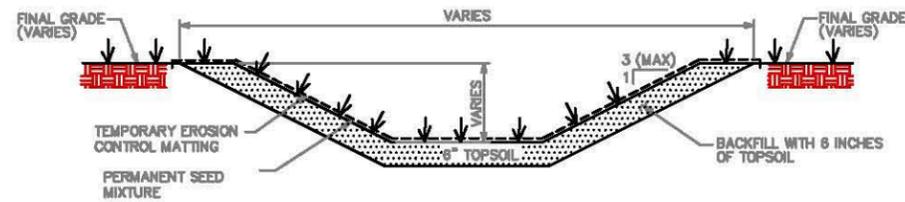
CONTRACT NO.
7379

NAVFAC NO.
5424675

APPROVED BY
DATE

DRAWING NO.
C-12

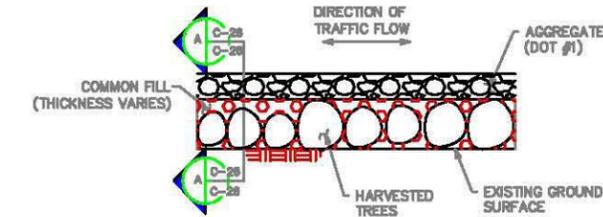
REV.
0



DRAINAGE CHANNEL RESTORATION DETAIL

NOT TO SCALE

1
C-21 C-25
C-24

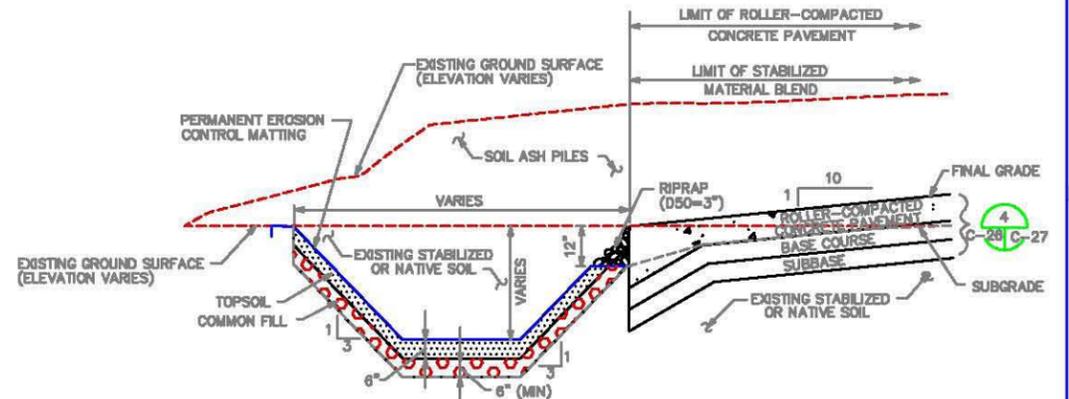


SECTION

TEMPORARY SITE ACCESS ROAD AND DIVERSION CHANNEL

NOT TO SCALE

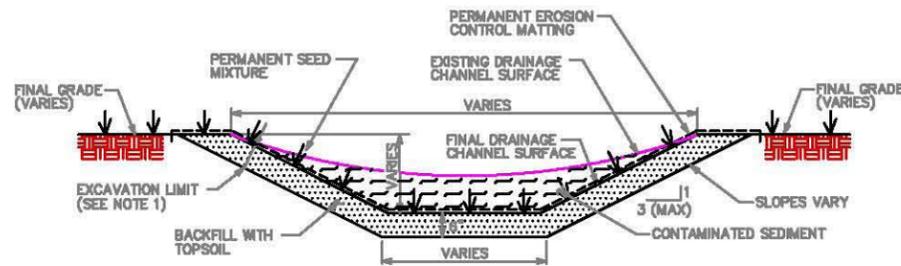
2
C-8 C-26



ROLLER COMPACTED CONCRETE PAVEMENT/DIVERSION CHANNEL TERMINATION DETAIL

NOT TO SCALE

3
C-9 C-26
C-10
C-23
C-24

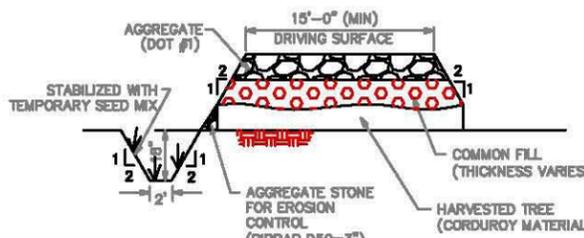


DRAINAGE CHANNEL DITCH EXCAVATION AND RESTORATION DETAIL

NOT TO SCALE

4
C-15 C-25
C-16
C-18
C-19
C-20
C-21
C-23
C-24

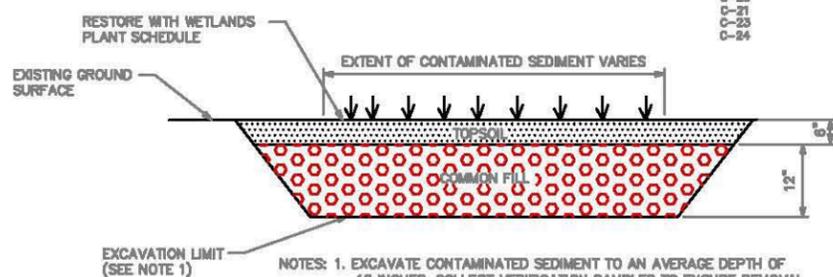
NOTES: 1. EXCAVATE CONTAMINATED SEDIMENT AND 6 INCHES OF UNDERLYING SOIL.



TEMPORARY HAUL ROAD (TYPICAL)

NOT TO SCALE

5
C-5 C-26
C-11

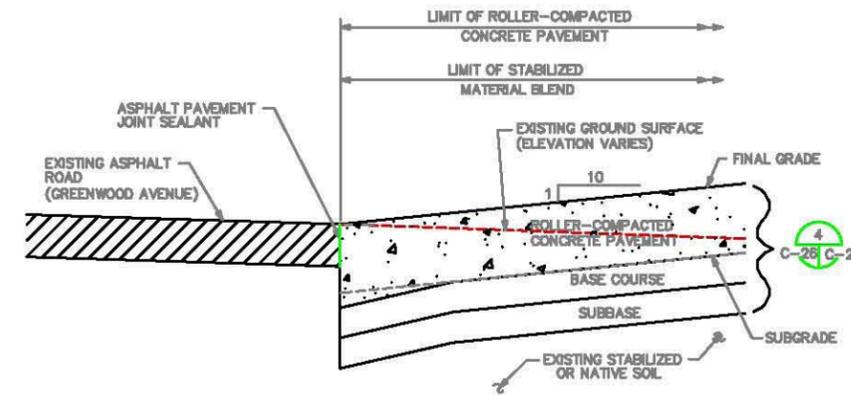


OFF-BASE AREA OF CONTAMINATION EXCAVATION AND RESTORATION DETAIL

NOT TO SCALE

6
C-22 C-25

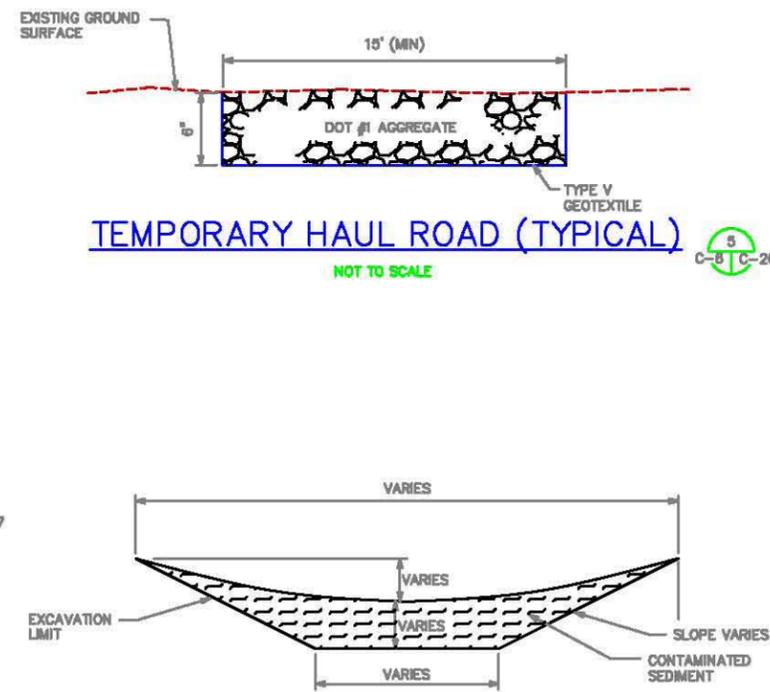
NOTES: 1. EXCAVATE CONTAMINATED SEDIMENT TO AN AVERAGE DEPTH OF 18 INCHES. COLLECT VERIFICATION SAMPLES TO ENSURE REMOVAL OF CONTAMINATED SEDIMENT. REMOVE ADDITIONAL SOIL AS NEEDED TO MEET PRGs.



ROLLER COMPACTED PAVEMENT/ASPHALT ROAD TERMINATION DETAIL

NOT TO SCALE

7
C-23 C-26



DRAINAGE CHANNEL EXCAVATION DETAIL

NOT TO SCALE

8
C-15 C-25
C-16
C-18
C-19

NOTES:

- TEMPORARY STRUCTURES/FACILITIES SHALL ACCOMMODATE CONTRACTOR'S OPERATIONS SUBJECT TO ROIOC APPROVAL. SIZES OF TEMPORARY STRUCTURES/FACILITIES SHALL BE PROVIDED IN THE CONTRACTOR'S WORK PLAN.

NO.	DATE	REVISIONS	BY	CHKD	APPD	NO.	RELEASED FOR	BY	DATE

DRAWN BY HJB	DATE 2/10/03
CHECKED BY TWS	DATE 5/12/03
REVISED BY	DATE
SCALE AS SHOWN	

**FIGURE 7-12
REVEGETATION DETAILS
SITE 8 - HERBICIDE ORANGE STORAGE AREA
NAVAL CONSTRUCTION BATTALION CENTER
GULFPORT, MISSISSIPPI**

CONTRACT NO. 7379	REV. NO. 0
MANFAC NO. 5424689	
APPROVED BY	DATE
DRAWING NO. C-28	

ACAD: 7/23/03.dwg 10/20/04 10:11:11 AM

*Final Remedial Action/Corrective Action Work Plan
Site 8 – Herbicide Orange Storage Area and Off-Base Area of Contamination
Naval Construction Battalion Center
Gulfport, Mississippi
Contract Number N62467-02-D-0468 - CTO 002*

October 2004

APPENDICES

Appendix A

Erosion and Sediment Control Plan/Storm Water Pollution Prevention Plan



FINAL STORMWATER POLLUTION PREVENTION PLAN

**Site 8 – Herbicide Orange Storage Area and
Off-Base Area of Contamination**

**Naval Construction Battalion Center
Gulfport, Mississippi**

October 2004

**Prepared for:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29406**

Prepared by:
Environmental Chemical Corporation
1240 Bayshore Highway
Burlingame, CA 94010

Prepared under:
Contract Number N62467-02-D-0468
Contract Task Order 002

**FINAL
STORMWATER POLLUTUION PREVENTION PLAN
FOR
SITE 8 – HERBICIDE ORANGE STORAGE AREA
AND
OFF-BASE AREA OF CONTAMINATION**

**Naval Construction Battalion Center
Gulfport, Mississippi**

Submitted to:

**Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
North Charleston, SC 29406**

Submitted by:

**Environmental Chemical Corporation
1040 Bayshore Highway
Burlingame, CA 94010**

**Contract Number N62467-02-D-0468
Contract Task Order 002**

October 2004

PREPARED UNDER THE SUPERVISION OF:

APPROVED FOR SUBMITTAL BY:

Prashant Khanna
Project Manager
Environmental Chemical Corporation

Robert W. Anderson
Quality Control Manager
Environmental Chemical Corporation

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LIST ACRONYMS AND ABBREVIATIONS

AOC	(Off-base) Area
bgs	below ground surface
BMP	Best Management Practices
CAP	Corrective Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
ECC	Environmental Chemical Corporation
EPA	United States Environmental Protection Agency
EPD	Environmental Protection Division
ESCP	Erosion and Sediment Control Plan
FFS	Focused Feasibility Study
HRSA	Hazardous Site Response Act
HO	Herbicide Orange
LLDPE	linear low density polyethylene
LTM	long-term monitoring
LUCs	land-use controls
MCRD	Marine Corps Recruit Depot Parris Island
MDEQ	Mississippi Department of Environmental Quality
MSWCC	Mississippi Soil and Water Conservation Commission
µg/kg	microgram per kilogram
NAVFAC	Naval Facilities Engineering Command
Navy	United States Navy Southern Division
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
PDMCESS	Planning and Design Manual for the Control of Erosion, Sediment, and Storm water
Permit	NPDES Permit for Storm Water Discharges from Construction Activities
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
ROICC	Resident Officer in Charge of Construction
SDIV	Southern Division
SWMU	Solid Waste Management Unit
SWPPP	Storm Water Pollution Prevention Plan
USAF	United States Air Force
USDA	United States Department of Agriculture

PREAMBLE

The Southern Division Naval Facilities Engineering Command (NAVFAC) has contracted Environmental Chemical Corporation (ECC) to perform the remediation and construction activities described in this Storm Water Pollution Prevention Plan (SWPPP) under the authority of Mississippi's General National Pollution Discharge Elimination System (NPDES) Permit for Storm Water Discharges from Construction Activities (Permit). ECC will ensure that all personnel are qualified to perform the work as outlined in the Permit regulations. ECC understands that compliance with all conditions of the Permit is mandatory and that non-compliance would constitute a violation of the Mississippi Pollution Control Act and the Clean Water Act and would be grounds for enforcement action; for Permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The Permit regulations are required to be onsite during performance of the work. A copy of the regulations has been included as Appendix B. All contracted co-permit recipient will sign a certification as shown in 7.0.

GENERAL PURPOSE

This SWPPP serves the following purposes:

- (1) To identify potential sources of pollution that could impact the quality of storm water discharges associated with the remediation and construction activities from the site, and
- (2) To describe the implementation practices that will minimize and control pollutants in storm water discharges associated with construction activity from this site.

The implementation practices will provide a means for compliance within the terms and conditions of the Permit.

SITE - OWNER INFORMATION

Site / Project Name: Site 8 – Herbicide Storage Area and Off-base
Area of Contamination

Site Location: Naval Construction Battalion Center
Gulfport, Mississippi

Owner / Primary Permit recipient: United States Navy
Southern Division
Naval Facilities Engineering Command

Owner / Primary
Permit recipient Address and Phone: 2155 Eagle Drive
North Charleston, SC 29419-9010
Phone: (843) 820-7482

General Contractor (Operator): Environmental Chemical Corporation
General Contractor Address and Phone: 1240 Bayshore Highway
Burlingame, California 94010
(650) 347-1555

Land Disturbance Activity Permit Number: _____

Date Notice of Intent (NOI) filed: _____

Description of the proposed project: The primary objective of this project is to remediate soils and sediments at a former herbicide storage site and along drainages on base and off-base. The corrective action will involve respectively: the excavation of contaminated soils and sediments, grading of the surface and side slopes for drainage, stabilization/solidification of the contaminated materials, consolidation of the treated material in a landfill, installation of a rolled concrete cap over the landfill, backfilling excavated areas, wetlands restoration, and revegetation.

1.0 INTRODUCTION

This document presents the Final (100 percent) Storm water Pollution Prevention Plan (SWPPP) for Site 8 and the Off-base Area of Contamination (AOC) at the Naval Construction Battalion Center (NCBC) in Gulfport, Mississippi. NCBC Gulfport is located in the southeastern corner of Mississippi, approximately 2 miles north of the Gulf of Mexico. The base is located in the western part of the city of Gulfport in Harrison County. Figure 1-1 shows the location of the base in relation to the city of Gulfport and the Gulf of Mexico. The off-base AOC is located north of NCBC, across 28th Street near Outfall 3. The base occupies 1,100 acres with an average elevation of approximately 30 feet above mean sea level. Two rectangular piles of bauxite (aluminum ore) are approximately 45 feet higher than the adjacent ground surface. A map of NCBC Gulfport is provided as Figure 1-2.

For the remainder of this document, Site 8 and the Off-base AOC will be referred to as the Site. The SWPPP has been prepared by Environmental Chemical Corporation (ECC) under Contract Number N62467-02-D-0468 on behalf of the United States Navy (Navy) Southern Division (SDIV) Naval Facilities Engineering Command (NAVFAC). The objective of this Final SWPPP is to establish site procedures to control storm water and prevent the transport of sediments from the construction site. The Final SWPPP was prepared in accordance with Mississippi's General National Pollution Discharge Elimination System (NPDES) Permit for Storm water Discharges from Construction Activities. Comments made to the Final SWPPP will be incorporated into the Final SWPPP submittal.

1.1 Site History

Prior to 1968, Site 8 was used as an equipment storage and staging area. Around 1961, the surface soils were stabilized with Portland cement to provide a hardened surface for heavy equipment operation and storage. Between 1968 and 1977, Site 8 was used by the United States Air Force (USAF) as a storage area for drums containing Herbicide Orange (HO). In 1977, the HO drums were removed from Site 8, transported to port by railroad, and placed on a ship for destruction by incineration in the South Pacific. The release of dioxins at Site 8 from the HO was confirmed in 1977, and the site was fenced and left inactive until 1985 (TtNUS, 2003). It was originally believed that 13 acres of Site 8 stored approximately 850,000 gallons of HO. This 13-acre area is currently referred to as Site 8A (HLA, 2000). In 1985, the USAF began operations to clean up the dioxin-contaminated soils that remained on site following the removal of the drums of HO. The dioxin contamination of soils resulted from several spills and leaks during the 10 years that HO was stored on Site 8. Through a Research, Development and Demonstration Permit obtained through the United States Environmental Protection Agency (EPA) Region 4, the USAF conducted test burns to demonstrate that incineration was capable of reducing the dioxin concentrations to 1.0 microgram per kilogram ($\mu\text{g}/\text{kg}$), the EPA criterion at that time. During the test burns, two additional areas outside the original 13 acres were identified and verified as previous storage locations for drums containing HO. These two areas were designated as Sites 8B and 8C.

Following EPA acceptance of the test burn data, full-scale incineration of dioxin-contaminated soils from Sites 8A, 8B, and 8C was conducted. The incineration process was conducted within the boundaries of Site 8A and was completed in 1988. The ash that remained from the incineration process was stored and currently remains on Site 8A. Although the soils within Sites 8A, 8B, and 8C were incinerated, the drainage channels that carry surface water and sediment from these sites to the lower reaches of the local drainage basin were not addressed during this remedial effort (HLA, 2000).

From 1988 when the USAF remedial effort was completed through 2000, access to Site 8A was restricted and no base operations were conducted within the site boundaries. In January 2001, a new rail-loading ramp was constructed on the south side of Site 8A in anticipation of using the site as a storage and staging area (TtNUS, 2003). Additional details on the site history are included in Section 1.3 of the Remediation Planning Document (HLA, 2000).

1.2 Project Description

As part of the remedial action (RA) for Site 8, the Navy will:

- Excavate dioxin-contaminated soil and sediment from on-base drainage channels contiguous to Site 8 and from the associated off-base AOC located north of the base;
- Excavate soil ash located at Site 8;
- Consolidate, blend, and stabilize contaminated soil/sediment and soil ash within a portion of Site 8;
- Construct a 12-inch thick, roller-compacted concrete cap over the stabilized material;
- Perform verification sampling;
- Restore the on-base drainage channels and off-base AOC affected by excavation activities;
- Restore designated wetland areas;
- Implement land-use controls; and
- Perform long-term monitoring.

The RA is expected to impact the 13-acre area of Site 8A, 18 acres of on-base drainage channels, and 19 acres of off-base wetland. This SWPPP summarizes the design basis for the remedial alternative selected in the Focused Feasibility Study (FFS) for Site 8 (TtNUS, 2003). This alternative was selected to protect public health, welfare, and the environment from exposure to dioxins that are degradation products of the HO formerly stored at Site 8. The Navy's goal is to begin the RA at Site 8 and the affected on-base drainage channels and off-base AOC as quickly as possible to protect human health and the environment and to comply with Applicable or Relevant and Appropriate Requirements and "To Be Considered" criteria.

1.3 Plan Objective and Content

The objective of this SWPPP is to describe the project and to present the storm water pollution prevention controls that will be used during implementation of the RA at Site 8 and its contiguous on-base drainage channels and off-base AOC. Section 2.0 presents a description of control measures to be implemented during the RA and the sequence of proposed construction activities. Section 3.0 presents a generalized summary of State and local requirements for storm water management. Section 4.0 presents the inspection and maintenance program proposed for the RA. Section 5.0 presents a summary of non-storm water discharges and pollution prevention measures to be employed during the RA. Sections 6.0 and 7.0 present the required plan certifications. Copies of the EPA checklists for Storm water Pollution Prevention Plans are presented in Appendix A. Design drawings and technical specifications are provided under separate cover.

1.4 Anticipated Remediation and Construction Activities

Land disturbance will involve the entire project site, for a total of approximately 10.4 acres, including the anticipated area of impacted salt water marsh. The sequence of major land disturbances on site will consist of the following:

- Installation of construction entrance(s) and initial erosion controls;
- Clearing of surface debris, grass, weeds, brush, shrubs, and trees;
- Installation of silt fencing and erosion control logs;
- Establish field offices, personnel and equipment decontamination facility, fencing and gate, utilities required to perform the work, traffic controls, and survey controls;
- Set up equipment and material processing area at site 8A;
- Excavate contaminated soils and sediments from the on-base drainages and the off-base AOC and transport to the material processing area;
- Process excavated material with additives and fly ash to stabilize the dioxin contamination;
- Compact, if necessary, the stabilized material;
- Grade the surface of the stabilized material pile to final slope grades.
- Construct rolled concrete cap over the stabilized material pile;
- Restore wetlands; and
- Perform Long-Term Monitoring (LTM) for Site to protect against exposure risks.

2.0 SITE DESCRIPTION

Site 8 consists of three contiguous storage areas located in the north-central portion of NCBC Gulfport (Figure 2-1). The three storage areas comprising Site 8 are designated as Sites 8A, 8B, and 8C. The main former HO drum storage area (Site 8A), which encompasses approximately 13 acres, has an undulating surface due to previous remedial activities and is covered with light vegetation (Design Drawings C-4 and C-5). The surface soil in non-stabilized areas is typically a fine- to medium-grained sand. Approximately one-third of Site 8A consists of stabilized areas where HO drums were stored. The surface soil in storage areas at NCBC is typically stabilized using Portland cement to improve the load-bearing capacity and thus provide a surface suitable for equipment storage and staging. Site 8A includes the upper reaches of the drainage areas for the eastern two-thirds of the base. Surface drainage from Site 8A flows to the northwest, exiting the base at Outfall 3 into a drainage system that feeds Canal No. 1. Canal No. 1 flows north to Turkey Creek (TtNUS, 2003). Prior to 1995, the surface water that exited the base through Outfall 3 discharged to a wetland that is part of the Turkey Creek drainage basin (HLA, 2000).

Sites 8B and 8C contain the majority of the on-base drainage channels that require restoration (contaminated sediments previously removed). Sites 8B and 8C encompass approximately 18 acres of relatively flat terrain with almost no vegetation (Design Drawings C-1 and C-2). Sites 8B and 8C were also used for storage of drums containing HO. The Site 8B and 8C surface soils consist of fine- to medium-grained sand, and approximately one-third of these areas are stabilized with Portland cement. Sites 8B and 8C are also located at the head of local drainage basins. Surface water from Site 8B flows north, exiting the base at Outfall 4, and continuing into the Turkey Creek drainage basin. Surface water from Site 8C drains to the southeast, exiting the base at Outfall 2 and continuing into Brickyard Creek (TtNUS, 2003).

The on-base drainage channels scheduled for excavation and restoration are shown on Figure 2-2. Two types of dioxin-contaminated sediment have been observed in the on-base drainage channels (TtNUS, 2001). In the upper reaches of the drainage channel system, the prevalent sediment type is a fine-grained sand with small amounts of vegetation and organic material, 1 to 3 inches in depth. In the lower reaches of the drainage channel system, where free-standing water is typically observed year round, decayed organic matter and settled fines are present in a layer above the fine-grained sand.

The off-base AOC consists of impacted drainage channels contained within property currently owned by Mr. G.E. Arndt (the Arndt property) and Mr. P.W. Bennett (the Bennett property). Within this drainage channel reach, dioxin-contaminated sediment has also been deposited outside the banks of the drainage channels as a result of high-flow conditions during major storm events. Design Drawing C-3 presents the extent of contamination within the off-base AOC.

The primary transport mechanism of dioxin-contaminated sediment in the off-base AOC drainage channels is the high-velocity surface water flow associated with major storm events. These storm events are responsible for the downstream migration of dioxin-contaminated sediment; however, the deposition of these sediments is influenced by the elevation changes

associated with three terraces identified along the drainage patterns. These terraces, with unique depositional patterns, soil types, and vegetation, are as follows:

- Terrace 1 is located at the lowest elevation, or level, and forms the main channel. The surface of the soil consists mainly of organic-rich silts and clays. The soil becomes increasingly sandy below this surface layer. This terrace supports very little under story vegetation due to frequent flooding and poor drainage. This terrace was identified to be the most likely to contain significant levels of dioxin contamination.
- Terrace 2 forms a margin that surrounds the Terrace 1 main channel at elevations slightly higher than Terrace 1. The organic-rich surface soil layer is thinner than Terrace 1 and contains some sand. Terrace 2 supports more under story vegetation, which visually distinguishes it from Terrace 1.
- Terrace 3 occurs along the highest elevations in the study area. The soils are well-drained, dark brown, fine to medium sands that support abundant under story vegetation. These coarser-grained soils are the main distinguishing feature between Terrace 3 and Terrace 2.

2.1 Nature of Remediation and Construction Activity

As part of the remedial action (RA) for Site 8, the Navy will:

- Excavate dioxin-contaminated soil and sediment from on-base drainage channels contiguous to Site 8 and from the associated off-base AOC located north of the base;
- Excavate soil ash located at Site 8;
- Consolidate, blend, and stabilize contaminated soil/sediment and soil ash within a portion of Site 8;
- Construct a 12-inch thick, roller-compacted concrete cap over the stabilized material;
- Perform verification sampling;
- Restore the on-base drainage channels and off-base AOC affected by excavation activities;
- Restore designated wetland areas;
- Implement land-use controls; and
- Perform long-term monitoring.

The RA is expected to impact the 13-acre area of Site 8A, 18 acres of on-base drainage channels, and 19 acres of off-base wetland. This SWPPP summarizes the design basis for the remedial alternative selected in the Focused Feasibility Study (FFS) for Site 8 (TtNUS, 2003). This alternative was selected to protect public health, welfare, and the environment from exposure to dioxins that are degradation products of the HO formerly stored at Site 8. The Navy's goal is to begin the RA at Site 8 and the affected on-base drainage channels and off-base AOC as quickly as possible to protect human health and the environment and to comply with Applicable or Relevant and Appropriate Requirements and "To Be Considered" criteria.

The final phase of construction is the restoration of the wetlands within the off-base AOC. The depth, frequency of tidal inundation, and vegetation of the adjacent marsh areas have been surveyed to become the basis of design for the restored area. Construction activities will consist of installation of erosion control devices, excavation of contaminated sediments and placement on the landfill surface, placing soil backfill and re-vegetation. All construction equipment will be stored, maintained, and refueled in neighboring non-wetland areas.

2.2 Major Land Disturbances

The anticipated major land disturbance will consist of the following activities:

1. Installation of construction entrance(s) and initial erosion control devices;
2. Clearing;
3. Installation of silt fencing and silt control logs;
4. Excavation and solidification of impacted soils;
5. Grading and compaction of solidified soils;
6. Installing a rolled concrete cap over the solidified soils; and
7. Placement of fill in the AOC.

2.3 Post-Developed Site Drainage and Land-Use

The Site is currently covered with vegetation, some trees, and brush. After remediation, the Site will be grassed. The post-developed runoff coefficient will be comparable to the pre-developed, as the land use and impervious area will not change.

The center of the capped material stockpile will be the apex of drainage, sloping down at one percent or more. The edges of the capped stockpile will slope down at a grade of 10 horizontal to 1 vertical to the elevation of the Site 8 ground surface. Storm water runoff will discharge directly from the concrete cap as sheet flow into the surrounding drainage channels. Turkey Creek is the immediate off-site drainage that will receive Site storm water discharge, which ultimately drains to the Gulf of Mexico.

The post-developed site will be engaged in long-term monitoring of sediment and groundwater. A Land-Use Control Implementation Plan and Land-Use Control Assurance Plan will be employed to control or eliminate chemical exposure. The Site will be re-evaluated every 5 years to determine if changes to the land-use controls, monitoring, or remedial action are necessary.

3.0 SEDIMENT AND EROSION CONTROLS

This section describes sediment and erosion controls to be employed during the Site 8 project. It describes the timing and process of sediment and erosion control measures, as well as site restoration practices and pre- and post-construction activities.

3.1 Pre-Construction and During Construction

Storm water runoff controls for the Site will consist of the structural control measures and the maintenance and inspection practices discussed later in this SWPPP. These structural control measures have been designed to retain sediment onsite. The location and type of structural control measures to be used have been identified in the Erosion and Sediment Control Plan (ESCP). The Operator will be responsible for the implementation and execution of this SWPPP. The Notice of Intent (NOI) form shall be filed with the Mississippi Department of Environmental Quality (MDEQ) prior to any land disturbance. Pre-construction groundcover will not be destroyed, removed, or disturbed more than 21 calendar days prior to grading or earth moving activities unless temporary cover is installed. Temporary or permanent stabilization of the Site will be completed within 14 days of final grading or earth moving activities, unless construction activity will resume on a portion of the site within 21 days from when activities ceased. Erosion and sediment control structures must be in place and functional before earth moving activities begin. Temporary erosion control measures may be removed at the beginning of the workday, but will be replaced at the end of the day. The goal of this SWPPP is to maintain and protect the natural, physical, and biological characteristics and functions (e.g., no significant changes in the hydrological regime or pollutant input) of the receiving water.

3.2 Erosion, Sediment, and Storm Water Control Measures

Unless otherwise noted in this plan or in the construction documents, erosion, sediment, and storm water control measures will be implemented, installed, and maintained according to the standards and specifications of the Planning and Design Manual for the Control of Erosion, Sediment, and Storm water (PDMCESS) produced in April 1994 (USDA, 1994). The PDMCESS was produced with the cooperation of the United States Department of Agriculture (USDA) Natural Resources Conservation Service, the Mississippi Department of Environmental Quality (MDEQ), and the Mississippi Soil and Water Conservation Commission (MSWCC). The required erosion, sediment, and storm water control measures are shown on Design Drawings C-6 through C-10 and are as follows:

- Construction entrance(s)/exit(s) will be provided off Greenwood Avenue, Holtman Avenue, Brown Avenue and Eighth Street for work to be performed on base and off 28th Street for work to be performed off base. These construction entrance(s)/exit(s) will be protected with silt fencing or super silt fencing.

- Silt fencing will be placed along the downslope sides of access roads, construction entrance(s)/exit(s), support facilities [i.e., the decontamination pad(s), staging area(s), and material handling pad], and around identified excavation areas.
- Super silt fence will be installed along the limit of stabilized material blend, or cap, to decrease runoff velocities and protect certified clean stabilized drainage channels.
- A temporary diversion, stabilized immediately after installation, will be placed along the upslope side of the temporary access road that will be constructed to access the off-base AOC. The diversion will collect storm water runoff and divert the flow to controlled locations.
- Sediment Recovery Traps (SRTs) will be constructed to segregate excavation areas within the off base AOC.

The Contractor will be responsible for the implementation, maintenance, and inspection of the SWPPP stabilization and structural practices during the RA.

3.2.1 Clearing Phase Stabilization & Structural Practices

No erosion or sediment control practices are necessary at this phase, as no land will be disturbed at this point. Trees will be cut to 6” above ground level, leaving all roots intact. The remaining tree roots and existing ground cover will continue to stabilize the soil. However, if a daily site inspection determines that construction traffic is destroying natural ground cover or deemed necessary for any other reason, the construction exit will be installed and type ‘A’ silt fence will be installed around the perimeter of the disturbed area.

3.2.2 Grading and Excavation Phase Stabilization and Structural Practices

Structural Practices

The following structural practices will be used during and/or following construction activities at Site 8 to control erosion and sedimentation:

- Construction Entrance(s)/Exit(s) - Temporary construction entrance(s) and/or exits(s) will be installed to provide access to Site 8A from Greenwood Avenue, to Site 8B from Holtman Avenue, to on-base drainage channels from Brown Avenue and Eighth Street, and to the off-base AOC from 28th Street. Construction vehicles will be cleaned before exiting the site.
- Silt Fence - Silt fencing will be installed along the downslope sides of access roads, construction entrance(s) and exit(s), support facilities, and excavation areas.
- Super Silt Fence - Super silt fencing will be installed around the Site 8A cap area.

- **Sediment Tank** - A sediment tank will be available on site for use in dewatering excavation areas and for collecting decontamination waters. Water from excavations may be collected in a temporary holding tank, tested, and disposed at an appropriate off-site facility, if necessary. In the event that a determination is made to allow discharge of the collected water onto the ground surface, water will first be cleaned of sediment and then broadcast over an approved vegetated area or designated drainage channel. Water from the decontamination pad will be collected in a temporary holding tank, tested, and disposed at an appropriate off-site facility, if necessary.
- **Surface Roughening** - The surface of re-graded areas will be roughened to reduce runoff velocity and to aid in the establishment of vegetative cover.
- **Temporary Seeding** - All re-graded areas that will be left dormant for extended periods of time shall be seeded with fast-germinating temporary vegetation immediately following grading. Seeding will be performed dependent on the time of year, in accordance with the Seeding Chart in the Mississippi Storm water Pollution Prevention Plan Guidance Manual for Construction Activities produced by the General Permits Branch of the Office of Pollution Control (OPC) in the MDEQ (OPC, 2000).
- **Permanent Seeding** - All re-graded areas not receiving roller-compacted concrete or wetland plantings will be permanently seeded with a seed mixture that will minimize erosion and provide suitable food and cover for wildlife. The permanent seed mixture for this RA is presented in Section 2.7 and on Design Drawing C-12.
- **Mulching** - All areas receiving permanent seeding will be mulched with an organic material that prevents erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow.
- **Diversion** - A temporary diversion will be constructed along the off-base AOC temporary access road. The diversion will be used to collect storm water runoff and convey around the excavation.
- **Culverts** - Culverts placed periodically below the temporary access road constructed along the off base AOC will allow the diversions to collect storm water runoff at selected locations (depending on the severity of the storm). The off-base AOC end of each culvert will be covered with filter fabric to prevent the migration of contaminated sediments from the off-base AOC to the diversion.
- **Sediment Recovery Traps** - SRTs will be constructed to segregate areas of excavation within the off base AOC. The SRTs, which are constructed using gabions and filter fabric, will prevent the migration of contaminated sediments into uncontaminated areas during rainfall events or storm surges. These SRTs will be removed after the off-base area is stabilized with vegetation.
- **Sheet Piling** - Sheet piling will be placed within the on-base drainage channels to divide on-base drainage channels into manageable channel segments. After insertion of the sheet piles, water within the channels will be pumped and contaminated sediment excavated. Concurrently disturbed channel segments should be limited to three and the segments should be adjacent to each other.

3.2.3 Management Strategies

The following management strategies will be utilized during the RA:

- Unstabilized, disturbed areas will be minimized and construction activities will be staged.
- Seeding or other stabilization measures will follow immediately after grading.
- Areas that are not to be disturbed will be clearly marked by flags, signs, etc.
- The construction superintendent will be responsible for ensuring the installation and maintenance of all erosion, sediment, and storm water control practices.
- Erosion, sediment, and storm water control structures will be installed and/or constructed before the start of any earth-disturbance activities.
- Temporary erosion, sediment, and storm water control features will remain in place until permanent vegetation is established over disturbed surfaces, as described in the re-vegetation notes on Design Drawing C-12.
- Drainage channel segregation devices should be used to divide on-base drainage channels into manageable areas; excavation should not occur in subsequent areas until the preceding area has been segregated.

3.3 Sequence of Construction

The time to perform the required construction activities is estimated to be approximately 12 months. However, the project may be conducted in phases, as determined by the Navy. The following sequence of construction assumes that all of the work will be performed in one construction period. In the event that the project is conducted in phases, area-specific erosion, sediment, and storm water controls can be constructed at the time RA activities are conducted in a specific area. The generalized sequence of construction activities are as follows. Upon approval by the Resident Officer in Charge of Construction (ROICC), sequence items may be conducted concurrently:

1. Hold pre-construction meeting with the ROICC.
2. Inspect the site prior to construction to verify existing site conditions and underground utility locations.
3. Establish horizontal and vertical control for construction. Stake the location of all areas to be excavated or disturbed prior to actual work.
4. Install perimeter controls for the construction entrance(s)/exit(s). Construct the construction entrance(s)/exit(s). Install remaining perimeter controls as indicated on Design Drawings C-6 through C-10 and additional construction entrance(s)/exit(s) if approved by the ROICC prior to any earth disturbance activities. All perimeter controls

will conform to MDEQ standards, unless otherwise specified. The perimeter controls to be installed include, but are not limited to, the following:

- > Placement of silt fencing around the construction entrance(s)/exits(s), material handling pad, decontamination pad(s), and construction lay-down, storage and staging/processing area(s).
 - > Placement of SRTs within the off-base AOC.
 - > Temporary security fence and/or gates shall be installed along the site perimeter as necessary to restrict access.
 - > Additional controls as may be required by the ROICC and/or warranted by site conditions and best construction practices.
5. Install the access road and temporary diversion along the excavation area in the off-base AOC. Install culverts and additional SRTs as indicated on Design Drawing C-8 or where appropriate subject to approval of the ROICC.
 6. Clear and grub areas for material handling pad, decontamination pad(s), and construction lay-down, storage and staging/processing area(s), unless indicated otherwise.
 7. Construct material handling pad, decontamination pad(s), and storage and staging/processing area(s).
 8. Restore channels excavated during 2002 on Sites 8B and 8C by placing 6 inches of topsoil and temporary erosion control matting (ECM) and seeding with the permanent seed mixture provided on Design Drawing C-12.
 9. Remove items identified on Design Drawings C-18 and C-19 from Site 8A and abandon the permanent monitoring wells on Site 8A and the temporary monitoring wells within the off-base AOC, as indicated on the design drawings and in the specifications.
 10. Clear but do not grub all areas where excavation will occur (i.e., off-base AOC, on-base drainage channels, and Site 8A). Only clear the areas that are scheduled for excavation during the current construction period.
 11. Excavate contaminated sediments from the off-base AOC and transport sediment to the material handling pad located on Site 8B. The Navy will collect soil and groundwater verification samples from the off-base AOC in accordance with the Verification Sampling and Analysis Plan (VSAP) (TtNUS, 2003). Verification sampling and analysis will follow visual confirmation that all contaminated material has been excavated. If verification results indicate contaminants are either completely removed or at levels less than the preliminary remediation goal (PRG) for dioxin, excavation of contaminated sediment is complete. If the initial

verification results indicate that sediment remains on site with dioxin concentrations greater than the PRG, continue excavation in accordance with the VSAP and the Navy will conduct additional verification sampling and analysis. Continue the excavation process until contaminants are removed and the PRG is achieved.

12. Upon approval by the ROICC, restore the off-base AOC area of disturbance by placing common fill as required, placing 6 inches of topsoil and revegetating using the wetland plant schedule and wetland seed mixture presented on Design Drawing C-22. Following stabilization and after approval of stabilization from the ROICC and MDEQ, remove SRTs (installed and existing) within the off-base AOC. Following the restoration of the off-base AOC remove the temporary access road to the timber used for sub grade.
13. Install required haul roads along the on-base drainage channel excavation areas. Sequentially excavate on-base sediment from the drainage channels using channel segregation devices and pumps to restrict the disturbed channel to manageable lengths. Excavate contaminated sediment from indicated drainage channels and associated culverts. Transport the sediment to the material handling pad located on Site 8B. The Navy will collect verification samples in accordance with the VSAP, and as outlined in Sequence Item 11. Restore drainage channel segments by placing 6 inches of topsoil and ECM and applying the permanent seed mixture provided on Design Drawing C-12. Restrict the number of concurrently disturbed drainage channel segments to three.
14. Excavate soil ash from piles within Site 8A and transport soil ash to the material handling pad located at Site 8B. Establish the perimeter channels and stabilize with the placement of 6 inches of topsoil and ECM and by seeding with the permanent seed mixture provided on Design Drawing C-12. Modify the existing Site 8A culverts as required and install the new culvert. Dewater the existing channels and compact the remaining soil at Site 8A, where required, to achieve a suitable sub grade for the consolidated/stabilized material.
15. Sequentially excavate sediment from the drainage channels within the boundaries of Site 8A using channel segregation devices and pumps to restrict the disturbed channel to manageable lengths. Excavate contaminated sediment from indicated drainage channels and associated culverts. Transport the sediment to the material handling pad located on Site 8B. The Navy will collect verification samples in accordance with the VSAP, and as outlined in Sequence Item 11. Restrict the number of concurrently disturbed drainage channel segments to three.

16. Consolidate contaminated off-base sediment, contaminated on-base sediment, and soil ash to achieve the desired material blend. Transport to Site 8A and spread the material blend, in lifts where required, to achieve the interim grade (12 inches below final grade). Stabilize the material blend. Compact each lift of consolidated/stabilized material in accordance with the design drawings and specifications.
17. Following the placement of the consolidated/stabilized material blend (including sediment removed from perimeter controls), install the 12-inch-thick roller-compacted concrete cap in accordance with the design drawings and specifications.
18. Following the placement of the roller-compacted concrete, remove the material handling pad, decontamination pad(s), and construction lay-down, storage and staging/processing area(s). Transport and dispose off site all required materials from these temporary features. The Navy will collect verification samples from the soil below the material handling pad and all decontamination pads in accordance with the VSAP and as outlined in Sequence Item 11.
19. Stabilize all remaining areas of disturbance with the permanent seed mixture provided on Design Drawing C-12.
20. When upstream areas and all on-base drainage channels have been stabilized and approval of stabilization has been received from the ROICC and MDEQ, remove all remaining temporary perimeter controls and all remaining on-base SRTs on Sites 8A, 8B, and 8C and from all downstream drainage channels.

3.4 Permanent Stabilization

All areas disturbed by RA activities will be stabilized with permanent seeding as soon as possible following final grading but no later than 14 calendar days after establishment of final grade (as noted on the design drawings). Permanent seeding will be done in accordance with the Planning and Design Manual for the Control of Erosion, Sediment, and Storm water (USDA, 1994) and as specified on Design Drawing C-12. The seed mixture selected is recommended for Mississippi's Southern Zone in the Mississippi SWPPP Guidance Manual for Construction Activities (OPC, 2000). The seed mixture consists of common Bermuda grass when planting occurs between March 1 and July 15 or September 1 through November 30. When planting occurs between November 30 and March 1, annual ryegrass will be mixed with the common Bermuda grass. Planting between July 15 and September 1 should be avoided. However, if grades are finalized during this period, temporary seeding can be used.

3.5 Storm water Runoff Considerations

Following completion of the RA, Site 8A will be covered with roller-compacted concrete, and the excavated channels and off-base AOC will be returned to grassed or natural conditions. Because existing conditions on Site 8A consist of stabilized soil with light vegetation and future conditions will have a roller-compacted concrete cap, pre- and post-construction runoff calculations have been prepared for Site 8A. Because remediation activities at Site 8A have been underway since the drums of HO were removed from the site in the late 1970s, pre-construction conditions will be representative of when Site 8A was used as a storage area with Portland cement-stabilized soil. The pre- and post-construction runoff calculations are provided under separate cover. Due to the inclusion of over-sized drainage channels within the limits of Site 8A, the post-construction runoff peak discharge [109 cubic feet per second (cfs)] only slightly exceeds the pre-construction runoff peak discharge (108.5 cfs). Although the post-construction runoff from Site 8A exceeds the preconstruction runoff, the widening of the downstream channels during the RA will provide adequate storage for this increased flow. Therefore, other than the proposed drainage channels on Site 8A, no permanent storm water features are required.

3.6 Site Restoration and Final Stabilization and Structural Practices

The off-base AOC will be stabilized after final grading or earthmoving activities have ceased. No temporary vegetation will be used. Instead, the area will be allowed to be flooded by seasonal precipitation cycles to transport silts and other organic material onto the fill surface. Permanent vegetation will be established at the appropriate growing season period. Vegetation will be established in the shallow drainage for stabilization. Erosion control matting will be installed along the lower 50 feet of the cover slopes, and permanent vegetation and mulch will be applied.

3.7 Post-Construction

Project-derived pollutant run-off is not expected to occur after construction operations have been completed and the site has been stabilized. Once final vegetation has developed and all remaining erosion and sediment controls have been removed, a Notice of Termination (NOT) form will be filed with the MDEQ.

4.0 MAINTENANCE OF SEDIMENT AND EROSION CONTROLS

In general, during the RA, all erosion, sediment, and storm water control measures will be checked daily and after each runoff-producing rainfall event. Any required repairs will be made immediately. The following items will be checked:

The construction entrance(s)/exit(s) will be maintained in a condition that will minimize tracking sediment onto roads, including the addition of stone or other repairs.

- The silt fence and super silt fence will be checked regularly for undermining or deterioration of the fabric. Sediment will be removed when the level of sediment deposition causes “bulging” or reaches one-half of the fabric height.
- SRTs will be checked for sediment accumulation. Sediment will be removed when it reaches one-half the original height of the SRT. Erosion caused by high-velocity flows around the edges of the SRTs will be corrected immediately.
- Immediately following the establishment of a temporary diversion, the diversion will be stabilized using the permanent or temporary seed mixture. After grass has been established, the diversion will be checked periodically to determine whether the grass is withstanding flow velocities without damage. Any damage identified will be repaired immediately and the diversion reseeded.
- The seeded areas will be checked regularly to ensure that a good stand of vegetation is maintained. Areas will be fertilized and reseeded as needed. The contractor is responsible for maintenance until formal acceptance of the RA by the ROICC.

Maintenance activities will be undertaken so that vegetation, erosion, and sediment control measures and other protective measures identified in the ESCP drawings are kept in good and effective operating condition. Maintenance needs identified by inspections or by other means will be accomplished as soon as practicable, but in no case more than seven days after the need is identified.

In addition to the practices listed above, the project will be monitored as required by this SWPPP and Best Management Practices (BMP), and the Mississippi Storm water Management and Sediment Control Handbook to ensure the maintenance and effectiveness of the erosion control measures.

5.0 INSPECTION OF EROSION AND SEDIMENT CONTROLS

The inspection schedule and documentation procedures have been designed so that vegetation, erosion, sediment control measures, and other protective measures identified in the SWPPP are kept in good and effective operating condition. This section describes the inspection schedule, project record keeping, permit reports and data, control measure repair or modification, and subsequent revision of the SWPPP.

5.1 Schedule

The following list includes, but is not limited to, areas that will be inspected by qualified personnel at least once every seven calendar days and within 24-hours of the end of a storm that is 0.5 inches or greater:

- Disturbed areas of the construction site that have not undergone final stabilization;
- Areas used for the storage of materials that are exposed to precipitation that have not undergone final stabilization;
- Structural control measures; and
- Locations of vehicle ingress and egress.

For non-compliance incidents, a report summarizing the scope of inspection, name(s) and qualifications of inspector(s), date(s) of inspection, major observations relating to the implementation of the SWPPP, and actions taken in accordance with the Permit will be retained as part of the SWPPP for at least three years after final stabilization of Site. Where reports do not identify non-compliance incidents, the report shall contain a certification of compliance with the SWPPP, signed in accordance with part VI.G of the Permit.

5.2 Retention of Records

The permit recipient will retain copies of the SWPPP and all reports as required by the Permit and records of all data used to complete the Notice of Intent for a minimum of three years from final stabilization date at the Base. The MDEQ may request an extension of the record retention period. The permittee shall retain a copy of the SWPPP required by this permit at the construction site from the date of project commencement to the date of final stabilization.

All written correspondence under this permit shall be directed to the MDEQ at the following address:

**Mississippi Department of Environmental Quality
NPDES/ND Permit Administration
Storm Water Permitting**

5.3 Repair, Modification, and Revision

Based on the results of the inspection, any inadequate control measures or control measures in disrepair will be replaced, modified, or repaired as soon as practicable (i.e., before the next rain event if possible, and in no case more than seven days after the need is identified). If the site description and pollution prevention measures in the SWPPP need to be revised based on the results of the inspection, those revisions will be completed in accordance with the Permit, but no later than 7 calendar days following the inspection identifying the need.

6.0 NON-STORM WATER DISCHARGES

This section presents a description of non-storm water discharges and pollution prevention measures that will be employed during the proposed RA.

6.1 Non-Storm water Discharges

The non-storm water discharges anticipated during construction activities will be water resulting from draining of the excavated soils, dewatering of excavations, and decontamination efforts associated with field equipment and vehicle wash waters. Water resulting from the draining of excavated soils will be containerized and tested. If a determination is made to allow the discharge of collected water, water will be pumped to sediment tanks to remove sediment and will then be pumped to a permeable area within the limits of the site where it will be discharged and allowed to infiltrate or flow to downstream reaches of the drainage channel.

Due to the presence of existing SRTs within the on-base drainage channels, water resulting from excavation dewatering will be pumped to down gradient channel segments. For the last on-base channel segment (the most down gradient segment), water resulting from excavation dewatering will be containerized and tested. If a determination is made to allow the discharge of collected water, water will be pumped to sediment tanks to remove sediment and will then be pumped to a permeable area within the limits of the site where it will be discharged and allowed to infiltrate or flow to downstream reaches of the drainage channel.

All decontamination water will be collected in a specifically designed, lined decontamination pad area and transported to an approved off-site treatment facility. All sediment will be removed from the wastewater prior to treatment.

6.2 Pollution Prevention Measures

The following is a list of materials or substances that are anticipated to be stored on site during the proposed RA:

- Detergents for decontamination efforts;
- Diesel fuel and other vehicle maintenance substances;
- Fertilizer for use as a soil amendment to promote vegetative growth; and
- Small quantities of laboratory chemicals, paints, and other flammable substances.

Detergents and small containers or drums of oil, grease, antifreeze, hydraulic fluids, etc., if any, will be stored within an enclosed, lined, and diked area and any diesel fuel will be stored in tanks. The storage area will be bermed and lined with 60 mil linear low density polyethylene (LLDPE) geo-membrane. It will be designed to contain at least 10 percent of the total contents of all materials stored in the area plus an allowance for precipitation. A small sump or low point will be designed to serve as a monitoring point for any leaks or spills from the containers.

Inspection of the area and management of substances collected in this area were addressed previously in Section 4.0. Small quantities of herbicides, laboratory chemicals, paints, and other flammable substances may be stored on site during the RA. These materials, when not in use, will be stored in a flammable storage cabinet located in the office trailer. Practices that will be followed to reduce risks associated with these materials are as follows:

- Products will be kept in original containers unless they are not re-sealable.
- Original labels and material safety data sheets will be retained.
- If surplus product must be disposed, manufacturers' or local- and State- recommended methods for proper disposal will be followed.

The following paragraphs describe specific spill prevention and material management practices that will be employed during the proposed RA.

Good Housekeeping

The following are the material management practices that will be used to reduce the risk of spills or other accidental exposure of materials and substances to storm water runoff:

- An effort will be made to store only enough products required to accomplish the task.
- All materials stored on site will be stored in a neat, orderly manner in their appropriate containers and, if possible, under a roof or other enclosure.
- Products will be kept in their original containers with the original manufacturers' labels.
- Substances will not be mixed with one another unless recommended by the manufacturer.
- Whenever possible, all of a product will be used before disposing of the container.
- Manufacturers' recommendations for proper use and disposal will be followed.
- The assigned individuals will inspect areas daily to ensure proper use and disposal of materials on site.

Spill Control Practices

In addition to the good housekeeping and material management practices discussed above, the following practices will be followed for spill prevention and cleanup:

- Manufacturers' recommended methods for spill cleanup will be clearly posted, and site personnel will be made aware of cleanup procedures and the location of the cleanup information and supplies.
- Materials and equipment necessary for spill cleanup will be kept in the material storage area on site. Equipment and materials will include but will not be limited to brooms, dust pans, mops, rags, gloves, goggles, absorbent material, and plastic and metal containers specifically designed for this purpose.
- All spills will be cleaned immediately after discovery.
- The spill area will be kept well ventilated, and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.

- Spills of toxic or hazardous material will be reported to the appropriate State or local government agency, as required.
- If a spill of toxic or hazardous material occurs, this SWPPP will be modified to include measures to prevent this type of spill from reoccurring and information about how to clean the spill if there is a recurrence. A description of the spill, what caused it, and the cleanup measures will also be included in the revised plan.
- The on-site construction superintendent responsible for day-to-day site operations will be the spill prevention and cleanup coordinator. He will designate at least three other site personnel who will receive spill prevention and cleanup training. These individuals will each become responsible for a particular phase of prevention and cleanup. The names of responsible spill personnel will be posted in the material storage areas and in the office trailers located on site.

6.3 Non-Storm water Discharges

The following non-storm water discharges have potential for occurring from the Site during the construction period:

- Groundwater may be intercepted during the construction of this project;
- Dust suppression water; and
- Water used to wash vehicles (i.e., where detergents are not used and detention and/or filtering are provided before the water leaves the Site).

6.4 Topographic Map

A portion of a U.S. Geological Survey (USGS) 7½-minute quadrangle topographic map is displayed on drawing GR-002 of the Sediment and Erosion Control Drawings. This drawing shows:

- Location of the Site;
- Location of all perennial and intermittent streams and other water bodies as shown on the USGS topographic map and or field verified; and
- Location at the receiving waters where the storm water from the Site would enter the receiving waters.

7.0 CERTIFICATIONS

The following Statement is included as certification of this SWPPP.

Contractors/Subcontractors Certification

“I certify under penalty of law that I understand the terms and conditions of the general National Pollutant Discharge Elimination System (NPDES) permit that authorizes the storm water discharges associated with construction activity at the site identified as part of this certification.”

Contractor

Company Name and Address

Signature of Responsible Person

Date

Contractor

Company Name and Address

Signature of Responsible Person

Date

Subcontractor

Company Name and Address

Signature of Responsible Person

Date

8.0 REFERENCES

Harding Lawson Associates (HLA), 2000. Remediation Planning Document, Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, Charleston, South Carolina. August.

Tetra Tech NUS, Inc. (TtNUS), 2003. Focused Feasibility Study, Site 8, Herbicide Orange Storage Area at Naval Construction Battalion Center, Gulfport, Mississippi. Prepared for Southern Division Naval Facilities Engineering Command, North Charleston, South Carolina. March.

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United States Environmental Protection Agency (USEPA), 1992. Storm Water Management for Construction Activities: Summary Guidance on Developing Pollution Prevention Plans and Best Management Practice, EPA 832-R-92-001, October.

APPENDIX A – CHECKLISTS

APPENDIX A

- A.1 USEPA CONSTRUCTION GENERAL PERMIT REQUIREMENTS
PRECONSTRUCTION CHECKLIST**
- A.2 STORMWATER POLLUTION PREVENTION PLAN
CONSTRUCTION/IMPLEMENTATION CHECKLIST**

**A.1 USEPA CONSTRUCTION GENERAL PERMIT REQUIREMENTS
PRECONSTRUCTION CHECKLIST**

**EPA CONSTRUCTION GENERAL PERMIT REQUIREMENTS
PRECONSTRUCTION CHECKLIST**

Stormwater Pollution Prevention Plans

1. A site description, including:

- The nature of the activity.

Refer to Section 1.2 of the Stormwater Pollution Prevention Plan.

- Intended sequence of major construction activities.

Refer to Section 2.3 of the Stormwater Pollution Prevention Plan.

- The total area of the site.

Refer to Section 2.1 of the Stormwater Pollution Prevention Plan.

- The area of the site that is expected to undergo excavation.

Refer to Figure 2-1 of the Stormwater Pollution Prevention Plan.

- The runoff coefficient of the site after construction is complete.

Refer to the Post-Construction Runoff Calculation provided in Appendix B of the Erosion, Sediment, and Stormwater Control Plan Report.

- Existing soil or Stormwater data.

Refer to the Pre-Construction Runoff Calculation provided in Appendix B of the Erosion, Sediment, and Stormwater Control Plan Report.

A site map with:

- Drainage patterns.

Refer to the Pre-Construction Runoff Calculation and the Post-Construction Runoff Calculation provided in Appendix B of the Erosion, Sediment, and Stormwater Control Plan Report.

- Approximate slopes after major grading.

Refer to Design Drawings C-20 through C-24.

- Area of soil disturbance.

Refer to Design Drawings C-6 through C-10.

- Outline of areas which will not be disturbed.

Refer to Design Drawings C-6 through C-10.

- Location of major structural and non-structural controls.

Refer to Design Drawings C-6 through C-10.

- Areas where stabilization practices are expected to occur.

Refer to Design Drawings C-20 through C-24.

- Surface waters.

Refer to Figures 2-1 of the Stormwater Pollution Prevention Plan.

- Stormwater discharge locations.

Refer to Figure 2-1 of the Stormwater Pollution Prevention Plan.

- The name of the receiving water(s).

Refer to Figure 2.1 of the Stormwater Pollution Prevention Plan.

2. A description of controls:

2.1 Erosion and sediment controls, including:

- Stabilization practices for all areas disturbed by construction.

Refer to Section 2.2, Section 2.2.1, and Section 2.4 of the Stormwater Pollution Prevention Plan.

- Structural practices for all drainage/discharge locations.

Refer to Section 2.2 and Section 2.2.1 of the Stormwater Pollution Prevention Plan.

2.2 Stormwater management controls, including:

- Measures used to control pollutants occurring in Stormwater discharges after construction activities are complete.

Refer to Section 2.2 and 2.4 of the Stormwater Pollution Prevention Plan.

- Velocity dissipation devices to provide nonerosive flow conditions from the discharge point along the length of any outfall channel.

Refer to Section 2.2.1 of the Stormwater Pollution Prevention Plan and Design Drawings C-6 through C-10.

2.3 Other controls including:

- Waste disposal practices which prevent discharge of solid materials to waters of the U.S.

Refer to Section 5.0 of the Stormwater Pollution Prevention Plan.

- Measures to minimize offsite tracking of sediments by construction vehicles.

Refer to Section 2.2.1 of the Stormwater Pollution Prevention Plan.

- Measures to ensure compliance with State or local waste disposal, sanitary sewer, or septic system regulations.

N/A.

- 2.4 Description of the timing during the construction when measures will be implemented.

Refer to Section 2.3 of the Stormwater Pollution Prevention Plan.

3. State or local requirements incorporated into the plans.

Refer to Sections 2.0, 2.2.1 and 3.0 of the Stormwater Pollution Prevention Plan.

4. Inspection and maintenance procedures for control measures identified in the plan.

Refer to Section 4.0 of the Stormwater Pollution Prevention Plan.

5. Identification of allowable non-Stormwater discharges and pollution prevention measures.

Refer to Section 5.0 of the Stormwater Pollution Prevention Plan.

6. Contractor certification.

Refer to Section 7.0 of the Stormwater Pollution Prevention Plan.

7. Plan certification.

Refer to Section 6.0 of the Stormwater Pollution Prevention Plan.

**A.2 STORMWATER POLLUTION PREVENTION PLAN
CONSTRUCTION/IMPLEMENTATION CHECKLIST**

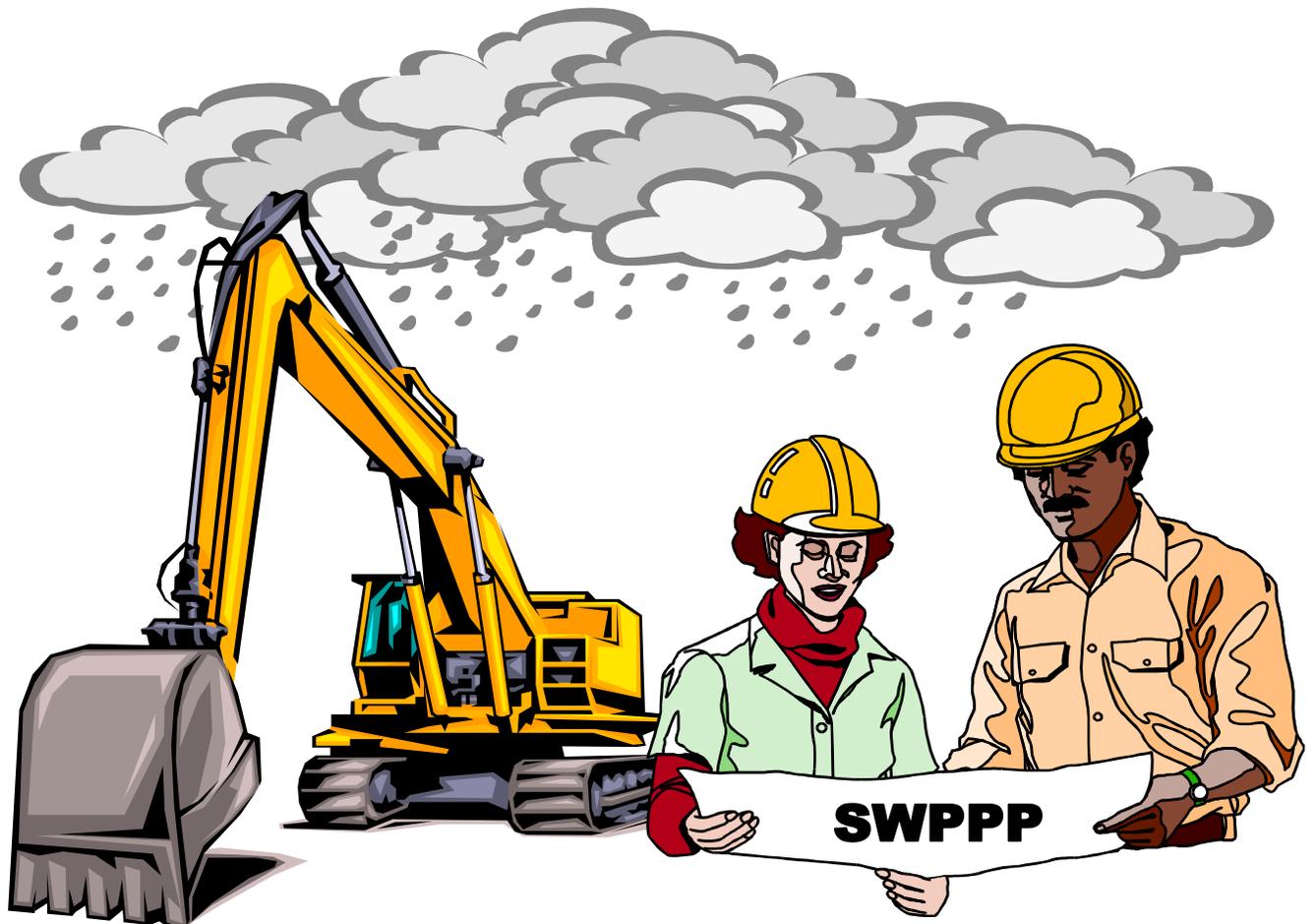
EPA CONSTRUCTION GENERAL PERMIT CHECKLIST

**Stormwater Pollution Prevention Plan
Construction/Implementation Checklist**

1. Maintain Records of Construction Activities, including:
 - Dates when major grading activities occur
 - Dates when construction activities temporarily cease on a portion of the site
 - Dates when construction activities permanently cease on a portion of the site
 - Dates when stabilization measures are initiated on the site
2. Prepare Inspection Reports summarizing:
 - Name of inspector
 - Qualifications of inspector
 - Measures/areas inspected
 - Observed conditions
 - Changes necessary to the SWPPP
3. Report Release of Reportable Quantities of Oil or Hazardous Materials (if they occur);
 - Notify National Response Center 800/424-8802 immediately
 - Notify permitting authority in writing within 14 days
 - Modify the pollution prevention plan to include:
 - The date of release
 - Circumstances leading to the release
 - Steps taken to prevent reoccurrence of the release
4. Modify Pollution Prevention Plan as necessary to:
 - Comply with minimum permit requirements when notified by EPA that the plan does not comply.
 - Address a change in design, construction, operation, or maintenance which has an effect on the potential for discharge of pollutants
 - Prevent reoccurrence of reportable quantity releases of a hazardous material or oil.

APPENDIX B – MISSISSIPPI GENERAL NPDES PERMIT INFORMATION

MISSISSIPPI
STORM WATER POLLUTION
PREVENTION PLAN (SWPPP)
GUIDANCE MANUAL
FOR CONSTRUCTION
ACTIVITIES



*General Permits Branch
Office of Pollution Control
Department of Environmental Quality
P. O. Box 10385
Jackson, Mississippi 39289-0385
March 2000*

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This manual is primarily derived from Chapters 2, 3 and 4 of EPA's AStorm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, © September 1992, and Chapters 3, 4 and 5 of The Mississippi Department of Environmental Quality, Mississippi Soil & Water Conservation Commission and USDA Soil Conservation Service's APlanning & Design Manual for the Control of Erosion, Sediment & Stormwater, © April 1994. It was originally edited by Mississippi Office of Pollution Control staff Kenneth LaFleur and Louis Lavallee, and most recently by Jim Morris, Kenneth LaFleur, and Adam Smith, who thank those who reviewed and commented on the draft. See our web site for more StormWater information at www.deq.state.ms.us.

INTRODUCTION

This booklet is a guide for developing a **Storm Water Pollution Prevention Plan (SWPPP)** for the Mississippi Department of Environmental Quality (MDEQ) as required in the State of Mississippi's Construction Storm Water General NPDES Permit. The permit should be consulted for complete requirements. For a more thorough description of erosion and sediment controls, see **Planning & Design Manual for the Control of Erosion, Sediment & Stormwater**,[@] MDEQ, MSSWCC, U. S. Dept. of Agriculture NRCS, Jackson, MS, 1994. This manual may be purchased from MDEQ by completing the form found on page 21. The manual is also available electronically at <http://abe.msstate.edu/csd/p-dm/>.

This guide is organized according to the six parts of SWPPP planning and implementation: **(PART I) collect site information, (PART II) choose controls, (PART III) draft SWPPP, (PART IV) apply for permit coverage, (PART V) implement controls, and (PART VI) stabilize site and terminate coverage.**

Always consider the following items in developing a SWPPP:

- **Disturb** the smallest area possible. Also, when you disturb large areas that have high erosion potential, the cost of erosion and sediment controls greatly increase.
- **Preserve** existing vegetation where possible, especially trees.
- **Avoid** disturbing sensitive areas such as:
 - Steep and/or unstable slopes.
 - Land upslope of surface waters.
 - Areas with erodible soils.
 - Existing drainage channels.
- **Divert** upslope water around disturbed areas.
- **Limit** exposure of disturbed areas to the shortest time possible.
- **Re-vegetate** disturbed areas as soon as possible.
- **Slow rainfall runoff velocities** to prevent erosive flows.
- **Remove sediment from storm water before it leaves the site** by allowing runoff to pond in controlled areas to drop out sediment. Filter runoff by using natural vegetation, brush barriers, silt fences or hay bales.
- **Transport runoff** down steep slopes through lined channels or piping.
- **Minimize** the amount of cut and fill.

PART I

COLLECT SITE INFORMATION

- **Existing soils information** - Are the soils susceptible to erosion? For information see the Natural Resources Conservation Service (NRCS) soil surveys or call the District Conservationist through the State Office in Jackson at 601/965-5196 or 5205. The NRCS is the former Soil Conservation Service.
- **Receiving water(s)** - Identify the lake, stream, pond or wetland that will receive site runoff. If sensitive water bodies are downstream (for example: wild and scenic rivers, recreational streams, natural aquatic sites, private ponds and lakes or receiving streams listed on the 303(d) list) extra erosion controls may be needed. A discussion of the 303(d) list follows. For assistance, see the appropriate USGS Quad map(s), a photocopy of which must be submitted with the SWPPP. For USGS Quad maps contact the MS Office of Geology at 601/961-5523.

- **List of Impaired Water bodies (Pursuant to Section 303(d) of the Clean Water Act)** - Mississippi's waters are used for public water supply, shell fish harvesting, recreation, and fishing & aquatic life support. MDEQ assesses State waters every two years to determine if their uses are supported. A water body is said to be impaired when its use is partially or non-supportive. Construction sites, whose receiving streams are on the list of impaired waters because of siltation, suspended solids, sediment, turbidity or habitat alterations, require additional erosion and sediment controls. These additional controls are intended to ensure that sediment will not enter impaired waters. For more information concerning 303(d) listed streams, please contact the Water Quality Assessment Branch of the MDEQ at 601-961-5171.
- **U. S. Army Corps of Engineers** - If your project is rerouting, filling or crossing a water conveyance of any kind, you should contact the U. S. Army Corps of Engineers, Regulatory Branch in your area for possible permitting requirements. For information call the Vicksburg District at 601/631-5289 or 5290 or the Mobile District at 334/694-3776.
- **Calculating total acreage disturbed** - This includes the total area disturbed over the course of the project. For subdivisions include roads, utilities, drainage and home sites. A minimum of 10,000 ft² per home site or the entire lot, if smaller, shall be included. Acreage may be determined by dividing square footage by 43,560, as demonstrated in the following example:

Convert 54,450 ft² to acres *(square footage is obtained by multiplying the length of the disturbed area by the width of the disturbed area)*

 - Divide 54,450 ft² by 43,560 square feet per acre:
 - $54,450 \text{ ft}^2 \div 43,560 \text{ ft}^2/\text{acre} = 1.25 \text{ acres.}$
- **Determine drainage areas** for each point where concentrated flow will leave the site. Drainage areas are portions of the site where runoff will flow in one particular direction or to a particular discharge point. This will help you select and design the appropriate sediment control. The USGS Quad map(s) may be useful.

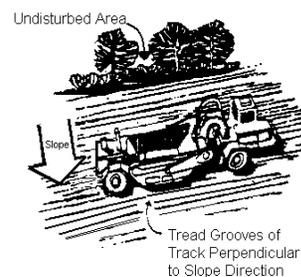
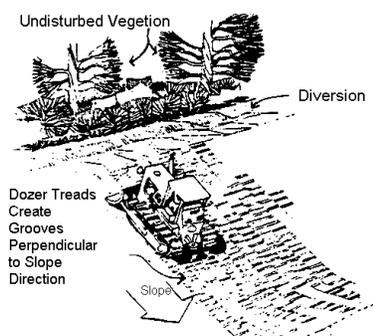
PART II

CHOOSE CONTROLS

Select vegetative and structural controls; housekeeping practices; and post construction/storm water management measures & controls to be used prior to, during and after land disturbing activities. Also, language in deeds, covenants, etc., that require sediment and erosion controls for individual lots in residential subdivisions is required. The SWPPP must include a description of the measures and controls that will be used throughout the construction project. Incorporate any municipal, county or other required controls into your SWPPP.

1. **Vegetative Controls** Vegetation is an inexpensive and effective way to protect soil from raindrop impact, a major erosion force. It also decreases erosion from flowing water by reducing its velocity. Roots hold soil and increase infiltration. **Topsoil should be added where existing soils are not suitable for adequate vegetative growth.** Amendments may include composted manures, sawdust or sludge. Check with the Mississippi Department of Environmental Quality, Solid Waste Branch, at 601-961-5171 before using sewage sludge.
 - **Vegetative buffer zones** are undisturbed or planted vegetated areas that surround a development, land disturbance activity or that border an intermittent stream or permanent water body. Buffer zones aid in sediment filtration and removal. Construction site runoff should be spread out over entire buffer zone length if possible. A minimum 15-foot wide buffer zone is recommended. A minimum 150-foot buffer zone is recommended adjacent to perennial streams and water bodies.

- **Sod stabilization**, the most effective vegetative practice available, involves establishing long-term stands of grass with sod on exposed surfaces. When installed and maintained properly, sodding can be more than 99 percent effective in reducing erosion.
- **Protection of trees** involves preserving and protecting selected trees that exist on the site prior to development. Mature trees provide extensive canopy and root systems that hold soil in place. Shade trees also keep soils from drying rapidly and becoming susceptible to erosion, as well as increasing property value.
- **Tillage, with lime and fertilizer**, may be important before seeding. The local county agent with the Cooperative Extension Service can analyze soil for lime and fertilizer needs.
- **Temporary seeding** is the planting of fast-growing annual grasses to hold the soil in areas that will not be disturbed again for 30 or more days. For long term protection (greater than one year), permanent seeding should be initiated. The following seeding chart lists annuals that may be used. Mulching helps insure seed growth and is essential when slopes are steep, weather is hot or dry and soil conditions are poor.
- **Permanent seeding** is the use of perennial grass (with trees & shrubs) to stabilize the soil. The seeding chart lists perennials that may be used. Vegetation is often not fully established until one year from planting. Inspect, repair and re-seed as needed, evaluating choice of seed and quantities of lime and fertilizer. Use temporary seeding if the time of year is not appropriate for permanent seeding. **Sodding may be needed in highly erodible areas.**
- **Mulching** is the placement of hay, grass, wood chips, straw, or synthetic material on the soil. Mulch holds moisture, dampens temperature extremes and retards erosion on steep slopes during seed establishment. Soils that cannot be seeded due to the season should be mulched to provide temporary protection.
- **Erosion & Sediment Control Blankets** are machine-produced mats of straw or other fibers held together with netting that provide temporary or permanent stabilization in critical areas, such as slopes or channels, so that vegetation may be established.
- **Surface roughening**, using heavy equipment, creates horizontal grooves across the slope which reduce runoff velocity/erosion and aid the growth of seed. Roughened slopes should be immediately seeded and mulched.



SEEDING CHART FOR THE STATE OF MISSISSIPPI

SPECIES	SEEDING RATE/ACRE	PLANTING TIME	DESIRED pH RANGE	FERTILIZATION RATE/ACRE	METHOD OF ESTABLISHMENT	ZONE OF ADAPTABILITY ¹
Common Bermuda	15 lbs. alone 10 lbs. mixture	3/1 - 7/15 9/1 - 11/30	6.0 - 7.0	600 lbs. 13-13-13	seed or sod	All
Bahia	40 lbs. alone 30 lbs. mixture	3/1 - 7/15 9/1 - 11/30	6.0 - 7.0	600 lbs. 13-13-13	seed	Central South
Fescue	40 lbs. alone 30 lbs. mixture	9/1 - 11/30	6.0 - 7.0	600 lbs. 13-13-13	seed	North Central
Saint Augustine	--	3/1 - 7/15	6.0 - 7.0	600 lbs. 13-13-13	sod only	Central South
Centipede	4 lbs. alone 2.5 lbs. mix	3/1 - 7/15	6.0 - 7.0	600 lbs. 13-13-13	seed or sod	All
Carpet Grass	15 lbs. alone 10 lbs. mixture	3/1 - 7/15	6.0 - 7.0	600 lbs. 13-13-13	seed or sod	All
Oysia Grass	--	3/1 - 7/15	6.0 - 7.0	600 lbs. 13-13-13	sod only	All
Creeping Red Fescue	30 lbs. alone 22.5 lbs. mix	9/1 - 11/30	6.0 - 7.0	600 lbs. 13-13-13	seed	All
Weeping Lovegrass	10 lbs. alone 5 lbs. mix	3/1 - 7/15	6.0 - 7.0	600 lbs. 13-13-13	seed	All
*Wheat	90 lbs. alone	9/1 - 11/30	6.0 - 7.0	600 lbs. 13-13-13	seed	All
*Ryegrass	30 lbs.	9/1 - 11/30	6.0 - 7.0	600 lbs. 13-13-13	seed	All
*White Clover	5 lbs.	9/1 - 11/30	6.0 - 7.0	400 lbs. 6-24-24	seed	All
*Crimson Clover	25 lbs. alone 15 lbs. mix	9/1 - 11/30	6.0 - 7.0	400 lbs. 6-24-24	seed	All
Sericea Lespedeza	40 lbs.	3/1 - 7/15 9/1 - 11/30	6.0 - 7.0	400 lbs. 6-24-24	seed	All
*Hairy Vetch	30 lbs.	9/1 - 11/30	6.0 - 7.0	400 lbs. 6-24-24	seed	All
*Browntop Millet	40 lbs. alone 15 lbs. mix	4/1 - 8/30	6.0 - 7.0	600 lbs. 13-13-13	seed	All

* Annuals. For permanent seeding, annuals can only be used in a mixture with perennials.

¹**North-** north of Hwy. 82, **Central-** south of Hwy. 82 & north of Hwy. 84. **South-** South of Hwy. 84

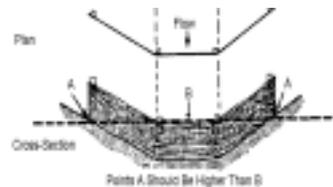
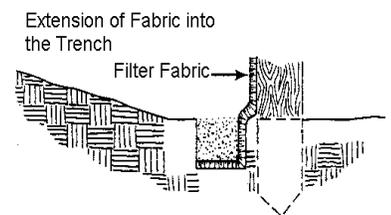
2. **Structural Controls** divert flows away from disturbed areas, reduce runoff velocities, filter out sediment and remove sediment by ponding.

Temporary structures are installed before and during construction. After removing temporary storm water controls the area should be vegetated. **Permanent structures** remain after construction.

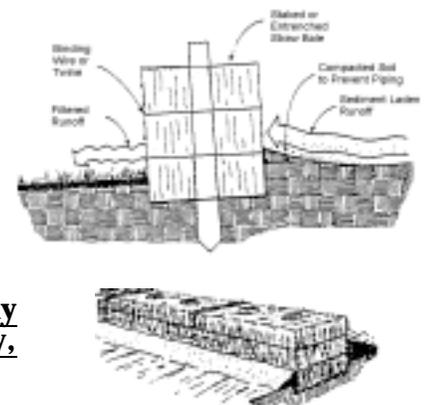
- **Diversion** ridges/channels of stabilized soil can divert off-site runoff from disturbed areas or sediment-laden runoff into sediment basins. If diversions will remain in place more than 30 days they should be covered with temporary or permanent vegetation. Diversions must have enough grade to assure drainage, but not enough to cause erosion within the channel. Allow sufficient room around diversions to permit machine regrading, if needed. The maximum allowable drainage area is five acres.



- **Silt fences** are used below small disturbed areas to capture sediment from sheet flow. Eight inches of fence should be buried in a trench about four inches deep and four inches wide. **Silt fences that are not buried are improperly installed, have no useful function, are a waste of money, and could result in substantial fines.** The maximum slope length behind a fence is 100 feet with maximum gradient two horizontal to one vertical. Under no circumstances should silt fences be installed across flowing streams. They may be placed in minor swales or ditch lines where the maximum contributing drainage area is no more than two acres. The fence must be maintained and sediment removed when deposits reach one-half the fence height. After the fence is no longer needed, the area should be graded, seeded and mulched.



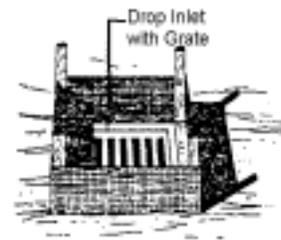
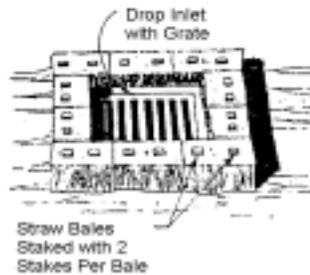
- **Straw bale barriers** are also used on small disturbed areas to capture sediment from sheet flow. The drainage area must be restricted to 1/8 acre per 100 feet of barrier. Maximum gradient behind the barrier is three horizontal to one vertical. The barrier must be located so that the water depth does not exceed one foot at any point. Straw bales, with bindings oriented around the sides, shall be entrenched a minimum of four inches and anchored with two stakes driven toward the previously laid bale. **Straw bales that are not buried are improperly installed, have no useful function, are a waste of money, and could result in substantial fines.**



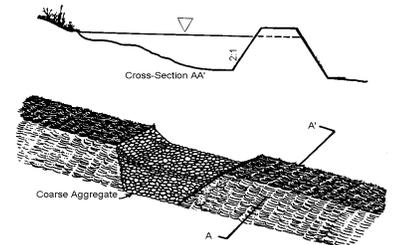
Gaps between bales shall be wedged with straw. Loose straw scattered immediately uphill increases barrier efficiency. Under no circumstances should straw bale barriers be constructed in live streams. For minor dry swales, the end bale bottoms shall be higher than the middle bale top to assure runoff will not flow around the barrier. Repair damaged bales, end runs and undercutting. Remove sediment when it reaches one-half barrier height. When upslope areas are stabilized, remove bales and grade, seed and mulch barrier line.



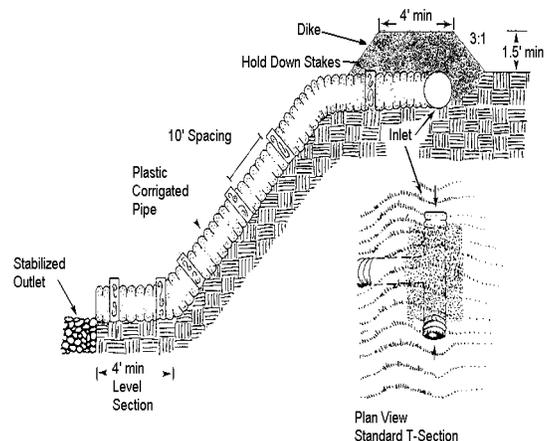
- **Storm Drain Inlet Protection** is a sediment filter (aggregate, silt fence, straw bales) or an excavated sediment trap around a storm drain inlet. Storm sewers installed before their drainage area is stabilized can convey large amounts of sediment to streams. Straw bale and silt fence inlet protection is for drainage areas of less than one acre and slopes no greater than 5 percent.



- **Sediment basins** allow sediment to settle out. Sediment basins are made by diking, excavating or a combination of the two. The Planning and Design manual recommends a basin capacity of 134 yd³ per acre drainage area. Because of typical basin shapes and embankment side slope requirements of 2:1 or flatter, the capacity of the basin may be estimated by using the trapezoidal rule approximation of 40% x height x surface area. Sediment should be removed when the volume has been reduced to 27yd³ per acre drainage area. The length should be twice the width, with maximum surface area and outlet as far from the inlet as possible. If using a dike, it must be well compacted and vegetated, with an outlet pipe or coarse aggregate spillway. Install basins prior to construction but not in flowing streams. Use diversions to direct drainage to basins. Mississippi's Construction Storm Water General Permit requires that a sediment basin be installed in any drainage location where more than 10 acres in the upstream basin are disturbed at one time. See Planning and Design manual for design details.



- **Slope drains** are piping or lined channels carrying storm water downslope without erosion. Runoff is directed to the drain by earthen diversion with a minimum height of 18 inches. At the inlet, the diversion and inlet cover must be 6 inches higher than the top of the piping. The diversion and especially the inlet cover must be well compacted. Install



pipng hold-downs at 10-foot intervals and line the outlet area with riprap or other material to prevent scour and undermining. The maximum drainage area per drain should be five acres. Permanent slope drains would be subsurface or paved flumes.

SIZE OF SLOPE DRAIN

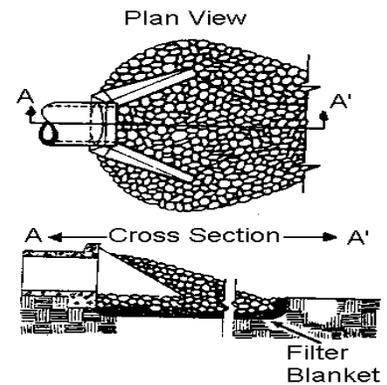
<u>Maximum Drainage Area (Acres)</u>	<u>Piping Diameter (Inches)</u>
0.5	12
0.75	15
1.5	18
2.5	21
3.5	24
5.0	30

- **Slope breaks**, diversions or benches, are used to reduce the slope length of a cut or fill to minimize rill erosion and prevent gullyng. Drainage area should be less than one acre.



	<u>Slopes</u>	<u>Slope Breaks</u>	<u>Spacing (ft)</u>
Steep Slopes	2:1		20
	3:1		35
	4:1		45
Gradual Slopes	15 - 25%		50
	10 - 15%		80
	6 - 10%		125
	3 - 6%		200
	< 3%		300

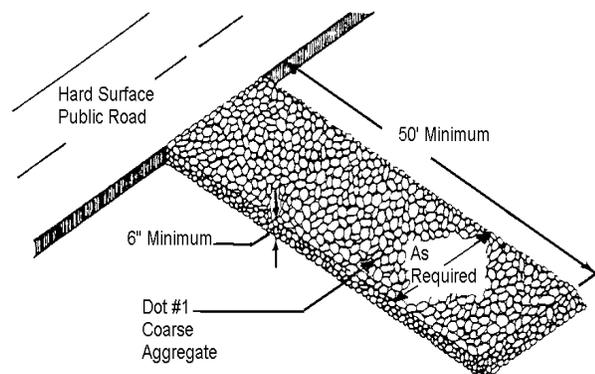
- **Riprap outlet protection** is placed at the outlet end of culverts or channels to reduce the depth, velocity and energy of water so that the flow will not erode the receiving downstream reach.



- **Check dams** are small dams constructed across swales or drainage ditches to reduce flow velocity and erosion. They are not used in streams. Check dams can be constructed of stone, straw bales, or logs, with a maximum height of two feet. **The check dam center must be at least 6 inches lower than the outer edges to prevent erosion around the edges.** The maximum spacing between dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam. Accumulated sediment should be removed from behind the check dams when it reaches one half the dam height. Erosion around dam edges should be corrected immediately, insuring that the dam center is six inches lower than the edges. In grass-lined ditches, grass must be established prior to dam removal. The dam site should be seeded and mulched or sodded, as needed. This practice is limited to small open channels that drain 10 acres or less.



- **Construction entrance/exits** are stone stabilized site entrances which reduce sediment tracked onto public roads. Aggregate should be at least six inches thick and 50 feet long. Tire washing may also be needed.



- **Level spreaders** are diversion outlets allowing the flow to disperse uniformly over surrounding vegetated areas. Spreaders should be constructed on undisturbed soil with downstream areas having established vegetation. Used to divert upslope waters around disturbed areas.



- 3. Controls for individual lots in subdivisions and commercial developments.** The Construction General Permit requires language that requires builders/lot owners to prevent or mitigate sediment from leaving their lot. The following is example SWPPP language that includes lot purchase contract language:

After the general contractor has completed the construction of the improvements necessary for a subdivision development on this property, the developer will be required to carry forward all erosion controls measures set forth in the plan to ensure builders and/or new owners within the proposed subdivision will take measures to prevent or mitigate sediment from leaving individual lots. The developer will be required to present to the new lot owner of builder in writing the parts of the SWPPP that will be appropriate for their lot. The developer will be required to set the following condition on the builder or new lot owner:

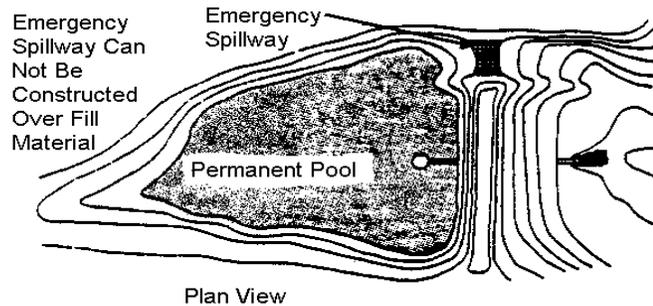
The Purchaser shall be required to maintain property in such a condition as to minimize off-site damage from erosion, sediment deposits and storm water. This requirement will be in effect from the beginning of site preparation and continued through the establishment of permanent vegetative cover. Purchaser acknowledges and agrees that Seller is not responsible for damages which may be suffered by Purchaser or other property owners or parties as a result of site preparation work carried out by Purchaser and his/her subcontractors and Purchaser agrees to hold Seller harmless from any such damages sustained in connection therewith.

- 4. Housekeeping Practices.** Pollutants that may enter storm water from construction sites because of poor housekeeping include oils, grease, paints, gasoline, solvents, litter, debris, and sanitary waste. The SWPPP should:

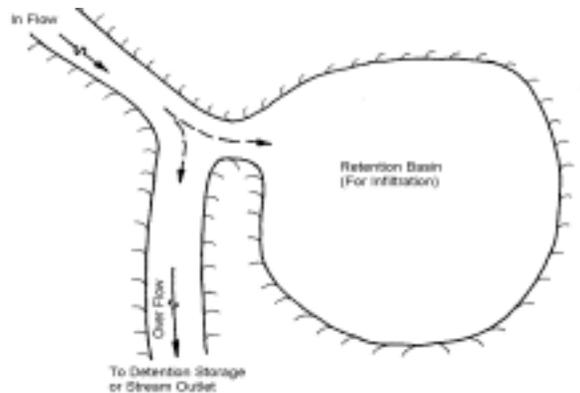
- designate areas for equipment maintenance and repair;
- provide waste receptacles at convenient locations and provide regular collection of waste;
- provide protected storage areas for chemicals, paints, solvents, fertilizers, and other potentially toxic materials; and
- provide adequately maintained sanitary facilities.

5. **Post Construction/Storm Water Management Measures.** The Construction General Permit requires the SWPPP to describe measures that will be installed to control pollutants in storm water after construction is complete. These controls include, but are not limited to, one or more of the following:

- **Detention ponds** detain runoff in a basin for a limited time releasing it slowly, allowing most of the sediment to drop out.



- **Retention Ponds** provides complete onsite storage and treatment of a specific volume of storm water runoff by using infiltration and evaporation. The specific volume is typically the first inch or half inch of storm water runoff containing the first flush of pollutants.



- **Constructed wetlands** are modified natural or constructed shallow basins for treatment of waters by wetland vegetation. Constructed wetlands are operated wet. They can achieve a high removal rate of sediments, BOD, organic nutrients and metals. They can also create wildlife habitat, recreation, and landscape amenities as well as corresponding higher property values.
- **Vegetated swales and natural depressions** are grass-lined, filtering sediments from the runoff and preventing erosion. Vegetated swales should have side slopes of 4:1 or flatter.

- **Velocity dissipation devices** prevent erosion from high runoff velocity, such as **riprap** placed at the discharge point.
- **Exfiltration trenches** are a feasible option where soils are permeable and the water table is well below the surface. Exfiltration trenches retain storm water for release into the soil. Storm water runoff is temporarily stored in perforated pipe or coarse aggregate and allowed to infiltrate the trench walls and, to some extent, trench bottoms. Trenches require regular maintenance to prevent clogs.

PART III

PREPARE SWPPP

- 1. Write a Description of Controls.** Once you have finished selecting the vegetative and structural controls, list each control you plan to use.
- 2. Prepare a scaled site map** showing original and proposed contour lines, drainage ways, north arrow, and all erosion & vegetative and structural sediment controls (see the attached sample SWPPP and site plan).
- 3. Implementation Sequence.** Indicate the order in which activities will take place. When work is discontinued for 30 days or more in a disturbed area or completed, appropriate vegetative and structural practices must be initiated within seven calendar days. Several general implementation principles are:
 - **install** downslope and perimeter controls before other site work. Build sediment basins before major site grading.
 - **divert** upslope water around area before major site grading.
 - **do not disturb** an area until it is necessary.
 - **time** construction activities to limit impact from seasonal weather.
 - **cover or stabilize** disturbed areas as soon as possible.
 - **do not remove** temporary controls until after site stabilization.
- 4. Inspection and Maintenance Schedules.** A description of an inspection and maintenance schedule for all disturbed areas, material storage areas, and erosion and sediment controls that were identified as part of the plan shall be included in the SWPPP. Non-functioning controls shall be repaired, replaced or supplemented with functional controls within 24 hours of discovery or as soon as field conditions allow. During permit coverage all erosion controls must be inspected at least once per week and after heavy rain. Controls must be in good operating condition until the area they protect has been completely stabilized and the construction activity is complete.

PART IV

APPLY FOR PERMIT COVERAGE

Submit a Construction Notice of Intent (**CNOI**) to the Office of Pollution Control (OPC) along with the **SWPPP** and the **USGS Quad Map** (or copy). The CNOI summarizes information about you, your site, the prime contractor, and receiving water(s). The CNOI is due at least 30 days prior to the commencement of construction or 15 days if an approved applicable SWPPP is already on file with OPC. An **authorized representative**, as described in the general permit, must sign the CNOI. If the owner signs the CNOI and will not serve as the prime contractor, the prime contractor should sign and submit the Prime Contractors Certification form provided in the CNOI prior to actual construction.

The plan must be in compliance with applicable local storm water management, erosion and sediment control requirements.

PART V

IMPLEMENT CONTROLS

Erosion and sediment controls shall be constructed and the stabilization measures shall be applied in the order that was indicated in the implementation sequence. It is important that appropriate construction workers are aware of the SWPPP and have ready access to it. The owner or prime contractor must **inspect and maintain** controls, recording damages or deficiencies and corrective measures, and **complete monthly inspection reports** using the form provided in Part VII of the permit. Problems should be corrected within 24 hours or as soon as practicable after an inspection. Changes to correct deficiencies in the SWPPP should also be made as soon as practicable after the inspection. The SWPPP must accurately reflect the site and construction and be corrected if it does not. The Storm Water Construction General Permit requires the coverage recipient to display proof of coverage. This requires displaying the permit coverage number, project contact name, project contact phone number, project description, SWPPP location (only necessary if the site is inactive or does not have an on-site location to store the plan) and MDEQ-s phone number (601/961-5171) at a conspicuous place accessible by the public on or at the edge of the construction site. The Construction General Storm Water Permit provides a form for this purpose. The form which provides this information must be laminated.

PART VI

STABILIZE SITE & TERMINATE COVERAGE

Upon successful completion of all permanent erosion and sediment controls, the Office of Pollution Control must be notified by submission of a Notice of Termination (NOT) form. The NOT form must be fully completed by both the owner and operator and include original signatures by both parties. The NOT form is provided in Part VII of the Storm Water Construction General Permit. Monthly inspection forms must be attached to the NOT form or permit coverage cannot be terminated. If the entire NOT form is fully completed and all inspection forms are attached, a letter will be sent to both owner and operator stating the permit has been terminated. At this point, the permittees are relieved of their responsibility.

SAMPLE STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Site Information

The construction of two commercial buildings and associated pavements will disturb 7.2 acres. Three-fourths of this site has a medium erosion hazard. The remainder of the site has 10 to 20 percent slopes that are highly erodible. An intermittent drain on the north end of the property drains the site to AAny-Name@ Creek. AAny-Name@ Creek stream is not on the 303(d) list for siltation, turbidity or habitat alterations, therefore additional controls that are warranted for a site discharging to listed receiving streams are not required.

Controls

Vegetative Controls: A 15-foot undisturbed vegetative buffer zone will be maintained around the perimeter of the site. Existing trees will be preserved where possible. All diversions will be seeded (permanent seeding) within seven calendar days of construction. Topsoil will be stockpiled for use in landscaping. Grass-lined waterways will be constructed and lined with temporary straw-net liners and will be constructed around both buildings. All 3:1 cut slopes will be roughened by disking prior to seeding. The slope on the south side of the intermittent stream will be sodded with Bermuda grass. Any disturbed areas that will be left undisturbed for thirty or more days will be seeded (temporary seeding) within seven calendar days. After final grading, all disturbed areas will be seeded (permanent seeding) within seven calendar days.

Structural Controls: A sediment basin will be constructed at the end of the existing intermittent drainage to the north (drainage area: 4.8 acres). A sediment basin will be constructed at the southwest corner of the property where runoff leaves the property. Storm water will be directed to these basins with the assistance of diversions and grassed waterways. Upslope waters will be diverted around disturbed areas. A level spreader will serve as the outlet for the diversion southeast of the buildings. All cut slopes will be at or below a 3:1 grade. A construction entrance will be built and any accumulation of mud on vehicle tires will be washed, if needed, during muddy conditions. Inlet protection (silt fences) will be installed at all storm drain inlets. A silt fence will be constructed around the stockpile. The eroding natural drainage way on the north end of the site will be lined with rip rap (which is covered by a Nationwide Permit # 13 - *an individual 404 Permit is not required because the activity is less than 500 linear feet and has less than 1 cubic yard of rip rap per linear foot - no notification of Corps required.*). Riprap will be placed at all culvert outlet aprons. A sediment pond will be excavated for concrete trucks to wash the mixer chutes and a memo will be sent to the concrete supplier to use a minimum amount of water. Drivers will be instructed to return any materials to the concrete batch plant and complete final washing procedures at that location.

Housekeeping Practices. All equipment maintenance and repair will be done offsite. Trash cans will be placed at convenient locations throughout the site. The main trash collection bin will be located on the northeast corner of the site and will be picked up weekly by the city. Paints, solvents, fertilizers, or any other potentially toxic materials will not be stored onsite. Portable sanitary facilities will be provided for construction workers.

Post Construction/Storm Water Management Measures: The temporary sediment basin will be converted to a detention basin after construction. Riprap will be placed at concentrated storm water discharge points to prevent erosion from high runoff velocities.

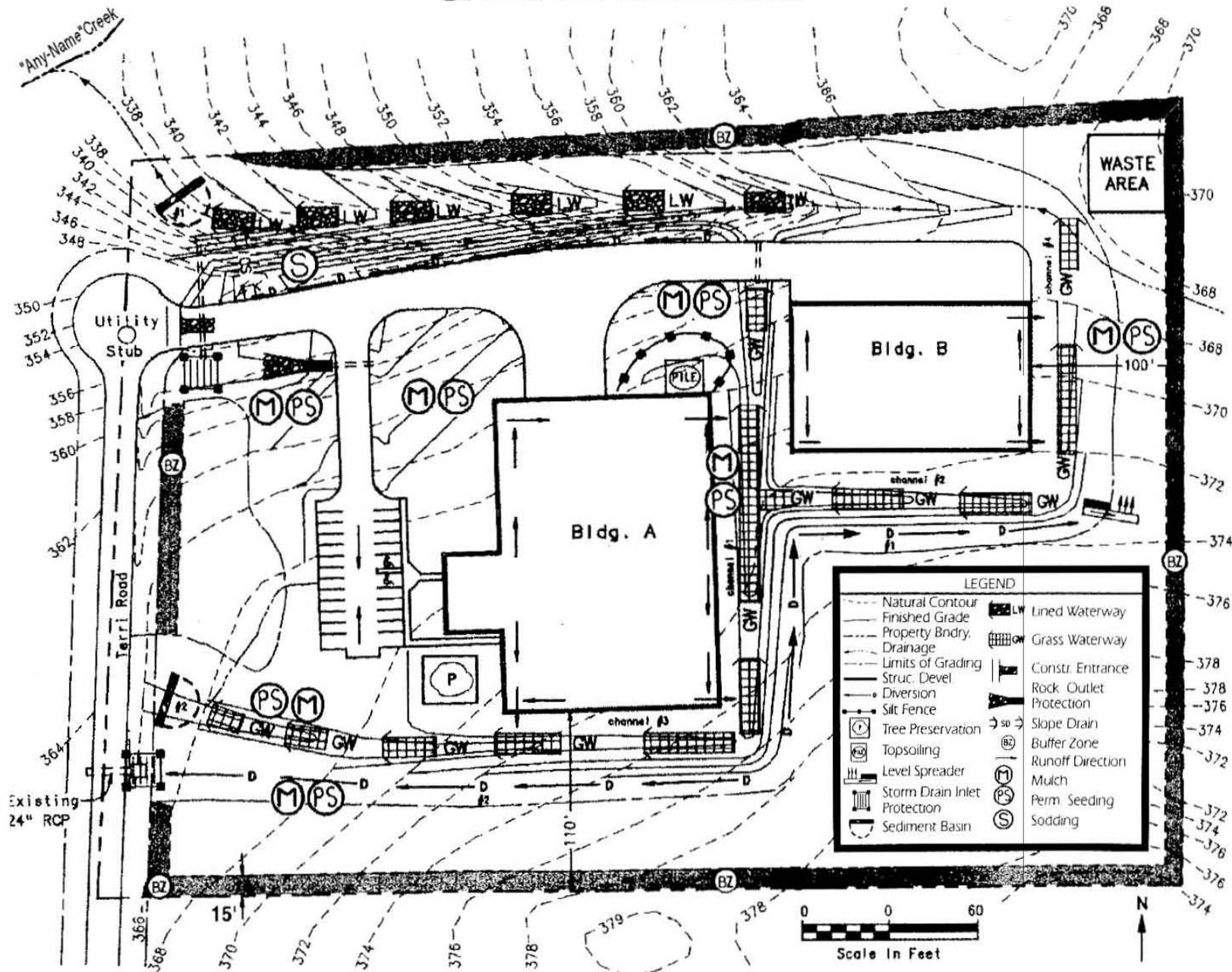
Implementation Sequence

1/ build construction entrance/exit. 2/ install sediment basin with needed riprap. 3/ contour and riprap intermittent drainage way to the north. 4/ rough grade site, construct diversions and drainage ways, stockpile topsoil and install silt fence around stockpile, install culverts with inlet/outlet protection (silt fence), level spreader and riprap. 5/ plant needed temporary vegetation on disturbed areas. 6/ construct buildings and parking lots. 7/ finish slopes around buildings, roughen slopes and vegetate. 8/ after site is stabilized, remove all temporary measures, vegetating these areas, and convert sediment basin to a detention basin.

Maintenance Plan

Check all disturbed areas, erosion and sediment controls after each significant rainfall but not less than once per week. Make needed repairs within 24 hours. Remove sediment from the basin, inlet protection devices and silt fences when accumulated sediment has reached 50 percent capacity. Replace non-functional silt fence. Maintain all vegetated areas to provide proper ground cover - reseed, fertilize, and mulch as needed.

SAMPLE SITE MAP



Worksheet 1 - Checklist Sheet for Erosion and Sediment Controls

To aid in choosing all needed controls, check off practices to be used. Describe in SWPPP and show locations on site map.

STRUCTURAL PRACTICES

- | | |
|---|---|
| <input type="checkbox"/> Check Dam | <input type="checkbox"/> Construction Entrance/Exit |
| <input type="checkbox"/> Diversion | <input type="checkbox"/> Storm Drain Inlet Protection |
| <input type="checkbox"/> Level Spreader | <input type="checkbox"/> Lined Waterway |
| <input type="checkbox"/> Slope Drains | <input type="checkbox"/> Rip-Rap Outlet Protection |
| <input type="checkbox"/> Sediment Basin | <input type="checkbox"/> Silt Fence |
| <input type="checkbox"/> Slope Breaks | <input type="checkbox"/> Straw Bale Barrier |
| <input type="checkbox"/> Other Controls _____ | |

VEGETATIVE PRACTICES

- | | |
|---|--|
| <input type="checkbox"/> Mulching | <input type="checkbox"/> Permanent Seeding |
| <input type="checkbox"/> Protection of Trees | <input type="checkbox"/> Surface Roughening |
| <input type="checkbox"/> Sod Stabilization | <input type="checkbox"/> Temporary Seeding |
| <input type="checkbox"/> Tree Preservation | <input type="checkbox"/> Tillage, with Lime and Fertilizer |
| <input type="checkbox"/> Vegetative Buffer Strips | |
| <input type="checkbox"/> Other Controls _____ | |

CONTROLS FOR INDIVIDUAL LOTS IN SUBDIVISIONS

- | | |
|--|--|
| <input type="checkbox"/> Subdivision Covenants | <input type="checkbox"/> Lot Purchase Contract |
| <input type="checkbox"/> Local Ordinance | <input type="checkbox"/> Architectural Review Requirements |
| <input type="checkbox"/> Other Controls _____ | |

HOUSEKEEPING PRACTICES

- | | |
|---|--|
| <input type="checkbox"/> Areas for maintenance and repair | <input type="checkbox"/> Waste receptacles |
| <input type="checkbox"/> Storage for toxic materials | <input type="checkbox"/> Sanitary facilities |
| <input type="checkbox"/> Other Controls _____ | |

POST CONSTRUCTION CONTROL MEASURES

- | | |
|--|---|
| <input type="checkbox"/> Detention Basin | <input type="checkbox"/> Retention Pond |
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Velocity Dissipation Devices |
| <input type="checkbox"/> Vegetated Swales
and Natural Depressions | |
| <input type="checkbox"/> Other Controls _____ | |

FREQUENTLY ASKED QUESTIONS

Q. Is there a fee for CNOI applications?

A. No. DEQ's general permits do not require a fee at this time.

Q. If a construction operation disturbing five or more acres is owned by a small municipality (a population of less than 100,000 people) but operated by a private contractor, is the activity regulated?

A. No. If the construction activity is either owned or operated by a municipality with a population of less than 100,000 it would not be required to obtain a storm water permit during Phase 1 of the storm water program because of a temporary exemption. This exemption will end, however, on March 10, 2003.

Q. If a project will not be completed before this permit expires, how can I keep permit coverage?

A. If the permit is reissued or replaced with a new one before the current one expires, you will need to comply with whatever conditions the new permit requires in order to transition coverage from the old permit. This usually includes submitting a new CNOI. If the permit expires before a replacement permit can be issued, the permit will be administratively continued.

Q. What is a SWPPP?

A. This acronym stands for Storm Water Pollution Prevention Plan. For construction activities, it is a plan which describes appropriate practices which will reduce or mitigate sediment from leaving the construction site - An erosion and sediment control plan.

Q. Where can I get assistance?

A. If you don't have the expertise - hire an engineer or consultants who specialize in erosion and sediment control. Private land owners may go to the Natural Resource Conservation Service (NRCS).

Q. How do I terminate a project?

A. When the site is stabilized, one must notify MDEQ by submitting the Notice of Termination (NOT) form found in Part VII of the Construction General Permit. The NOT form must be signed by the owner of the land and the contractor. Monthly inspection forms must be attached to the NOT or permit coverage cannot be terminated.

Q. What is the threshold of land disturbance that will require me to obtain storm water permit coverage?

A. Phase I storm water regulations require five acres or more of clearing, grading or excavating obtain storm water coverage.

Q. I have heard rumors that this acreage threshold will be reduced to one acre, is this true?

A. Yes, when Phase II of the storm water regulations are implemented (March 2003) one acre or more of land disturbance will be the new threshold.

Q. For projects such as a 100-mile highway construction project, what location should be provided on the CNOI?

A. The beginning of a linear construction project should be used as the location on DEQ's CNOI Form.

- Q. Is clearing of lands specifically for agricultural purposes regulated construction activity (40 CFR 122.26(b)(14)(x)) under the storm water program?**
- A. No. Although the clearing of land may be greater than five acres, any amount of clearing for agricultural purposes is not considered an industrial activity under the storm water regulations. Section 402(l)(1) of the 1987 Water Quality Act exempts agricultural storm water discharges from NPDES permitting requirements including storm water permitting. This exemption only applies, however, if the clearing of land is solely for agricultural purposes.
- Q. If a construction activity that disturbs less than five acres occurs at a regulated industrial activity currently covered by the State's industrial storm water permit, does the regulated industry have to modify its pollution prevention plan to include controls for the area of construction?**
- A. Yes. Regulated industrial activities covered by Mississippi's storm water industrial general permits must revise their pollution prevention plan to address all new sources of pollution and runoff including those from construction activities disturbing less than five acres, that occurred on the site of the regulated industry. However, if less than five acres, a separate storm water permit for the construction activity is not required. If the disturbance is five acres or greater then the facility should submit a CNOI for coverage under the State's construction storm water general permit.
- Q. For a construction activity that uses off site borrow pits for excavation of fill material or sand and gravel, should the number of disturbed acres at the borrow pit be added to the number of acres at the construction site to determine the total number of disturbed acres?**
- A. No, off site borrow pits are not considered part of the on site construction activity. If a borrow pit is specifically used for the removal of materials such as sand, gravel, and clay, the pit is considered a mine and is classified under SIC code 14. Such sites would be regulated as industrial activity as defined at 40 CFR 122.26(b)(14)(iii). However, if the borrow pit is utilized for the removal of general fill material (e.g. dirt) and disturbs five or more acres of land, the pit would be considered a construction activity as defined at 40 CFR 122.26(b)(14)(x).
- Q. What is meant by a larger common plan of development or sale?**
- A. A larger common plan of development or sale is a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under one plan. For example, if a developer buys a 20-acre lot and builds roads, installs pipes, and runs electricity with the intention of construction homes or other structures sometime in the future, this would be considered a common plan of development or sale. If the land is parceled off or sold, and construction occurs on plots that are less than five acres by separate, independent builders, this activity still would be subject to storm water permitting requirements if the smaller plots were included on the original site plan.
- Q. Am I required to notify the public of my construction activities?**
- A. Yes. The Construction Storm Water General Permit requires the display of permit and SWPPP information at a conspicuous place accessible by the public on or at the edge of the construction site. A sample information form can be found in the Construction General Permit.
- Q. Who must apply for permit coverage for construction activities?**
- A. Under the NPDES storm water program, the operator of a regulated activity or discharge must apply for storm water permit coverage. The operator of a construction activity is the party or parties that either individually or taken together meet the following two criteria: (1) they have operational control over the site specifications (including the ability to make modifications in specifications); and (2) they have the day-to-day operational control of those activities at the site necessary to ensure compliance with plan requirements and permit conditions (9/9/92 Federal Register page 41190). Usually the owner of the project initially files the CNOI and the contractor would complete and submit the A prime contractor form when selected.

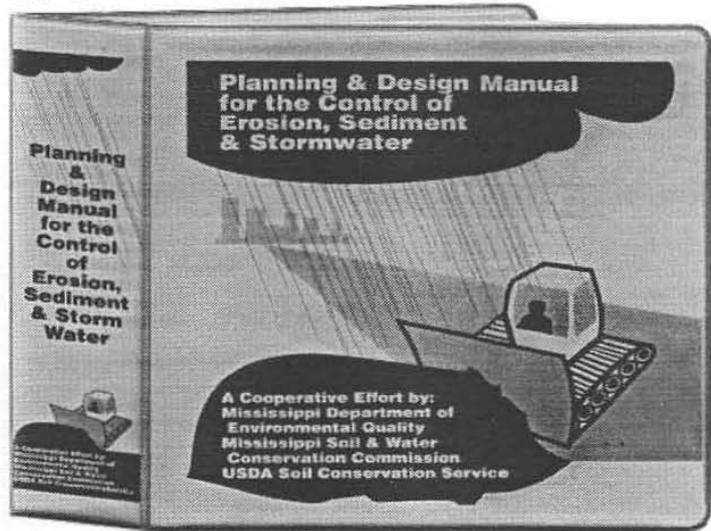
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