Remedial Action Construction Summary Report

Sediment Cap Completion
(August 2005 through October 2005)

McCormick & Baxter Creosoting Company
Portland, Oregon

May 2006

Task Order No. 71-03-21

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DEQ
State of Oregon
Department of
Environmental
Quality

ecology and environment, inc.

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Prepared for:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
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List of Abbreviations and Acronyms

Acronym	Definition
AAD	Advanced American Diving Service, Inc.
AAC	Advanced American Construction, Inc.
ACB	articulated concrete block
AINW	Archeological Investigations Northwest, Inc.
BAA	biological assessment addendum
BNSF	Burlington Northern Santa Fe
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COP	construction operations plan
CQAP	construction quality assurance plan
DAS	Oregon Department of Administrative Services
DEA	David Evans & Associates, Inc.
DEQ	Oregon Department of Environmental Quality
DSL	Oregon Department of State Lands
E & E	Ecology and Environment, Inc.
EMRP	environmental monitoring and reporting plan
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
ESD	Explanation of Significant Difference
GPS	global positioning system
ITB	Invitation to Bid
McCormick & Baxter	McCormick & Baxter Creosoting Company, Portland Plant
NAPL	nonaqueous phase liquid
NGVD	National Geodetic Vertical Datum
NOAA Fisheries	National Oceanic and Atmospheric Administration National Marine Fisheries Service

List of Abbreviations and Acronyms (Cont.)

Acronym	Definition
NPDES	National Pollutant Discharge Elimination System
OAR	Oregon Administrative Rules
ORS	Oregon Revised Statutes
OSHA	Occupational Safety and Health Administration
OWRD	Oregon Water Resources Department
PacRim	PacRim Geotechnical, Inc.
PCP	pentachlorophenol
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RA	remedial action
RD	remedial design
ROD	Record of Decision
TFA	Tank Farm Area
USACE	United States Army Corps of Engineers
WQMP	water quality monitoring plan

1 Introduction

Ecology and Environment, Inc. (E & E), under contract with the Oregon Department of Environmental Quality (DEQ), has prepared this remedial action (RA) construction summary report addendum to document remedial actions implemented to address contaminated sediment at the McCormick & Baxter Creosoting Company, Portland Plant (McCormick & Baxter) Superfund Site in Portland, Oregon (Figure 1-1). This project is managed by DEQ under a cooperative agreement with the United States Environmental Protection Agency (EPA).

This document has been prepared under DEQ-E&E Task Order No. 71-03-21, an extension of DEQ Task Order No. 71-03-14, which concerns implementation of remedial design/remedial action (RD/RA) activities at the site in accordance with the remedy described in the Record of Decision (ROD; EPA 1996), the March 1998 ROD Amendment (EPA 1998) and the August 2002 Explanation of Significant Difference (EPA 2002). The RA addressed by this document consists of the completion of the sediment cap, which was identified in the ROD as the selected sediment remedy (subsection 1.2).

1.1 Site Location and Description

Located on the east bank of the Willamette River near River Mile 7, the site encompasses approximately 41 acres on land and 23 acres in the river, which includes impacted sediment beyond the legal property boundaries. The site is situated downstream of Swan Island and upstream of St. John's Bridge. The upland portion is on a terrace of imported sand fill (dredged material placed in the early 1900s) within the floodplain of the Willamette River. The upland area is generally flat and lies between a 120-foot-high bluff along its northeastern border and a 20-foot-high bank along the Willamette River to the southwest. A sandy beach is exposed at the base of the bank except during periods of high river stage, which generally occurs during late winter or early spring.

The site is bordered by vacant industrial properties on the river and by a residential area on the bluff. Multiple Burlington Northern Santa Fe (BNSF) Railroad tracks on an embankment create the northwestern boundary of the site. The embankment extends to a railroad bridge crossing the Willamette River. A portion of this bridge is within the sediment capping area. Additionally, the

Union Pacific Railroad borders the site to the northeast at the base of the bluff. An Oregon Department of State Lands (DSL) easement crosses through the in-water portion of the site; the legally recorded DSL easement is included as an appendix to E & E's *Sediment Cap Construction Summary Report* (E & E 2006c). The entire perimeter of the upland McCormick & Baxter site is fenced, and warning signs are posted on the fences.

The property is accessed via the partially paved North Edgewater Street, which leads from Willamette Boulevard to the main gate near the northern corner of the site. The driveway leading into the property and the support facility area are paved; the remainder of the property is unpaved or vegetated. A shop building, two trailers and a hazardous waste storage area are maintained in the support facility area to provide office space and storage for ongoing site activities. The remaining aboveground structures on site include: a variety of material stockpiles, including articulated concrete block (ACB) mat storage, a concrete utility bunker containing water line backflow prevention valves, and several utility poles. All other aboveground structures and buildings were removed during previous RA activities.

1.2 Site Background and ROD Requirements

McCormick & Baxter was founded in the early 1940s to produce a variety of treated wood products during World War II. Various wood treatment processes were used at the site including pentachlorophenol (PCP), creosote formulations, ammoniacal copper/zinc arsenate, a copper/chromium/arsenic formulation, and Cellon. Site investigation between 1983 and 1990 revealed many releases of chemical compounds to soil, groundwater, and sediment. Contaminants detected at the site include polynuclear aromatic hydrocarbons (comprising about 85% of creosote constituents), PCP, arsenic, chromium, copper, and zinc. In 1990, the wood treatment operations ceased and early removal actions were initiated to remove process equipment, piping, tanks, treatment formulations, and other items.

The ROD identifies selected remedies for contaminated soil, groundwater, and sediment. Over the past several years, a number of inspections, investigations, and RAs have been performed at the site. Phase I of the soil remedy was performed in 1999, where the most highly contaminated soil was excavated to four feet below ground surface and disposed of off site as hazardous waste. Clean, sandy fill was placed in those areas that were excavated. Phase II of the soil remedy was performed in 2005, which entailed the installation of a soil cap over the entire upland portion of the site.

Groundwater remedies included extracting and treating groundwater (implemented in 1994 and suspended in September 2000) and the installation of a vertical barrier wall in 2003 to reduce off-site migration of groundwater contaminated with nonaqueous phase liquid (NAPL). Groundwater/NAPL extraction has occurred since 1994, first as an automated process, then transitioning to manual methods in 1998 when NAPL recovery diminished. Ongoing monitoring ensures that site-specific alternate concentration limits are met at compliance monitoring locations.

The remedy for sediment, as specified in the ROD, entailed the installation of a sediment cap over contaminated sediment and the initiation of long-term monitoring, operation and maintenance, and institutional controls. The objectives for the remedy included preventing humans and aquatic organisms from having direct contact with contaminated sediment and minimizing releases of contaminants from sediment that might result in contamination of the Willamette River in excess of federal and state ambient water quality criteria.

The RD for the sediment cap was prepared by E & E with input from the entire project team consisting of DEQ, EPA, United States Army Corps of Engineers (USACE), various Native American tribes[1], the National Oceanic and Atmospheric Administration (NOAA) and NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS). Significant design issues included determination of the river current and wave energy for design events, the effectiveness of the capping material in sequestering the contamination, identification of a capping material for NAPL seeps, minimizing the amount of material placed to address floodway issues, armoring for the riverine environment, and upland bank modifications for stability to eliminate the need for further work below ordinary high water.

A biological assessment (EPA 2002) was developed for the McCormick and Baxter site prior to construction of the subsurface vertical barrier wall in 2003. An addendum to the biological assessment (EPA 2003a) for construction of the sediment cap was submitted by the EPA to NOAA Fisheries and the United States Fish and Wildlife Service in October 2003. A biological opinion (NOAA Fisheries 2004), pursuant to Section 7 of the Endangered Species Act (ESA), was issued by NOAA Fisheries in March 2004. The EPA performed a substantive compliance determination for the Clean Water Act Section 401 and Section 404 (EPA 2003b and EPA 2003c). Section 401 regulates discharge into waters of the United States through a Certification issued by DEQ. Section 404 regulates the placement of dredged and fill material into waters of the United States through a permit issued by the USACE. Under Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) authority, EPA is exempt from the

[1] Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Grand Ronde Community, Confederated Tribes of Siletz Indians, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, and the Nez Perce Tribe.

administrative and procedural aspects of permits but must comply with the substantive requirements of the regulations.

In December 2003, E & E completed the initial contract documents for the construction of the sediment cap, which included contract requirements, technical specifications, and drawings. Thereafter, the DEQ, with assistance from the Oregon Department of Administrative Services (DAS), solicited bids for construction of the sediment cap. On March 9, 2004, the contract was awarded to Remtech, Inc. (Remtech), of Spokane, Washington. Notice to Proceed was issued on March 11, 2004. Construction preparations including meetings and submittal reviews were performed thereafter, but actual construction did not commence until late June 2004 in accordance with the biological opinion (NOAA Fisheries 2004), which limited in-water work to the "fish window" of July 1 to October 31, 2004. On-site construction concluded in November 2004.

During sediment cap construction, two City of Portland pressurized sewer lines were found exposed within the sediment capping area. The sewer lines were discovered during debris identification dive surveys near the start of construction. According to the City of Portland, the sewer lines were supposed to be buried approximately 10 feet below the river bottom. E & E and DEQ directed the contractor to halt all construction activities near the sewer lines. The City of Portland was informed of the situation. A no-work zone was established by E & E and DEQ. Although only a small portion of the pipes were exposed, the no-work zone extended beyond the exposed portion to the deep water edge, due to concerns related to differential settling if the overburden load was increased. Also, no information was available on the depth of the sewer lines below the bottom of the river. The no-work zone continued up the bank and covered an approximate 120-foot swath of the sewer lines.

The City of Portland stabilized the exposed sewer lines in July 2005 in order for DEQ to complete the sediment cap. In June 2005, E & E completed the initial contract documents for the completion of the sediment cap, including contract requirements, technical specifications, and drawings. On May 28, 2005, DEQ was declared exempt from the competitive bidding requirements of Oregon Revised Statute (ORS) 279C.375(1) and related sections of ORS 279 and the Oregon Administrative Rules (OAR's) in selecting the construction contractor for the sediment cap completion work (Appendix A). This exemption was issued in consideration of significant schedule constraints and anticipated cost savings in using the same contractor that the City of Portland used to stabilize the exposed sewer lines. On August 2, 2005, the contract was awarded to Advanced American Diving Service, Inc. (AAD), doing business as Advanced American Construction, Inc. (AAC), of Oregon City, Oregon. Notice to Proceed was issued on August 3, 2005. Construction commenced on August 9, 2005 and concluded on September 14, 2005. Change Order work included the performance of diver inspections of the previously capped area, collection of sand cores and water samples, placement of additional armoring and installation of organoclay

mats underneath the BNSF railroad bridge. Wilder Construction Company, under an existing contract with DEQ, also installed organoclay mats along the shoreline west of the Tank Farm Area (TFA). All in-water construction was completed in accordance with the Sediment Cap biological opinion (NOAA Fisheries 2004), which limited in-water work to the "fish window" of July 1 to October 31.

1.3 Report Objectives and Organization

The purpose of this report is to:

- Provide a summary of the sediment cap completion activities performed by E & E and AAC, including descriptions of construction methods and quantities of materials installed;
- Explain modifications made during the RA activities to the original RA contract documents, including a discussion of why changes were made;
- Present a chronology of major events;
- Present a summary of biological and pollution control monitoring activities;
- Describe community relations;
- Present photographic documentation; and
- Document RA construction quantities and costs.

Record drawings of the sediment cap are provided in Appendix B. The results of sediment cap inspections following 2004 construction, and repairs to the sediment cap, some of which were performed by AAC under Change Orders, are included in Appendix C.

This report has been prepared in accordance with a slightly modified version of the Sediment Cap Construction Quality Assurance Plan (CQAP) that was submitted by E & E to DEQ in August 2005, for the Sediment Cap Completion work. The organization of this report is as follows:

- Section 2 provides details of the RA implementation including contracting and subcontracting; a summary of pre-construction and construction activities; issues, corrective actions, and project deviations; oversight and monitoring activities (i.e., environmental monitoring); health and safety; community relations; documentation (e.g., photographic documentation and record drawings); and a chronology of major events;
- Section 3 documents RA construction quantities and costs; and
- Section 4 lists the references used in this report.

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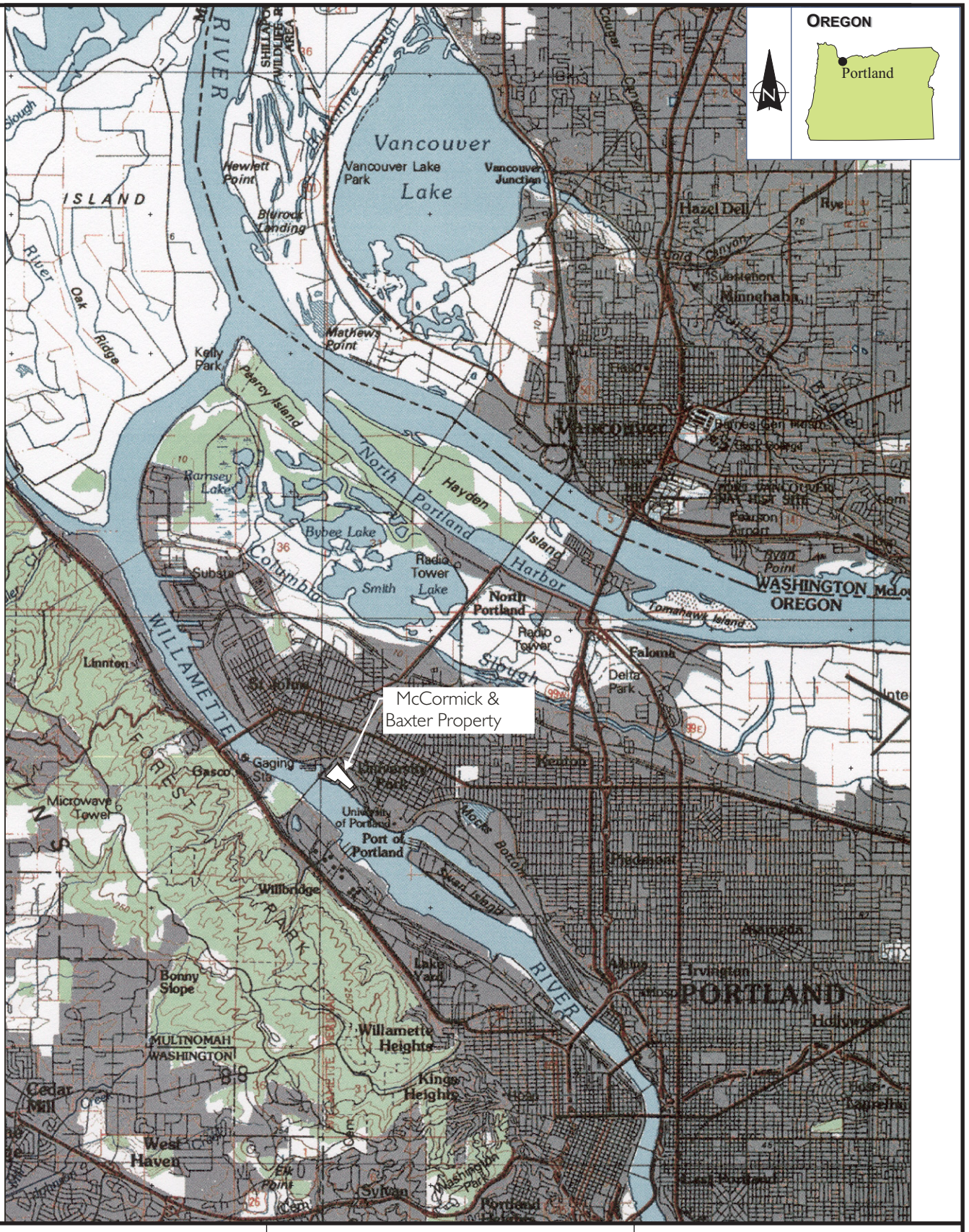

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

McCORMICK AND BAXTER
CREOSOTING COMPANY SITE
Portland, Oregon

Figure 1-1

SITE LOCATION MAP

Date:
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2 Remedial Action Implementation

2.1 Contracting and Subcontracting

E & E, under contract with DEQ, provided environmental engineering and consulting services to implement RD/RA activities including oversight of RAs and the remedial contractors. Activities were conducted in accordance with the ROD, amended ROD, Explanation of Significant Difference (ESD), and DEQ task orders. E & E was responsible for preparation of work plans, implementation of field investigation activities, preparation of data summary documents, and preparation of the engineering designs and specifications related to remediation activities. E & E also provided assistance to DEQ regarding preparation of the contract documents required for procurement of the RA construction contractors.

For the RA construction phase of the project, E & E provided construction oversight services and technical management assistance to DEQ. In this role, E & E assisted DEQ with public relations, project data management, reporting and documentation, resolution of technical issues, and approval of technical submittals. During the RA, E & E provided oversight engineers to monitor contractor performance and compliance with the contract requirements, conduct inspections, and document work progress and modifications. In addition, E & E utilized an on-site biological monitor to oversee implementation of the environmental monitoring plan.

E & E subcontracted the following:

- West Coast Marine Cleaning of Portland, Oregon, to provide boom deployment services when necessary;
- Pacrim Geotechnical Inc. of Portland, Oregon, to provide a visual inspection of sediment cap materials including sand, gravel filter, 6-inch minus rock and riprap.

DEQ awarded the sediment cap completion contract to AAC. AAC and their subcontractors were responsible for the physical implementation of the fieldwork specified in the contract documents. AAC was DEQ's prime contractor for the project. As the prime contractor, AAC provided physical labor and operations management for the project. AAC also provided project management of the subcontractors and material/equipment vendors that were required to complete

construction of the sediment cap. Subcontractor and vendor lists are provided below.

Subcontractors:

- David Evans & Associates, Inc. (DEA), of Portland, Oregon, provided surveying services.
- County Line Excavation, of Beavercreek, Oregon, provided an excavator and operator to assist with sediment cap material placement from the barge.

Vendors:

- CETCO of Lovell, Wyoming, supplied organoclay mat for placement over areas where sheen bursts were observed after 2004 sediment cap construction.
- Morse Bros., Inc. of Portland, Oregon, supplied sediment capping materials including sand, gravel filter and 6-inch minus rock.
- Westside Rock of Hillsboro, Oregon, supplied riprap for sediment cap armoring.

2.2 Pre-Construction Activities

This subsection summarizes the pre-construction activities performed including meetings, submittal preparation, and permitting.

2.2.1 Previous Sediment Cap Contract

As described in the *Sediment Cap Construction Summary Report* (E & E 2006c), during sediment cap construction in the summer of 2004, it was discovered that City of Portland high pressure sewer lines were exposed above the top of the river bed within the sediment cap footprint. After consulting with the City and the major stakeholders, the sediment cap construction contract was modified by change order to exclude construction adjacent to the sewer lines where they protruded above the river bed and further down slope to the edge of the cap.

2.2.2 City of Portland Actions

Based on data provided by the City of Portland to DEQ at the time of (original) sediment cap design, two high-pressure sewer lines belonging to the City crossed the area where sediment cap construction was to occur. These two high-pressure sewer lines were expected to run underneath the river sediments. During the course of the sediment cap construction in 2004, DEQ discovered that these high-pressure sewer lines were exposed above the river bottom. The exposed sewer lines created a major environmental and public safety threat, and compromised DEQ's ability to construct the sediment cap in the area of the exposed sewer lines.

DEQ advised the City of Portland in August 2004 that the sewer lines were exposed and, with the concurrence of the City, DEQ advised its sediment cap construction contractor to halt sediment cap construction activities in the areas adjacent to the sewer lines alignment.

During the fall of 2004 and the winter and spring of 2005, the City of Portland investigated the conditions at the sewer lines and, in coordination with DEQ and E & E, designed a remedy.

Because of the significant threats to human health and the environment posed by the exposed high-pressure sewer lines, the City of Portland initiated its procurement process based on the Emergency Procurement rules in the City of Portland City Code Section 5.33.130. Under authority granted by the City of Portland Mayor, the City proceeded to request prequalification documents from eight potential contractors - some of whom were plan holders for the original DEQ sediment cap Invitation to Bid (ITB), and determined that five of the contractors who submitted prequalification documents were qualified to bid on the work. The City subsequently issued its ITB which required bids be submitted by June 8, 2005. The City awarded its construction contract for the sewer line repairs to Advanced American Construction, Inc. The City's construction contractor mobilized in early July and completed all City contracted work by the first of August. The City of Portland's record drawings for the sewer line repairs are provided in Appendix D.

2.2.3 Pre-Construction Meetings

Prior to construction activities associated with the DEQ contract, a required pre-construction meeting and several additional meetings were held between E & E's design engineer and AAC to discuss the construction operations prior to the pre-construction meeting.

On August 8, 2005, a pre-construction meeting was held. Attendees included DEQ's project manager and contract officer; E & E's project manager, project engineer, and senior engineer; and AAC's key project personnel including the managing principal, the project manager, and the project engineer. Topics presented and discussed during the meeting included staff introductions, a construction activity overview, project roles and responsibilities, construction schedule, submittal requirements, and change order management.

The meeting also covered construction operations. The discussion points included:

1. River current with respect to construction.
2. Sand placement.
3. Interim verification of in-water placement.
4. Turbidity.
5. National Pollutant Discharge Elimination System (NPDES) permit.

6. Utilities and traffic: Information required for transmittal to various agencies.
7. Lines of communication.
8. Submittal review procedures.

2.2.4 Submittals

Per Section 01300 of the contract documents for sediment cap completion (E & E 2005c), AAC and their subcontractors and/or vendors were required to prepare submittals including plans (e.g., COP, health and safety plan, etc.), shop drawings, and product data on materials and equipment. Appendix E contains product data received as submittals for the major components used in completion of the sediment cap. Other product data obtained outside of the formal submittal process are included in Appendix F.

2.2.5 Regulatory Compliance

Substantive compliance with regulations prescribed under the ESA was required due to the potential of sediment cap construction activities impacting federally listed salmonid species (e.g., chinook salmon) in the Willamette River. Since AAC's work was a continuation of the originally planned sediment cap construction, documentation from sediment cap construction in 2004 was carried over to sediment cap completion work in 2005. In 2004, The USACE, with assistance from E & E, developed a biological assessment addendum (BAA) to update the biological assessment that had been submitted for barrier wall work. Submitted on behalf of the EPA, the BAA triggered the issuance by NOAA Fisheries of an updated biological opinion (NOAA Fisheries 2004). Two additional BAAs were submitted after the contractor's construction methods were known. The first one (E & E 2004f) discussed importation of topsoil for the 2005 upland cap and the second (E & E 2004b) addressed towing pilings to the shore, operating equipment in shallow water, and grouting underwater ACB seams. The biological opinion determined that the sediment capping project was not likely to jeopardize ESA species but mandated that reasonable and prudent measures be taken during construction. The biological opinion also reiterated that the habitat enhancement features of the design, such as returning the shoreline to a more natural condition, must be implemented.

E & E developed an environmental monitoring and reporting plan (EMRP) that was slightly modified from the Sediment Cap EMRP, to be used by field oversight personnel to implement conservation measures prescribed in the biological opinion. The EMRP is included as an appendix to E & E's CQAP (E & E 2004e). See section 2.7 for additional details associated with the development and implementation of these plans.

In preparation for sediment cap construction in 2004, the USACE prepared the Clean Water Act Section 401 substantive regulatory determination (EPA 2003b) for signature by the EPA. The 401 determination described measures to be taken during construction to mitigate impacts to water quality and provided the

procedures to follow for notification and record keeping with respect to water quality issues. Since AAC's work was a continuation of the originally planned sediment cap construction, the 2004 Clean Water Act Section 401 substantive determination was carried over to sediment cap completion in 2005.

The USACE also prepared a Clean Water Act Section 404 substantive regulatory determination (EPA 2003c) for signature by the EPA which determined that the project complied with the substantive elements of the cited regulations. This substantive determination also was carried over to the sediment cap completion in 2005.

2.3 Construction Activities

Construction activities during the sediment cap implementation consisted of the following major components:

- General Mobilization and Site Preparation.
- Sediment Cap Completion:
  - Sand,
  - Armoring.
- Organoclay Mat Placement.
- Demobilization.

Equipment used during construction included a Manitowoc Vicon 4100W crane mounted on a barge, material barge, tugboat, John Deere 544H loader, Case 9020B excavator, clamshell bucket, skip box and a CETCO organoclay mat spreader bar.

The following subsections describe in detail each of the above-listed activities that were performed during the completion of the sediment cap.

2.3.1 General Mobilization and Site Preparation

AAC anchored a barge at the site and performed all work with water-based equipment. No mobilization occurred at the site on land.

2.3.2 Sediment Cap Completion

The area that was capped around the sewer lines encompassed approximately 61,010 square-feet just upstream of the BNSF railroad bridge, where material placement was avoided during sediment cap construction in 2004 due to the discovery of exposed high-pressure sewer lines. Approximately 6,777 square-foot within this area was determined to require additional material in order to flatten steep slopes. An additional area that was capped encompassed approximately 4,414 square- foot over the hot-spot that was previously capped, however, it was determined to require additional material. Based on the results of inspections performed by AAC divers, DEQ directed AAC to provide additional armoring at several locations within the 2004 sediment cap footprint. The most

significant of these repairs was to a 6,100 square-foot area upstream of the sewer lines where divers found the six-inch rock armoring to be missing (Appendix C).

Installation control for all types of material for the cap were based on the estimated volume of material required per unit area (grid). The general equations used by AAC to estimate the necessary volumes were as follows:

1. [Grid Area (square feet) x Design Thickness of the Material (feet)] / 27 ft^3 = Volume (cubic yards)
2. Volume (cubic yards) x Density (tons/cubic yard) = Number of Tons Required in the Grid Area

AAC developed a grid system to cover the sediment cap completion area with average grid cell dimensions of 50 feet by 50 feet. Due to the non-rectangular dimension of the overall work area, many grid areas were smaller. Using the equations above, and knowing the approximate quantity of material that the clamshell bucket and skip box could hold, AAC calculated the number of bucket or box loads of material required to achieve the material design thickness in each grid cell. AAC's crane operator guided each bucket or skip box of material into place using a global positioning system (GPS) unit that had one of three antennas at the end of the crane boom. A computer monitor in the crane cab gave a real-time display of the grid and the clamshell bucket or skip box position, ensuring that each bucket or box load of material was released in a pattern that evenly covered the area receiving the material.

AAC normally utilized a 3-man crew including one crane operator and two deckhands. AAC's QC engineer was also on-site daily, and the site superintendent was on-site occasionally.

The following subsections describe the sediment cap completion construction in detail.

2.3.2.1 Sand

Sand was placed on the Willamette River bottom and along the shore at a thickness of 2 feet. As presented in the sediment cap basis for design (E & E 2002), modeling determined that this thickness protected human health and the environment. There are two types of areas in which this minimum thickness requirement varies: the hot-spot area and the slope flattening areas. The hot-spot area was required to have a thickness of 5 feet of sand. The sediment cap completion area includes an approximate 4,414 square-foot area over the hot-spot that was previously capped, however, it was determined to require an additional 2 feet of material. The slope flattening areas were required to have the minimum of 2 feet plus the additional sand sufficient to grade the slopes to an average of 2.5 Horizontal to 1 Vertical (2.5H:1V). The sediment cap completion area includes an approximate 6,777 square-foot area that was determined to require additional material in order to flatten steep slopes. This subsection describes the sand

imported for the cap, the equipment, the installation methods, and quality control (QC) utilized during construction.

Materials and Equipment

The source of the sand was the same as during sediment cap construction in 2004: an existing stockpile of Columbia River Navigational Channel maintenance dredge spoils. The USACE dredged the sand from the Upper Martin Island Bar, which is located on the Port of St. Helens property between Columbia River Miles 80 and 85 and centered on River Mile 82.8. The site is formally known as Disposal Site Upper Martin Island Bar, O-82.8. The sand was supplied to AAC by Morse Bros., Inc., and was imported via barge by AAC. The sand is primarily medium to coarse grained with low organic carbon and few fines. Gradation testing of the sand (American Society for Testing and Materials D422) shows the sand to be poorly graded with over 80% falling within the size range of United States Standard Sieve Sizes 10 and 100.

Equipment used during sand placement included a Manitowoc Vicon 4100W crane mounted on a barge, material barge, tugboat, and clamshell bucket.

Installation

Approximately 6,176 tons (4,975 CY) of sand was installed from August 9 through August 31, 2005.

Sand was placed directly in-water using the Manitowoc Vicon 4100W crane mounted on a barge and a clamshell bucket. A material barge containing the load of sand was affixed to the side of the crane barge, and the crane barge was anchored in position with spuds. The crane operator took a load of sand from the material barge, and using the real-time display of the clamshell bucket location, lowered the bucket into position just over or just beneath the surface of the water, and released the sand. A square was recorded on the real-time display for each load of sand released. As sand was placed and grew to be out of reach for the crane boom, a deckhand moved the material barge forward or backward, as necessary for the crane operator to grab more bucket loads of sand. As sand was placed over a particular area and the next area requiring placement grew out of reach for the crane boom, one deckhand lifted the crane barge's spuds, while the other steered the crane barge into a new position using a tugboat. The crane operator remained in the crane cab and via radio, directed the deckhand operating the tugboat, using the real-time display of the grid and the position of the clamshell bucket. The second deckhand dropped the spuds as directed by the crane operator and deckhand operating the tugboat.

AAC's QC engineer performed all material quantity calculations, assisted the crane operator with placement methods and handled GPS data and technical issues. Each day, the QC engineer chose particular grid cells to receive sand based on the quantity of sand remaining on the material barge, and directed the crane operator to place the number of bucket loads required to achieve adequate

thickness. The crane operator took GPS coordinates for each bucket load of sand placed and swept each load as evenly as possible to achieve the design thickness. GPS coordinates were also taken at each spud location within the sediment cap boundary so that AAC could repair each spud hole at construction completion. All GPS coordinates were recorded and provided at construction completion.

Quality Control

E & E's oversight engineer worked closely with AAC's QC engineer throughout the duration of the project. AAC's QC engineer provided E & E's oversight engineer with a copy of their grid system and sand placement calculations. E & E's oversight engineer verified AAC's calculations and documented daily sand placement progress using a hard copy of AAC's grid and a material placement tracking spreadsheet including material quantities calculated for each grid cell, approximate material quantities actually placed, the dates placement occurred, the barge load used, etc. E & E's oversight engineer verified barge load quantities reported with barge load receipts received, and reviewed GPS coordinates taken throughout the day, to verify the daily sand placement plan.

Quality assurance (QA) for sand cap thickness verification in the sediment cap completion area was developed by E & E and implemented with AAC. Refer to section 2.6 for specifics on thickness verification procedures.

2.3.2.2 Armoring

The sediment cap design incorporated different types of armoring for the sand cap. The specific armoring material and installation location was dependent on the expected hydraulic and physical environments (e.g., currents, wave energy, erosive energies, etc.). Armoring included 6-inch minus rock and riprap. Prior to construction activities, PacRim Geotechnical, Inc. (PacRim), performed visual inspections of various rock armoring products, and a technical memorandum reported the inspection findings (PacRim 2005; Appendix F).

The portion of the sediment cap completion area below – 10 CRD received an 8-inch thick layer of 6-inch minus rock. The portion of the sediment cap completion area above – 10 CRD received an approximate 24-inch layer of riprap, which was underlain by an 8-inch thick layer of 6-inch minus rock, which was underlain by a 4-inch thick layer of gravel filter rock (2-inch minus rock). The layer of 6-inch minus rock above – 10 CRD was not called for in the design, but was added during construction. The gravel filter rock was installed to hinder the migration of the sand through the armoring layer. The following subsections describe in detail the materials and equipment used for installation, the installation methods, and QC utilized during construction.

Gravel Filter Rock

Materials, Equipment, Installation and Quality Control

The source of the gravel filter (2-inch minus rock) was Morse Bros., Inc.'s Angell Quarry in Portland, Oregon. AAC delivered the rock to the site via barge.

Approximately 111 tons (82 CY) of gravel filter rock was installed on August 27, 2005. The gravel filter rock was placed in a similar manner to the sand placement. Quality control was also performed consistent with the quality control for sand placement.

6-Inch Minus Rock

Materials, Equipment, Installation and Quality Control

The source of the 6-inch minus rock was the same as during sediment cap construction in 2004 - basalt and/or andesite, quarried from Morse Bros., Inc.'s Watters Quarry in St. Helens, Oregon. AAC delivered the rock to the site via barge. Approximately 2,472 tons (1,831 CY) of 6-inch minus rock was installed from August 27 through September 13, 2005. Installation includes 6-inch minus rock placed in areas upstream and downstream of the sediment cap completion area where armoring was discovered to be very light during AAC's dive survey. The 6-inch rock was placed in a similar manner to the sand placement. Quality control was also performed consistent with the quality control for sand placement.

Riprap

Materials, Equipment, Installation and Quality Control

The riprap material used to armor the sediment cap completion area above – 10 CRD, and the areas adjacent to the sediment cap completion area on either side above – 5 CRD, was composed of durable angular boulders less than 3 feet in diameter. The source was Westside Rock's Goble Quarry in Rainier, OR. AAC delivered the riprap to the site via barge.

The equipment used during riprap placement included a Manitowoc Vicon 4100W crane mounted on a barge, material barge, tugboat, John Deere 544H loader, Case 9020B excavator and a skip box. Approximately 1,211 tons (807 CY) of riprap was installed from August 29 through September 8, 2005. Riprap was placed directly in-water using the Manitowoc Vicon 4100W crane mounted on a barge and a skip box. A material barge containing the load of riprap was affixed to the side of the crane barge, and the crane barge was anchored in position with spuds. At the start of construction a deckhand operated a loader on board the material barge to load the skip box with riprap. A few days later, AAC subcontracted a heavy equipment operator from County Line Excavation to load the skip box with an excavator because AAC's loader had broken down during construction. After the skip box was loaded with riprap, with the real-time display of the skip box location, the crane operator carefully lowered the box into position just over the water, and released the riprap by tilting the box and moving it quickly across the area to be covered, in order to prevent mounding. A square was recorded on the real-time display for each load of riprap released; however, each riprap placement square mainly represents the start of a wide pass, rather than the approximate placement location or short pass represented during sand or 6-inch minus rock placement. AAC also represented the pass in the real-time display using a feature that saved a trail for a short period of time showing where the box had traveled. This helped AAC place the riprap in the desired area, but

the trails would erase after a few minutes so that the screen didn't become too cluttered.

Quality control was performed consistent with the quality control for sand placement.

2.3.3 Organoclay Mats

Visual inspections of near shore areas capped in 2004 were performed by DEQ and E & E between December 2004 and September 2005. These inspections observed NAPL sheens being released from three areas along the shoreline. These areas are: riverward of the TFA, west of the TFA and under the BNSF railroad bridge. The sheen releases appeared to be associated with the liberation of gas bubbles, presumably from the biological degradation of organic material.

DEQ elected to use organoclay mats to remedy these areas. The organoclay mats are manufactured by CETCO and contain 0.8 pounds of organoclay per square-foot. Technical information pertaining to the organoclay mats is provided in Appendix F.

Bubble-induced sheen releases were first observed west of the TFA within a month of sediment cap construction in 2004. In a test repair performed in August 2005 by Wilder Construction, DEQ and E & E, two organoclay mats covering a 150 square-foot area were centered over the sheen location. Three 5 foot by 10 foot chain link fence panels were placed overtop the mats to demarcate the location and hold the mats down. A total area of approximately 900 square feet was then capped with approximately 4.5 feet of sand, 4 inches of gravel filter rock, and 12 inches of 12-inch minus rock. (DEQ 2005; Appendix F). DEQ intends to remove these organoclay mats in July or August 2006 to determine their effectiveness in containing the sheen.

The sheen area riverward of the TFA was capped with organoclay mats by Wilder Construction under Cap Change Order No. 9 to the Upland Soil Cap Construction Contract with DEQ. Work on the organoclay cap was performed from October 18, 2005 to October 26, 2005 and is described in the *Upland Cap Construction Summary Report* (E & E 2006a). A short summary of this work is provided below.

The sheen area underneath the BNSF railroad bridge was capped with organoclay mats by AAC under Sediment Cap Completion Change Order No. 4. Work on the organoclay cap was performed from October 20, 2005 to October 25, 2005 and is described below.

2.3.3.1 Placement Riverward of the Tank Farm Area

Organoclay mats were placed approximately 300 feet along the shore in the embayment, riverward of the TFA, southwest of monitoring well clusters 44 and 45. The mats were placed perpendicular to the shore, and extend 60 feet down slope. A second layer of mats extended 40 feet from the shoreline. An

approximate 6-inch layer of sand was placed prior to organoclay mat placement to fill voids within the previously placed 6-inch minus rock armoring, an approximate 12-inch layer of sand was placed on top of the organoclay mats, an approximate 4-inch layer of 3.5-inch minus rock was placed over the sand, and an approximate 12-inch layer of 10-inch minus rock was placed over the 3.5-inch minus rock.

Refer to the *Upland Cap Construction Summary Report* (E & E 2006a) for a description of the material used for organoclay mat installation, the equipment, the installation methods, and quality control (QC) utilized during construction.

2.3.3.2 Placement Underneath the BNSF Railroad Bridge

Organoclay mats were placed approximately 115 feet along the shore underneath the BNSF railroad bridge, between ACB edges. The mats were placed perpendicular to the shore beginning at + 3 CRD, and extend 50 feet down slope. An approximate 6-inch layer of sand was placed prior to organoclay mat placement to fill voids within the previously placed 6-inch minus rock armoring, an approximate 12-inch layer of sand was placed on top of the organoclay mats, an approximate 12-inch layer of 6-inch minus rock was placed over the sand, and an approximate 24-inch layer of riprap was placed over the 6-inch minus rock above – 7 CRD. This subsection describes the material used for organoclay mat installation, the equipment, the installation methods, and quality control (QC) utilized during construction.

Materials and Equipment

The source of the sand, 6-inch minus rock and riprap was the same as that used during the original sediment cap completion construction. Organoclay mats were provided by CETCO. A technical memorandum including a technical data sheet describes the properties of the organoclay mats (CETCO 2005; Appendix F). AAC delivered the capping materials to the site via barge.

Equipment used during organoclay mat placement included a Manitowoc Vicon 4100W crane mounted on a barge, material barge, tugboat, Case 9020B excavator, clamshell bucket, skip box, and CETCO organoclay mat spreader bar.

Installation

Approximately 400 tons of sand was installed in an approximate 6-inch layer below the organoclay mats to fill voids within the previously placed 6-inch minus rock armoring, and an approximate 12-inch layer of sand was placed on top of the organoclay mats, using an excavator or crane and clamshell bucket. Knowing the total quantity of material, the quantity of material that the excavator bucket and clamshell bucket holds, the area to be covered, the design thickness, and therefore the number of bucket loads to spread as evenly as possible across the area, sand was placed from the material barge over the area using the barge edge, excavator position and swing radius, and 20-foot marks painted on the shoreline for reference. AAC subcontracted a heavy equipment operator from County Line

Excavation to place the sand with an excavator. AAC placed sand at the downstream end of the area, where the railroad bridge could be avoided, using the crane barge and clamshell bucket. Upon completion of sand placement, AAC had a diver walk the area to ensure appropriate sand coverage (sand filling voids in rock base).

AAC installed seven CETCO 100’ x 15’ organoclay mats. The organoclay mats were cut into smaller segments, placed perpendicular to the shore, and placed in layers under the direction of DEQ. The process consisted of AAC holding the 15'x100' mats up in the air using the crane and spreader bar, cutting them into 15'x50' pieces, and lowering the pieces into the skiff. AAC then took the pieces to shore using the skiff, where the ends of the mat pieces were weighted down with sand bags and rocks. Two divers guided the mats into place while two workers standing on the material barge pulled the boat in away from shore with ropes, allowing the mat to roll out of the boat and into the water. The bottom row of mats contained nine 15'x50' mat pieces, overlapping two feet, perpendicular to the shore. The top row contained ten 15'x25' mat pieces, with overlap seams staggering with the overlap seams of the bottom row. Under DEQ's direction, leftover mat was placed in a third layer over the upstream end of the area, where sheen bursts were witnessed most often. Upon completion, AAC inspected in-water mat placement and overlap seams and verified appropriate placement. To aid in the collection of as-built location information, the extent of the organoclay mats onto the shoreline (up to approximately +3 CRD) was marked with pink spray paint on the riprap on both sides of the organoclay mat placement area. Two orange buoys were also placed along the in-water edge of the mats and the horizontal distance was measured from each buoy to the mat edge on the shoreline.

Approximately 350 tons of 6-inch minus rock was installed in an approximate 12-inch layer above the 12-inch layer of sand, using an excavator or crane and clamshell bucket. As with sand placement, the 6-inch rock was placed from the material barge over the area using the barge edge, excavator position and swing radius, and 20-foot marks painted on the shoreline for reference. AAC subcontracted a heavy equipment operator from County Line Excavation to place the 6-inch minus rock with an excavator. AAC placed 6-inch minus rock at the downstream end of the area, where the railroad bridge could be avoided, using the crane barge and clamshell bucket. Upon completion of 6-inch minus rock placement, AAC had a diver walk the area to ensure appropriate 6-inch minus rock coverage.

Approximately 500 tons of riprap was installed in an approximate 24-inch layer above the 12-inch layer of 6-inch minus rock, using an excavator or a crane and skip box. AAC placed riprap at the downstream end of the area, where the railroad bridge could be avoided, using the crane barge and skip box. As with sand placement, the riprap was placed from the material barge over the area using the barge edge, and excavator position and swing radius. AAC subcontracted a

heavy equipment operator from County Line Excavation to place the riprap with an excavator. AAC first placed a strip of riprap on the upper portion of the slope (shoreward side) from approximately +7 CRD to +2 CRD. AAC then began placing a second strip of riprap from +2 CRD to -7 CRD. AAC gauged the thickness of the armoring as it was placed with a pole marked at 1-foot increments.

Quality Control

E & E's oversight engineer worked closely with AAC's crane operator and superintendent throughout the duration of the change order work. E & E's oversight engineer reviewed changes made to the organoclay mat placement plan with AAC, performed calculations, documented AAC's material placement techniques, and documented daily material placement progress in his/her field logbook.

2.3.4 Disposal and Demobilization

Following construction completion of the sediment cap, AAC demobilized construction equipment and cleared the site. AAC also placed at least one clamshell bucket load of 6-inch minus rock over each spud hole made during sediment cap completion construction.

2.4 Chronology of Major Events

Major events that occurred during sediment cap completion are listed below.

- **08/02/05** – Contract is awarded to AAC.
- **08/03/05 –** Notice to Proceed is issued to AAC.
- **08/08/05 –** Pre-construction meeting at the site.
- **08/09/05 –** AAC mobilizes to the site and begins sand placement.
- **08/12/05** – E & E takes GPS coordinates of the buoys placed at high points along the sediment cap boundary by West Coast Marine Cleaning on August 5, 2005.
- **08/19/05** – AAC begins Change Order No. 1 work and begins taking sand cores at the approximate center of each grid cell. AAC is using an approximate 50' x 50' cell grid system to place sand to the correct thickness across the work area.
- **08/22/05** – AAC begins the investigation of various obscure areas that were observed in DEA's side-scan sonar survey. AAC also begins investigating whether erosion has taken place in areas of particular concern. AAC discovers an area along the ACB edge in Willamette Cove that requires armoring.

- **08/23/05 –** AAC discovers an area upstream of the original work area that requires armoring. AAC begins mapping the ACB edge in Willamette Cove by placing buoys approximately every 100 feet.

- **08/24/05** – AAC discovers a large gap between ACB mats in Willamette Cove.

- **08/25/05** – AAC discovers a large area adjacent to the original work area on the upstream side that appears to be without armoring. AAC maps the 10-inch minus rock edge in the embayment by placing buoys approximately every 100 feet.

- **08/27/05** – AAC places gravel filter and begins 6-inch minus rock placement in the original work area.

- **08/29/05** – AAC begins riprap placement in the original work area.

- **08/30/05**– AAC completes riprap placement in the original work area.

- **08/31/05** – AAC completes sand placement.

- **09/01/05** – AAC completes 6-inch minus rock placement in the area adjacent to the original work area on the upstream side.

- **09/07/05** – AAC places riprap in the area adjacent to the original work area on the upstream side, and begins riprap placement in the area adjacent to the original work area on the downstream side where it was determined that heavier armoring was needed along the ACB edge between 0 and – 5 CRD. AAC spread the boulder pile out along the downstream end of the rock mound.

- **09/08/05** – AAC completes riprap placement in the area adjacent to the original work area on the downstream side.

- **09/09/05** – AAC completes 6-inch minus rock placement in the original work area. AAC begins trimming geotextile fabric found sticking up from underneath the ACB mats in Willamette Cove. AAC begins placing individual ACB blocks, leftover from sediment cap construction in 2004, in gaps found in the Willamette Cove.

- **09/12/05** – AAC completes individual ACB block placement in gaps found in the Willamette Cove, including the large gap found between ACB mats during the dive survey. AAC removes old PVC pipe and buoy markers that were used during 2004 sediment cap construction at low water. AAC cut loops that were sticking up in a dangerous manner using

wire cutters and torches. Due to very low water, sheen was observed across the site, most notably underneath the BNSF railroad bridge.

- **09/13/05** – AAC places 6-inch minus rock in the area along the ACB edge in Willamette Cove and the area upstream of the original work area – areas that required armoring as determined during the dive survey. AAC places 6-inch minus rock over their spud locations.

- **09/14/05** – AAC demobilizes from the site.

- **10/20/05** – AAC mobilizes to the site and begins Change Order No. 4 work. AAC places sand over the area to receive organoclay mats. AAC begins organoclay mat placement.

- **10/21/05** – AAC completes organoclay mat placement. AAC places sand over the organoclay mats and begins placing 6-inch minus rock over the sand.

- **10/24/05** – AAC completes 6-inch minus rock placement and begins riprap placement.

- **10/25/05** – AAC completes riprap placement and places ¾-inch minus rock and riprap over their spud locations. AAC demobilizes from the site.

2.5 Issues, Corrective Actions, and Project Deviations

Project activities were modified in response to site conditions, requests for additional work, and adjustments to the site work directed by DEQ and E & E. The following subsections describe the issues that arose, the resulting corrective action that was taken, and the project deviations.

2.5.1 Issues

The only issue of non-conformance that arose was the Contractor neglecting to fill the last spud holes created while demobilizing for the first time.

2.5.2 Corrective Actions

2.5.2.1 Spud Holes

The spud holes were filled by the Contractor during the next mobilization.

2.5.3 Project Deviations

Generally the process of implementing E & E and DEQ requested changes or deviations considered necessary to the sediment cap design and construction was as follows:

- E & E and DEQ modified the construction contract to provide exploratory work, to react to the findings of the exploratory work, to contain blebs of

NAPL, or to strengthen previous construction. Since all changes were beyond the scope of the original contract and required an increase in cost, change orders were issued.

2.5.3.1 Change Orders

By the end of the project, five Contract Change Orders had been issued. Multiple changes were addressed in each. The change orders are included in Appendix G and summarized in Table 2-1. The table presents a brief description of the deviation and scope of the change followed by a discussion of the reason, corrective action, and result.

2.5.3.2 Field Memorandums/Directives

A process of numbered field memos/directives was implemented to provide direction to AAC. Six field memos/directives were issued to AAC and are included in Appendix G. Not all field memos/directives had monetary or schedule impacts.

2.6 Construction Oversight

At least one E & E oversight engineer was on site each day construction was performed to document the importation of material, oversee construction tasks, and perform inspections on work completed. QC performed in relation to particular construction activities can be found in section 2.3. An organizational chart showing the assignments of E & E personnel is included in Appendix H. The spreadsheets used to track imported material and material placement are provided in Appendix I.

Quality assurance (QA) for sand cap thickness verification in the sediment cap completion area was developed by E & E and implemented with AAC. The grid system AAC used to place sediment cap materials contained 30 grid cells; thus, it was decided to take a core at the approximate center of each grid cell to verify adequate sand thickness. AAC used a three-person dive crew and boat, and a DEA hydrographer guided the dive crew to the core locations using GPS and Hypack®. AAC divers used 2-inch diameter, 5-foot long clear polyvinyl chloride (PVC) tubes and a PVC slider that E&E made to collect the cores. Cores were taken within five feet of the center of each grid cell and DEA recorded the coordinates. AAC obtained 26 cores between August 19 and August 25, 2005. Three grid cells had not received sand before the coring process was complete, and one grid cell had little sand over rock, causing the coring tube to hit refusal at a depth of approximately 2 inches. As can be expected, some grid cell cores were deficient and others exceeded the sand thickness required. Overall, the cores showed competent sand placement by AAC. Refer to Figure 2-1 for sand coring data and locations.

2.7 Environmental Monitoring

Prior to construction, E & E prepared an EMRP, which outlined the monitoring, documentation, and reporting procedures to be followed by oversight personnel.

These procedures ensure that the measures presented in the NOAA Fisheries biological opinion were implemented.

E & E utilized a full-time, on-site environmental monitor. When construction activities were performed, monitoring included daily shoreline walks, daily turbidity monitoring (during in-water work), and daily pollution/erosion control monitoring. The contractor's procedures were monitored during all construction activities.

The environmental monitor and/or the oversight supervisor performed a daily shoreline walk. During the daily shoreline walk, the environmental monitor/oversight supervisor would document the occurrence of all sick, dead or injured fish and animals, any sheen observed in the river, and any changes to shoreline features in the daily environmental monitoring report forms.

Although no dead or injured endangered species were found, in the event that a dead or injured endangered species had been found, the environmental monitor would have:

- Documented the details in his/her logbook and on the daily environmental monitoring report forms, and taken photos of the specimen.
- Contacted the E & E fisheries biologist to confirm species identification.
- Made initial notification to the NOAA Fisheries Law Enforcement Office, Vancouver Field Office, Vancouver, Washington.
- Reported the discovery to the DEQ Project Manager and NOAA Fisheries via email and phone as necessary.

The occurrence of sheen was most frequently attributed to seepage from the sediment cap area under pressure, either through sediment cap material placement; in-water heavy equipment operation, such as spud movement; or low water. Other than the previously acknowledged sheen releases that appeared underneath the BNSF railroad bridge, only two very slight sheens that lasted for less than five minutes were observed during completion of the sediment cap. If notable sheen had been observed on the river, the environmental monitor would have notified the oversight supervisor immediately, who in consultation with the DEQ Project Manager would have decided what action to take. In case of large sheens, E & E had West Coast Marine Cleaning, Inc. on call for additional aid in containment/cleanup. They deploy either oil-absorbent boom or a skirted containment boom, and in some incidences, a combination of both. The boom is left in place until the sheen dissipates. Smaller sheens would have been contained/absorbed from shore or from AAC's water quality monitoring boat.

To ensure that the State of Oregon's Water Quality Standards were met during construction and to implement the reasonable and prudent measures as prescribed in the biological opinion, E & E developed the water quality monitoring plan (WQMP), which was included in the EMRP. The on-site environmental monitor

used this plan to assist with monitoring of the contractor's turbidity-minimizing procedures and construction techniques. Turbidity measurements were taken to monitor the construction activities. If turbidity readings had exceeded the turbidity criteria or improper construction techniques had been observed, proper notification and actions would have been taken. The WQMP was available on the McCormick & Baxter site for inspection upon request by EPA or NOAA Fisheries.

Turbidity was monitored during all in-water construction activity. A turbidity background monitoring point was established at a representative (undisturbed) location a minimum of 100 feet upstream from the sediment cap boundary. The background measurement location varied because of tidal influences. Turbidity sampling for compliance was monitored at points 100 feet downstream from the sediment cap boundary. Water samples/readings were collected/taken at the bottom, mid-level, and top of the water column but not closer than within 5-foot intervals. Six readings were taken from each depth and averaged for a more accurate measurement.

Turbidity measurements were taken and recorded at least once every four hours during in-water work. On any day in-water work occurred, the first sample was taken at four hours after the initiation of activity and once at each four-hour interval thereafter. If the turbidity level had exceeded turbidity criteria, initial notifications would have been made to the oversight supervisor and directly to AAC's superintendent. Following notifications, more readings would have been taken at the upstream and downstream sampling locations. If the upstream/downstream readings did not account for the excessive turbidity, another reading at the same location of the initial readings would have been taken within 30 minutes of the first. If these readings were also above the criteria, the environmental monitor would have notified the oversight supervisor. The turbidity-causing work would then have been shut down or modified, and the turbidity would have been measured at 30-minute intervals until it came down to acceptable levels.

Visual monitoring of turbidity levels occurred at least once every four hours (two-hour lag time from turbidity readings) during in-water work. Visual observations were recorded on the daily turbidity report. If the environmental monitor had observed turbidity at levels that were estimated to be approaching the turbidity action level, a turbidity measurement would have been taken. If the initial readings had indicated that the turbidity level was above the turbidity action level criteria the environmental monitor would have followed the procedures described above.

As prescribed in the biological opinion, the turbidity meter was calibrated twice daily as long as in-water work continued. One calibration was made prior to daily monitoring, and one upon completion of daily monitoring. The results of calibration were recorded in the Daily Turbidity Report.

Daily turbidity measurements, including information identifying all sampling locations and times, and calibration information, were emailed to NOAA Fisheries, and the DEQ Project Manager.

Results of all monitoring activities are presented in the *Sediment Cap Completion – Sewer Line Repair Environmental Monitoring Report* (E & E 2006d), submitted to NOAA Fisheries on January 3, 2006. The report includes photo documentation, copies of the daily environmental monitoring forms and daily turbidity reports. A copy of the environmental monitoring report is included in Appendix J.

2.8 Health and Safety

AAC, E & E, and DEQ were responsible for ensuring proper health and safety procedures were followed at the site during construction activities. All contractors and consultants performing work on the site developed and implemented their own site safety plans in accordance with the provisions of the Occupational Safety and Health Administration (OSHA) Standards (29 Code of Federal Regulations [CFR] 1910) and General Construction Standards (29 CFR 1926), including OSHA Hazardous Waste Operations and Emergency Response, Interim Final Rule (29 CFR 1910.120). Compliance with all other applicable federal, state, and local laws and regulations was also required.

A formal safety meeting was held at the beginning of the project to review safety procedures with all site personnel and inform workers of potential hazards. AAC conducted site-safety briefings for all new personnel reporting to the site and for all visitors to the site.

Protective clothing, such as a hard hat, steel-toed boots, safety vests, safety glasses and a life jacket, was required for anyone on board the crane barge. The primary physical hazards on the barge included heavy equipment operation, noise, slips, trips, and falls. There was minimal potential for contact with contaminants during in-water sediment cap material placement activities in highly contaminated areas (e.g., NAPL seeps and hot-spot area). However, other than a few instances of increased vapor scent during spud movement, no contaminant releases were noted.

Overall, work was conducted safely at the site during the RA. No injuries were reported during the RA implementation.

2.9 Documentation

2.9.1 Logbooks

E & E's field personnel were required to keep a daily logbook. A typical logbook entry consisted of the date, weather, details of construction, work completed, and various notes about the day's activities. At the end of each daily entry, the

individual signed and dated his/her logbook to signify that he/she was done with the entry for the day.

2.9.2 Weekly Meetings

Each week a meeting was held that included AAC, DEQ, and E & E. The purpose of the meeting was to discuss the progress of the project, to look ahead to future activities, and to resolve concerns brought to the table by any of the parties. Prior to the meeting, DEQ and E & E met to develop a list of points to be addressed. The minutes of the weekly meetings are included in Appendix K.

2.9.3 Photo Documentation

E & E field personnel had access to on-site digital cameras and were encouraged to use them often. Any time a digital photo was taken, the individual who took the photo recorded the date, time, photo number, direction, and short description of the photo in his/her photo log. Selected photos are included in Appendix L.

2.9.4 Daily Field Report

At the conclusion of each workday, E & E field staff was required to fill out a daily field report. The daily field report summarized; the day's weather, (sub) contractors on site, major equipment used, work completed, notes/issues, any safety concerns or nonconformances and who was notified. Each member of the E & E field staff completed his/her own individual report, from which one field staff member would compile a master daily report.

2.9.5 Daily Turbidity Report

During all periods of in-water work, the E & E environmental monitor monitored the Willamette River for turbidity levels. The results of the monitoring were recorded by the environmental monitor in the daily turbidity report at the conclusion of each day of in-water work. The daily turbidity report contained the date, time of testing, location of testing, results of testing, results of calibration, and name of monitor. Copies of the report were sent to the DEQ Project Manager and NOAA Fisheries via email on a daily basis as in-water work persisted.

2.9.6 Daily Environmental Monitoring Form

E & E's environmental monitor completed a daily environmental monitoring form concluding each workday. The form contains information including; monitor's name, date, time, river stage observations, water quality observations (i.e., turbidity and sheen), movement of shoreline features, photo documentation, and perimeter walk details.

2.9.7 Aerial Photographs

Several aerial photographs were taken of the site between November 2004 and September 2005. These aerial photographs are included in the Archeological Investigations Northwest, Inc. (AINW) 2005 Monitoring Report included as an appendix to the *Upland Cap Construction Summary Report* (E & E 2006a).

2.10 Community Relations

The McCormick & Baxter site is situated in close proximity to a residential neighborhood and receives substantial public and media attention because of its listing on the National Priorities List. In order to maintain a proactive approach to community relations prior to and during completion of the sediment cap, DEQ representatives attended public meetings and distributed fact sheets to the local community (e.g., neighborhood associations). DEQ and the community were able to exchange information/concerns and answer questions. This approach enabled construction to proceed with support of the local community and avoid conflicts that could potentially slow or stop construction.

Prior to sediment cap completion construction, the DEQ Project Manager attended meetings with and gave presentations to:

- St. John's Neighborhood Association – May 9, 2005
- Portland Harbor Community Advisory Group – May 11, 2005
- Overlook Neighborhood Association – May 17, 2005
- University Park Neighborhood Association – May 23, 2005

During and after construction, the DEQ Project Manager gave tours of the site to:

- Portland Harbor Community Advisory Group – July 29, 2005
- University Park Neighborhood Association – August 15, 2005
- North Portland residents – October 19, 2005
- Portland Harbor Community Advisory Group and North Portland residents – November 13, 2005

2.11 Post-Construction Monitoring

A monitoring and maintenance plan was drafted in June 2003 (E & E 2003b). It was developed under certain assumptions that are expected to be modified as remedial actions at the site near completion and a site-wide Operation and Maintenance (O&M) Plan is developed by DEQ.

The premise of the monitoring and maintenance plan was to perform annual monitoring for the first three years to confirm that the sediment cap was stable and performing as designed. The frequency of monitoring was to taper off to every five years unless a significant natural event occurred. The natural events included a 100-year flood event or greater, a 4.5-magnitude or greater earthquake, or storm events that caused significant debris to be carried by the Willamette.

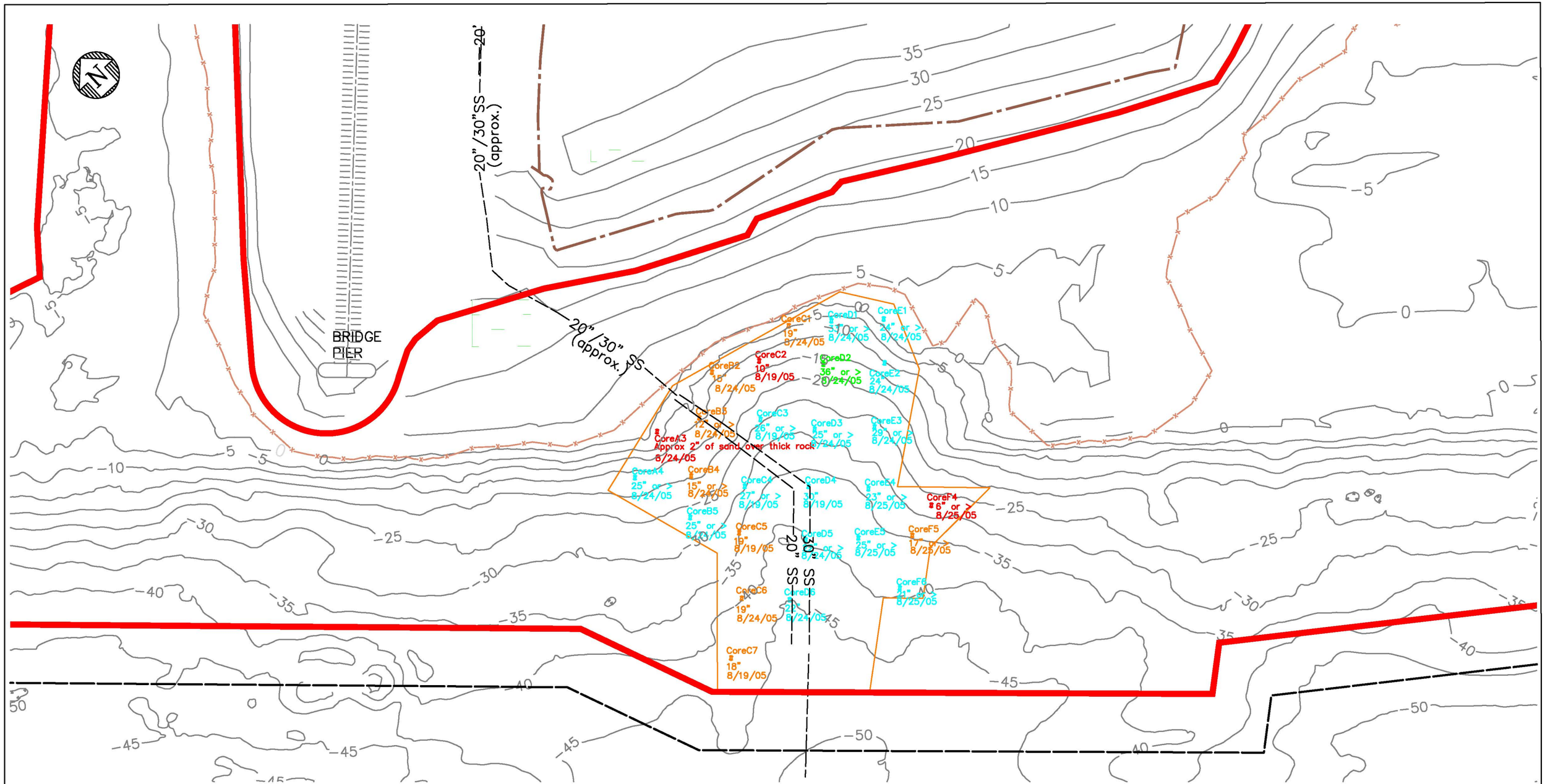
Two tiers of monitoring were proposed. Outcomes to Tier 1 monitoring could lead to the more intensive investigations under Tier 2. For example, if a visual inspection shows a breach in the armoring (Tier 1), an evaluation as to the cause(s) and repair of the armoring is predicated (Tier 2). If the event is expected to occur frequently, Tier 2 also recommends that a plan to mitigate against the event should be formulated. The Tier 1 actions include inspection of the

armoring, sand overlay, and the regraded bank; determining if sediment is being deposited on or within the armoring or whether a benthic community is establishing itself on the cap; sampling the capped seep areas for contamination; and performing bathymetric surveys to compare to historical surveys to determine if changes have occurred. Besides armoring repair as cited above, Tier 2 activities include additional sampling to determine future, if any, courses of action.

Table 2-1
Sediment Cap Completion
Summary of Change Orders
McCormick & Baxter Site
Portland, Oregon

Reason	Resulting Change(s)
Change Order 1 dated 18 August, 2005: Inspect portion of sediment cap constructed in 2004. Perform exploratory work to map cap and determine cap template. The exploratory work was needed to fill data gaps and to determine if changes to the cap had occurred. Additionally, cutting of loops on submerged ACB was specified to eliminate a potential hazard to the public.	The Contractor performed exploratory work as follows: a. Obtained cores in sand in cap completion area b. Mapped cap edge. c. Determined the condition of the ACB and 6-inch minus interface. d. Investigated the no-armor area. e. Checked selected submerged logs and their impact upon the sediment cap. f. Investigated the shoal downstream from the railroad bridge. g. Checked the "armor slough". h. Checked erosion near the railroad. i. Located and cut plastic and stainless steel loops on the ACB. Contract quantities and costs were adjusted for the changes. The number of days to complete the job remained unchanged.
Change Order 2 dated 30 August, 2005: Provide additional rock materials to repair deficiencies in the sediment cap and to provide a better foundation for riprap to be placed as part of the sediment cap completion base contract work.	Additional 6" Minus Rock a. The Contractor furnished an additional 400 tons of 6-inch minus rock. b. The Contractor installed 200 tons beneath the contracted riprap. c. The Contractor installed 100 tons in three discrete repair areas discovered by recent dive team inspections, as specified by the project engineer. d. The Contractor installed 100 tons over barge spud locations that penetrated the sediment cap. Contract quantities and costs were adjusted for the changes. The number of days to complete the job remained unchanged.
Change Order 3 dated 1 September, 2005: Place additional rock materials at locations selected by DEQ. These locations were judged to be most prone to future erosion.	The Contractor provided and placed the following: 1. Additional 6-Inch Minus Rock a. The Contractor furnished an additional 200 tons of 6-inch minus rock. b. The Contractor installed it at locations selected by DEQ. 2. Additional Riprap a. The Contractor furnished an additional 600 tons of riprap b. The Contractor installed it at locations selected by DEQ. Contract quantities and costs were adjusted for the changes. The number of days to complete the job remained unchanged.

Table 2-1 Sediment Cap Completion Summary of Change Orders McCormick & Baxter Site Portland, Oregon	
Reason	**Resulting Change(s)**
Change Order 4 dated 12 October, 2005: Placement of organoclay mats over NAPL sheen area beneath BNSF railroad bridge. Placement of sand and armor over mats. Additionally, dive services were specified so sampling of subsurface locations could occur.	1. The Contractor provided the following additional quantities of materials aboard a barge at the site and mobilized/demobilized equipment and personnel to and from the site to place the material. a. Riprap-500 tons. b. 6-inch minus-350 tons. c. Sand-400 tons. d. 7 CETCO Reactive core mats 100'x15'. e. CETCO Spreader Bar. 2. The Contractor provided a dive crew and barge, as well as survey team for locations, to sample pore water in sediment cap. Contract quantities and costs were adjusted for the changes. The number of days to complete the job remained unchanged
Change Order 5 dated 10 November, 2005: Change the scope of the specified bathymetric survey to include all portions of the cap that can be surveyed with multi-beam sonar. For a reasonable increase in price, a survey of the entire cap would identify changes over the last year and provide a criterion for future performance audits.	The scope of the bathymetric survey was expanded. Contract costs were adjusted for the changes. The number of days to complete the job remained unchanged.



LEGEND

- DSL EASEMENT (#31530-EA)
- SAND CAP BOUNDARY
- SAND AND ARMOR (AUGUST 2005)
- SURVEY DATUM BOUNDARY (CRD/NGVD)
- HIGH PRESSURE SEWER LINE

CORING SAND THICKNESSES

RED: 0–12"
ORANGE: 13"–21"
CYAN: 22"–36"
GREEN: >36"

SCALE IN FEET: 0 80 160 240

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
APPROVED BY

FIGURE 2-1

SAND CORING DATA AND LOCATIONS

McCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

SCALE: NOTED
DATE ISSUED: 5-24-06
C.A.D. FILE NO.: Sediment Cap CSR Figs.dwg

D:\ENGINEERING DOCUMENTS\001688.0Y14.29.04 M&B SED CAP CONSTRUCTION\POST CONSTRUCTION\SEDIMENT CAP CSR FIGS.DWG

3 Project Quantities and Costs

A summary of the project quantities (materials delivered and installed) is provided in Table 3-1.

A detailed summary of the RA construction quantities and costs is presented in Table 3-2. This table includes costs associated with sediment cap completion construction activities performed by AAC, costs for DEQ management, and costs for engineering/consulting services performed by E & E and its subcontractors.

For the AAC construction portion, Table 3-2 segregates contractual (i.e., bid) items from change order items. The total bid cost for all contractual items was $430,000. During the course of construction, five change orders were approved by DEQ (subsection 2.5). The total cost for all change order work was approximately $207,606. Additionally, $16,362 was credited to DEQ for budget not expended during performance of T&M work. In summary, the combined total estimated AAC construction cost was $621,244.

DEQ management and legal support totaled $47,169. RA engineering and consulting services performed by E & E and its subcontractors totaled $134,808.

The total amount for implementation of the sediment cap completion RA is approximately $803,222.

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Table 3-1

SUMMARY OF CONSTRUCTION QUANTITIES
SEDIMENT CAP COMPLETION
MCCORMICK & BAXTER CREOSOTING COMPANY SITE
PORTLAND, OREGON

Sediment Cap Completion Area	
Sand	6,716 tons
Gravel Filter	111 tons
6-Inch Minus Rock	2,472 tons
Riprap	1,212 tons
Organoclay Mat Placement Underneath BNSF Railroad Bridge	
Organoclay Mats	7 rolls
Sand	400 tons
6-Inch Minus Rock	350 tons
Riprap	500 tons
Organoclay Mat Placement West of the Tank Farm Area Seep	
Organoclay Mats	23 rolls
Sand	2,050 tons
4-Inch Minus Rock	374 tons
Riprap	1,019 tons

Table 3-2

SUMMARY OF CONSTRUCTION QUANTITIES AND COSTS
SEDIMENT CAP COMPLETION (August 2005 through October 2005)
MCCORMICK & BAXTER CREOSOTING COMPANY SITE
PORTLAND, OREGON

Item	Description	Units	Unit Price	Estimated (Bid) Quantity	Actual Quantity	Bid Amount	Actual Amount (Final Cost)
Construction Contract							
1	Site Mobilization/Demobilization	Lump Sum	$20,840.00	1	1	$20,840.00	$20,840.00
2	Submittals	Lump Sum	$7,000.00	1	1	$7,000.00	$7,000.00
3	Survey	Lump Sum	$17,000.00	1	1	$17,000.00	$17,000.00
4	Sand Cap	Tons	$35.00	6,700	6,700	$234,500.00	$234,500.00
5	Gravel Filter	Tons	$70.00	100	100	$7,000.00	$7,000.00
6	Riprap	Tons	$60.00	611	611	$36,660.00	$36,660.00
7	6-Inch Minus Rock	Tons	$50.00	1,900	1,900	$95,000.00	$95,000.00
8	Quality Control During Construction	Lump Sum	$12,000.00	1	1	$12,000.00	$12,000.00
CONSTRUCTION CONTRACT SUBTOTAL						**$430,000.00**	**$430,000.00**
Change Orders							
Change Order No. 1 - Dive Survey							
1.a	3-man Dive Crew w/Equipment	Hours	$451.50	64	64	$28,896.00	$28,896.00
1.b	4-man Crane Barge Crew	Hours	$989.23	12	12	$11,870.76	$11,870.76
1.c	DEA Field 4-hour day	Hours	$200.06	4	4	$800.24	$800.24
1.d	DEA Field 8-hour day	Hours	$139.41	24	24	$3,345.84	$3,345.84
1.e	DEA In-House	Hours	$69.30	20	20	$1,386.00	$1,386.00
Change Order No. 2 - Additional 400 Tons of 6-Inch Minus Rock		Lump Sum	$13,193.84	1	1	$13,193.84	$13,193.84
Change Order No. 3 - Additional 600 Tons of Riprap and 200 Tons of 6-Inch Minus Rock		Lump Sum	$40,148.36	1	1	$40,148.36	$40,148.36
Change Order No. 4 - Organoclay Mat Placement Underneath the BNSF Railroad Bridge							
4.1	Organoclay Mats	Lump Sum	$87,864.03	1	1	$87,864.03	$87,864.03
4.2.a	Sampling w/AAD	Hours	$451.50	24	20	$10,836.00	$9,030.00
4.2.b	Sampling (DEA)	Hours	$237.35	24	23.5	$5,696.40	$5,577.73
4.3.a	Field Survey (DEA)	Hours	$139.41	8	8	$1,115.28	$1,115.28
4.3.b	Office Survey (DEA)	Hours	$69.30	16	0	$1,108.80	$0.00
Change Order No. 5 - Expand Bathymetric Survey		Lump Sum	$4,378.00	1	1	$4,378.00	$4,378.00
CHANGE ORDER SUBTOTAL							**$207,606.08**
REDUCTION TO CONTRACT AMOUNT AT COMPLETION							**$16,362.00**
TOTAL CONTRACT AMOUNT							**$621,244.08**
Other Construction Costs							
DEQ management and DOJ Legal Support							$47,169.00
Engineering and Consulting Support (Ecology & Environment):							
22.02	Sediment Cap Completion RA Plans						$1,408.00
24.02	Sediment Cap Completion Contractor Management						$29,502.00
25.02	Sediment Cap Completion Residential Inspection						
	E&E						$34,478.00
	E&E Subcontractors	West Coast Marine Cleaning					$3,677.00
		PacRim Geotechnical, Inc.					$1,948.00
29.02	Sediment Cap Completion Construction Summary Report						$16,627.00
E & E SUBTOTAL							**$134,809.00**
OTHER CONSTRUCTION COSTS SUBTOTAL							**$181,978.00**
TOTAL SEDIMENT CAP COMPLETION CONSTRUCTION COST THROUGH JANUARY 1, 2006							**$803,222.08**

Note: Costs do not include placement of organoclay cap performed by Wilder Construction Company

4 References

Ecology and Environment, Inc. (E & E), May 2006a, *Upland Cap Construction Summary Report, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, May 2006b, *Sediment Cap Inspections and Repairs, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, May 2006c, *Sediment Cap Construction Record Drawings, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, May 2006d, *Sediment Cap Construction Summary Report, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, January 2006e, *Sediment Cap Completion – Sewer Line Repair Environmental Monitoring Report, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, August 2005a, *Environmental Monitoring and Reporting Plan Amendment, Sediment Cap Completion, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, August 2005b, *Construction Quality Assurance Plan Amendment, Sediment Cap Completion, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, July 2005c, *Technical Plans and Specifications, Sediment Cap Completion, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, January 7, 2005d, *Sediment Cap Environmental Monitoring Report, McCormick & Baxter Creosoting Company, Portland, Oregon,* prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, September 10, 2004a, *Technical Memorandum: Soil Sampling Summary Report—Metro Property—Willamette Cove*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, June 22, 2004b. *Additional Consultation on the Endangered Species Act – Section 7 Consultation Biological Opinion (Addendum) for the McCormick & Baxter Creosoting Company Superfund Site, Willamette River Remediation Sediment Cap, Multnomah County, Oregon, Contractor's Proposed Activities for Pile Towing, Equipment Operation in Water, and Underwater Grouting during Sediment Cap Construction*.

_____, June 18, 2004c, *Technical Memorandum: Chemical Analyses of Import Topsoil and Sand*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, June 2004d, *Environmental Monitoring and Reporting Plan, Sediment Cap Construction, McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, June 2004e. *Construction Quality Assurance Plan, Sediment Cap Construction, McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, April 30, 2004f, *Additional Consultation on the Endangered Species Act – Section 7 Consultation Biological Opinion (Addendum) for the McCormick & Baxter Creosoting Company Superfund Site, Willamette River Remediation Sediment Cap, Multnomah County, Oregon*.

_____, April 2004g. *Remedial Action Construction Summary Report, Combined Sheet Pile and Soil-Bentonite Barrier Wall, McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, December 2003a, *Technical Plans and Specifications, Sediment Cap, McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, June 2003b, *Draft Final Monitoring and Maintenance Plan, McCormick & Baxter Creosoting Company, Portland, Oregon, Sediment Cap*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, April 2002, *Sediment Cap Basis of Design*, McCormick & Baxter Creosoting Company, Portland, Oregon, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

CETCO Colloid Environmental Technologies Company (CETCO), October 28, 2005, *Memorandum: Technical Data Sheet for Organoclay Reactive Core Mat*, prepared for E & E.

National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries), Northwest Region, March 15, 2004, Endangered Species Act – Section 7 Consultation Biological Opinion & Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, McCormick & Baxter Creosoting Company Site, Willamette River Remediation Sediment Cap, Multnomah County, Oregon.

Oregon Department of Environmental Quality (DEQ), 2005, *Technical Memorandum: Description of Recent Placement of Organoclay Mat at M&B Site over a Bubble Channel that Carried Creosote Coated on the Bubble to the Surface.*

Oregon Department of State Lands (DSL), 2004, *Oregon Department of State Lands Easement No. 31530-EA Recorded in Multnomah County, Oregon, 2004-083416, Date 5/12/2004, 01:08:24 pm*.

PacRim Geotechnical, Inc. (PacRim), August 25, 2005, *Memorandum: Quarry Visits – Sediment Cap Completion Project*, prepared for E & E.

_____, August 5, 2004, *Memorandum: McCormick & Baxter Rock Quality*, prepared for E & E.

Remtech, Inc. (Remtech), June 7, 2004, *Construction Operations Plan* (COP), Sediment Cap, McCormick and Baxter Creosoting Company, Portland, Oregon, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

United States Environmental Protection Agency (EPA), October 2003a, *Biological Assessment Addendum*, McCormick & Baxter Creosoting Company, Portland, Oregon, Sediment Cap [prepared by the USACE].

_____, October 22, 2003b, *Clean Water Act Section 401 Water Quality Certification*, McCormick & Baxter Creosoting Company, Portland, Oregon, Sediment Cap Remedial Action [prepared by the USACE].

_____, October 20, 2003c, *Substantive Compliance with Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*, McCormick & Baxter Creosoting Company, Portland, Oregon, Sediment Cap Remedial Action [prepared by the USACE].

_____, August 2002, *Explanation of Significant Difference*, McCormick & Baxter Creosoting Company Superfund Site, Portland, Oregon.

_____, June 2002, *Biological Assessment*, McCormick & Baxter Creosoting Company, Portland, Oregon.

_____, 1998, *ROD Amendment*, McCormick & Baxter Creosoting Company, Portland, Oregon.

_____, March 1996, *Record of Decision (ROD)*, McCormick & Baxter Creosoting Company, Portland Plant, Portland, Oregon.

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A DAS Exemption #503

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FINDINGS OF FACT SUPPORTING AN EXEMPTION FROM COMPETITIVE BIDDING REQUIREMENTS

EXEMPTION # 503

Before the Director, Department of Administrative Services
of the State of Oregon

Exemption Request of the Department of Administrative Services	)	Findings of Fact
For the Department of Environmental Quality	)	
McCormick and Baxter Sediment Cap Construction	)	

ORS 279C.335(1) requires, with certain exceptions, that all Public Improvement contracts be based on competitive bids and, under ORS 279C.375, awarded to the lowest responsive and responsible bidder. ORS 279C.335(2) permits the Director of the Department of Administrative Services ("DAS"), as the state's public contract review authority, to grant, under certain conditions, specific exemptions from the requirement for competitive bidding upon the approval of specified findings.

OAR chapter 125, division 249 allows the Department of Administrative Services to exempt a Public Improvement contract from the requirements to be competitively bid, provided written findings supporting the use of a non-competitive bid process show compliance with ORS 279C.330 and 279C.335(2)(a) and (b), and to address additional considerations in ORS 279C.335(c).

ORS 279C.330 defines "Findings" and refers to specific information that should be addressed. Under ORS 279C335(4) a public hearing must be held before these findings are finally adopted, allowing the opportunity for all interested parties to comment on the draft findings. The hearing for review of these findings was held at 2:00 PM on June 27, 2005, in the Front Conference Room at the DAS office at 1225 Ferry Street, Salem, Oregon, as published in the public notice in the Daily Journal of Commerce on Monday, June 13. There was no oral testimony or written comments on the draft findings.

I
BACKGROUND

Project Description: The construction of a multi-layer, underwater sediment cap of approximately 1.4 acres as an environmental remedial action (RA) measure at the former McCormick & Baxter Creosoting Company site in north Portland. The sediment cap will be placed over and adjacent to two high-pressure sewer mains, owned by the City of Portland, that run along the Willamette River bottom at the site.

The sediment cap will consist of approximately two feet in thickness of sand cap, which then will be overlain with various thicknesses of rock and rip-rap so that the cap will withstand hydraulic conditions in the Willamette River. This multi-layer sediment cap will be placed over submerged sediments. The work must be conducted on an expedited basis, commencing on about the first week of August 2005, with completion by September 15, 2005, to ensure the completion of all final inspections, environmental project reporting, and completion of close-out documentation before September 30, 2005.

History of the Site and Prior Projects: The McCormick & Baxter Creosoting Company site (site) is located on the northeast shore of the Willamette River in north Portland. The legal address is 6900 North Edgewater Ave., Portland, Oregon. The site includes 43 acres of land and 23 acres of contaminated sediments beneath the Willamette River.

McCormick & Baxter Creosoting Company operated between 1944 and 1991, treating wood products with creosote, pentachlorophenol, and inorganic (arsenic, copper, chromium, and zinc) preservative solutions. Historically, process wastewaters were discharged directly to the Willamette River, and other process wastes were dumped in several areas of the site. Significant concentrations of wood-treating chemicals have been found in soil and groundwater at the site and in river sediments adjacent to the site.

The United States Environmental Protection Agency (EPA) listed the site on the National Priorities List (NPL), also known as the list of "Superfund Sites," in June 1994, based on information collected by DEQ between September 1990 and September 1992. The EPA also designated the Oregon Department of Environmental Quality (DEQ) as the lead agency for implementing the selected remedies while most of the funding for remedial design and construction is being provided by EPA.

The primary risks associated with the site are from exposure to wood-treating compounds in soil, river sediments and surface water near the site. These compounds have entered the food chain, and the Oregon Department of Human Services maintains a health advisory for crayfish harvesting within 1,000 feet of the site.

The DEQ implemented a number of interim removal measures between 1992 and 1994, including plant demolition, sludge and soil removals, and extraction of creosote from the groundwater aquifers.

The Record of Decision (ROD) was issued by EPA and DEQ in April 1996 after considering public comments on the Proposed Cleanup Plan. The ROD specified cleanup remedies for contaminated groundwater, sediment and soil.

A component of the groundwater remedy consisted of an automated creosote extraction and groundwater treatment system. However, due to poor product recovery and high operating costs, the automated system was discontinued in late 2000. Creosote is currently being recovered by passive and manual methods. Approximately 3,000 gallons have been recovered since 1996. A contingency groundwater remedy was implemented in the summer of 2003, with the construction of a combination steel sheet pile and soil bentonite slurry wall surrounding 18 acres. The

purpose of the barrier wall is to prevent migration of creosote to the Willamette River. Implementation of the soil remedy began in March 1999 with the removal of 33,000 tons of highly contaminated soil and debris. The soil remedy will be completed when an impermeable/earthen cap is completed in September 2005.

The sediment remedy was implemented in 2004 and primarily consisted of a sand cap placed over 23 acres of contaminated sediment. An oil adsorptive material known as organophyllic clay was used in the creosote seep areas. To protect the cap from erosion, the sand and organophyllic clay were armored with a combination of rock and concrete. The sediment remedy also included the regrading and capping of the riverbank with two feet of topsoil. Revegetation of the capped riverbank with native trees and shrubs will occur in February 2006 after the soil has been stabilized with the native grasses planted in November 2004. A portion of the contaminated sediments along two high pressure sewer lines owned by the City of Portland is planned to be capped in the summer of 2005 when the City of Portland completes repair work on the sewer lines.

DEQ and EPA expect to achieve "Construction Completion" for remedy implementation in September 2005, following repair and capping of the high pressure sewer main and construction of the soil cap. In total DEQ and EPA will have spent approximately $33 million in reaching the Construction Completion milestone.

The Department of Environmental Quality (DEQ) entered into a Superfund State Contract in 1996 and a subsequent series of Cooperative Agreements in which the United States Environmental Protection Agency (EPA) provides funds to the DEQ in order to perform environmental remedial actions at the former McCormick and Baxter Creosoting Company site.

In accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104, Public Law 99-499, 42 U.S.C. 9601 et. seq., the State of Oregon, Department of Environmental Quality (DEQ) is responsible for undertaking implementation of remedial design and remedial action (RD/RA) at the site.

The current Cooperative Agreement provides $26,821,724 in funding for the RD and RA activities to be performed by DEQ, on behalf of the State of Oregon, that are necessary to achieve Construction Completion. These activities include:

- Completion of a Remedial Design for installation of a soil cap.
- Preparation of a threatened and endangered species Biological Assessment to be provided to the National Marine Fisheries Service (NMFS) and US Fish and Wildlife Service (USFWS).
- Installation of a cap over all soil at the Site that exceeds risk-based or background concentrations.
- Continued monitoring to ensure that groundwater cleanup goals are met at compliance monitoring locations.
- Installation of a vertical physical barrier wall to control NAPL discharge to the Willamette river.

- Evaluation by pilot testing of innovative technologies to increase the effectiveness and rate of NAPL removal.
- Preparation of a threatened and endangered species Biological Assessment to be provided to the National Marine Fisher Services (NMFS) and US Fish and Wildlife Service (USFWS).
- Completion of the Pre-final/Final Remedial Design for capping near-shore contaminated sediments, the removal of the former creosote dock bulkhead, and the layback of the site riverfront bankline.
- Coordinating the timing of the placement of the cap with the effectiveness evaluation of the groundwater remedy.
- Obtainment from the Oregon Division of State Lands of a permanent easement and temporary construction easement prior to construction of the sediment cap.
- Construction of a 23 acre sediment cap that exceeds ROD specified cleanup levels.
- Preparation of an Explanation of Significant Difference.
- On-going management of the RD/RA activities for the selected remedy, as amended.
- On-going communication and coordination with internal and external programs and agencies, including, but not limited to DEQ's RCRA and Water Quality Programs, the National Marine Fisheries Service (NMFS), U.S. Fish & Wildlife Service (USFWS), Oregon Dept. of Fish & Wildlife (ODFW), U.S. Army Corps of Engineers (USACE), City of Portland, Port of Portland, Metropolitan Service District (Metro) and EPA.
- Coordination and support of EPA's requirement for Endangered Species Act Consultation with NMFS and USFWS, concerning planned construction activities at the site, including the soil cap, sediment cap and barrier wall.
- Support of EPA's requirement for consultation with Native American Tribes, in accordance with the National Historic Preservation Act, the Archeological Resources Protection Act, and the Native American Graves Protection and Repatriation Act.
- On-going community relations activities, including issuance of semiannual fact sheets, and periodic community meetings and workshops, as appropriate.
- Tracking of progress toward major milestones and budgets, and submission of quarterly status reports to EPA.
- Initiation of discussions/negotiations with adjacent property owners, as needed, concerning property access for RD/RA implementation.

As of June 2005, the remaining activities to be performed are construction of the soil cap and completion of the sediment cap over two City of Portland high-pressure sewer mains that run along the Willamette River bottom at the site.

In Winter 2003/2004, DEQ, through DAS, issued a Public Improvement ITB for construction of the sediment cap at the site. As a result of the ITB process, DEQ entered into a contract with Remtech, Inc., in March 2004 for construction of the sediment cap. The work commenced in late June 2004 and was scheduled for completion in October 2004.

Based on data provided by the City of Portland to DEQ at the time of sediment cap design, two high-pressure sewer lines belonging to the City crossed the area where sediment cap construction was to occur. These two high-pressure sewer lines were expected to run underneath the river sediments. During the course of the sediment cap construction in the Willamette River, DEQ

discovered that the two high-pressure sewer lines were exposed above the river bottom. The exposed sewer lines created a major environmental and public safety threat, and compromised DEQ's ability to construct the sediment cap in the area of the exposed sewer lines.

DEQ advised the City of Portland that the sewer lines were exposed and, with the concurrence of the City, DEQ advised Remtech, Inc., to perform no sediment cap construction activities in the areas adjacent to the sewer lines alignment.

The City of Portland has been evaluating the risks related to the exposed sewer lines and has assigned its staff to develop a design to address the risks. In short, the City's design requires that the exposed high pressure sewer lines be stabilized and covered in a manner that will allow DEQ to then complete the construction of the sediment cap. The total area of the sediment cap that is yet to be constructed is approximately 1.4 acres (approximately 21 acres were capped in 2004).

DEQ coordinated closely with the City of Portland during the Winter and Spring of 2005 to identify appropriate design approaches to remedy the risks associated with the exposed sewer lines, as well as to develop a collaborative approach to construct both the City's protection of the sewer lines and DEQ's last element of the sediment cap that was to have been completed by October 31, 2004. DEQ and the City proceeded in good faith to finalize their respective designs and to develop an Intergovernmental Agreement (IGA) that would provide for the City to competitively procure a construction contractor to perform the activities necessary to protect the sewer lines, and which would also provide for the City's contractor to construct the sediment cap elements necessary to complete DEQ's RA as required by DEQ's agreement with EPA.

On April 8, 2005, the City of Portland informed DEQ that it would not be able to enter into the IGA due to administrative constraints.

In order for DEQ to fulfill its obligations to EPA and to protect human health and the environment, it is critical that the sediment cap RA be constructed in the Summer of 2005. However, prior to DEQ completing its sediment cap construction, the City must first complete its stabilization and covering of the two exposed high-pressure sewer lines.

NOAA Fisheries is responsible for ensuring that work performed in the Willamette River does not jeopardize salmon and steelhead populations listed as threatened under the federal Endangered Species Act. In consultation with EPA, NOAA Fisheries issued a Biological Opinion that restricts sediment cap construction at the McCormick & Baxter Site to the period of July 1 to October 31, 2004 or 2005. The Biological Opinion also allows for a short winter construction period. However, construction during this winter period would be subject to adverse weather. It is anticipated that NOAA Fisheries will designate the same "in-water" work windows to the City of Portland. As such, the City of Portland will not be allowed to commence its sewer line repairs until at least July 1, 2005. Furthermore, the City is continuing to finalize its design and its Invitation to Bid.

Because of the significant threats to human health and the environment posed by the exposed high-pressure sewer lines, the City of Portland has initiated its procurement process based on the Emergency Procurement rules in the City of Portland City Code Section 5.33.130. Under

authority granted by the City of Portland Mayor, the City has proceeded to request prequalification documents from eight potential contractors—some of whom were plan holders for the original sediment cap ITB, and has determined that five of the contractors who submitted prequalification documents are qualified to bid on the work. The City has issued its ITB, bids are due on June 8, 2005, and the City expects to award its construction contract for the sewer line repairs on or about June 9, 2005. The City's selected construction contractor will then mobilize and commence in-water construction activities on or about July 1, 2005. The City currently estimates that its in-water construction should be complete on or about August 12, 2005; however, the City acknowledges that the actual completion date could vary either way by several weeks.

In order for DEQ to complete its sediment cap remedial action construction prior to the end of the current Cooperative Agreement with EPA (September 30, 2005) and, in order to fulfill an agreement by Oregon's Governor, the President of the United States, and the EPA that all RA activities at the site be completed by September 30, 2005, it is imperative that DEQ commence construction of its final sediment cap element by approximately the first week of August 2005 or immediately following the completion of the sewer line repairs by the city's selected contractor. DEQ currently estimates that construction of the sediment cap element will take approximately four to six weeks. In addition, the work must be completed by September 15, 2005, in order for DEQ and EPA to complete all final inspections and all necessary reporting and RA close-out documentation prior to September 30, 2005.

The scope of the work necessary to complete the sediment cap RA requires that the City of Portland first stabilize its exposed high-pressure sewer lines, after which a contractor procured by DEQ will place approximately two feet of sand cap over the entire area that remains uncapped from last summer's sediment cap activities. The two-foot sand cap will then be overlain with various thicknesses of rock and rip-rap designed to withstand the hydraulic conditions existing in that part of the Willamette River. The resulting sediment cap is designed to be protective of human health and the environment.

Oregon Statutes require that Public Improvement contracts be selected based on competitive bidding, and that the resulting contract be awarded to the lowest responsive, responsible bidder, unless an exemption is granted.

This exemption will grant DAS the authority to act on behalf of DEQ to negotiate the sediment cap RA public improvement contract with the same contractor competitively selected by the City of Portland to perform the City's construction necessary to stabilize the exposed high-pressure sewer lines in the Willamette River, offshore of the McCormick and Baxter Federal Superfund site.

Funding for the construction of the site sediment cap RA is approved and provided to DEQ under its Cooperative Agreement No. V-990601-03.

II
FINDINGS REGARDING REQUIRED INFORMATION

ORS 279C.330 provides that: "*'[F]indings' means the justification for a contracting agency conclusion that includes, but is not limited to, information regarding: (a) Operational, budget and financial data; (b) Public benefits; (c) Value Engineering; (d) Specialized expertise required; (e) Public safety; (f) Market conditions; (g) Technical complexity; and (h) Funding sources.*" DAS finds that many of these criteria support the decision to allow DEQ to negotiate and enter into a contract with the contractor competitively selected by the City of Portland to perform its high-pressure sewer line stabilization activities. This finding is supported by the following:

A) Operational, Budget and Financial Data: Funding for this work is being provided under a Cooperative Agreement between DEQ and the EPA. The Cooperative Agreement end date is September 30, 2005. The work consists of a variety of complex tasks and time-critical activities that the contractor must perform. Demonstrated expertise working in dynamic river conditions is mandatory to guarantee the success of this work. This work will require a high degree of skill in planning and organizing, procuring materials, and placing materials in the river in a manner that is both safe and protective of federally listed threatened salmon and steelhead species, while meeting the strict design tolerances of the RA. This work must be completed by September 15, 2005, if at all possible. Utilizing the construction expertise of an experienced marine construction contractor that has just completed sensitive in-water work in the same area as the area to be capped will ensure that lessons learned can be applied, mobilization costs can be minimized, commencement can immediately follow the completion of the work performed by the City, and there will be no possibility of two contractors competing to work in the same area of the river at the same time. Additionally, if for any reason the City's sewer line contractor encounters delays, the State will not be faced with potential delay claims and costs of its contractor. Conversely, if the City's sewer line contractor finishes ahead of its planned schedule, the State will be able to immediately commence in-water construction of the time-critical and environmentally sensitive sediment cap.

B) Public Benefits: Contracting with the same contractor selected by the City of Portland to perform its sewer line work rather than following a bidding approach will not only allow for a seamless transition from the City's sewer line work to DEQ's sediment cap work, it also will ensure that the timelines, which are a critical element of this work, can be met. It is highly doubtful that competitive bidding could be accomplished in time to allow the work to be completed by the mid-September 2005 deadline. Additionally, it is expected that negotiating a contract with a contractor that has already committed resources to completing the City's sewer line work will result in cost savings to the state, both in contract costs and in the amount of agency time and resources that would be required. The public benefit of this negotiated process is the ability to promptly protect human health and the environment because the completed cap will eliminate the possibility of human contact with the contaminated sediment at the site. This negotiated process also will permit DEQ to obtain the construction of a better sediment cap at a lower cost, to

utilize funding provided by EPA under the current Cooperative Agreement that is scheduled to expire on September 30, 2005, and to ensure that the work can be completed in 2005, falling within the ESA-mandated fish window.

C) Value Engineering: Using the same contractor as that selected by the city will eliminate the need to remobilize some equipment to the worksite. Avoiding duplicity of work is expected to provide a significant cost benefit to the capping project.

D) Specialized Expertise Required: The project requires the specialized knowledge of marine construction techniques in a riverine environment. Experience with similar projects, and particularly familiarity with underwater conditions in the same location in the period immediately preceding the construction of this sediment cap, will bring significant tangible benefits to this work. The City of Portland has followed a prequalification process of evaluating the qualifications of a number of marine construction contractors, and has selected five bidders that possess demonstrated expertise in similar work. By negotiating a contract with the pre-qualified contractor that submits the lowest responsive and responsible bid to the City of Portland, the State will ensure that it is contracting with a company that has demonstrated experience and recent history of competitive bids for similar work.

E) Public Safety: The City's contractor will already be implementing plans and methods to protect the public, both from the physical hazards of having vessels on the water and by protecting the public from contaminant releases. Also, the public will have become accustomed to the presence of construction activities, which will be continuous, if the same contractor is employed for both projects.

F) Market Conditions: Mid-summer is a very busy time for marine construction contractors. There is a limited number of marine construction contractors that possess the required experience and have the resources available to perform this time-critical work. The City of Portland has accounted for this by soliciting pre-qualifications from eight potential marine contractors; and has invited five of those bidders to submit bids for the city's work. Securing a contractor that is already mobilized and which has committed resources to undertake the City's work should greatly enhance the likelihood of obtaining a competitive price for the comparable State work at the same site.

G) Technical Complexity: The sediment capping activities require specialized methods, some of which will be employed during the sewer line stabilization work. Anchoring of vessels is restricted and is not allowed in the previously capped areas nor at the sewer lines themselves. The city's contract documents include these restrictions. Because the work is very site-specific, the contractor for both projects must have sophisticated positioning equipment as well as the means to verify the completeness of the work. The sediment cap materials must be placed to produce minimal sediment resuspension and to minimize turbidity in the river. The delicate nature of stabilizing active high-pressure sewer lines will require similar skills.

H) Funding Sources: Governor Kulongoski and President Bush discussed this project in August 2003. In September 2003, the EPA agreed to enter into a Cooperative Agreement with DEQ for implementation of the sediment cap construction. An agreement by DEQ and EPA provided for the work to be completed by Fall 2005. Although most of the sediment cap was constructed in 2004, the unexpected discovery of the exposed high-pressure sewer lines required that a part of the sediment cap construction be postponed until after the City of Portland properly stabilized its sewer lines. Funds which remain unexpended from the 2004 sediment cap construction are available to fund the construction of the final element of the sediment cap to be performed in summer of 2005.

III
FINDINGS ADDRESSING EXEMPTION REQUEST

In accordance with OAR 125-249-0630, the agency shall prepare written findings to support the use of the negotiated contracting method, addressing as many of the following items as are applicable:

A) Nature of the Project: The project is described as the last phase of construction of a multi-layer sediment cap over submerged sediments in the Willamette River adjacent to the McCormick and Baxter Creosoting Company Superfund Site in Portland.

B) Estimated Construction Cost: The estimated cost of construction of the sediment cap is approximately $400,000.

C) Substantial Cost Savings: Cost savings are expected to accrue to the State by the use of a negotiated contract with the same marine construction contractor competitively procured by the City of Portland to stabilize its exposed high-pressure sewer lines that cross the sediments required to be capped by the State. Contracting with a marine construction contractor that is already mobilized in the same location (for the City), that is able to transition directly from the City's work to DEQ's work, and that has very recent experience working in the dynamic underwater conditions that will affect the ability to safely and efficiently complete the work adjacent to the McCormick and Baxter Superfund site will result in additional cost savings attributable to reduced procurement costs, more efficient oversight costs, and potential economies of scale.

D) Findings supporting why it is unlikely that an exemption from competitive bidding would encourage favoritism or diminish competition for the public contract: The procurement process being utilized by the City of Portland is based on competitive bidding among a slate of pre-qualified marine construction contractors. It is the objective of the State to negotiate a contract with this competitively selected marine construction contractor.

IV
FINDINGS REGARDING COMPETITION

ORS 279C.335(2) requires that an agency make certain findings as a part of exempting certain public improvement contracts or classes of public improvement contracts from competitive bidding. ORS 279C.335(2)(a) requires an agency to find that: "*It is unlikely that the exemption will encourage favoritism in the awarding of public improvement contracts or substantially diminish competition for public improvement contracts.*" DAS finds that selecting the McCormick and Baxter Marine Construction Contractor through an exempted selection process in accordance with OAR 125-249-620 and 125-249-0630 will not inhibit competition or encourage favoritism. This finding is supported by the following facts:

A) Full Disclosure and Competitive Bidding: DEQ's negotiation of a contract with the contractor selected by the City of Portland to perform work at the same site will neither encourage favoritism in the award of public improvement contracts nor diminish competition for public improvement contracts because the City will award its contract in full compliance with the competitive bid requirement of ORS 279C.335(1). DEQ's selection of a contractor will, in turn, depend on the result of the competitive bid process conducted by the City. To ensure full disclosure of all project requirements to the five pre-qualified contractors[1] invited to submit bids, the Invitation to Bid (ITB) solicitation package issued by the City included the following elements:

1) A detailed description of the project

2) Contractual terms and conditions

3) A selection process description

4) Evaluation criteria

5) A complaint process and remedies

B) Selection Process: The selection process employed by the City for its contract provides that the City's contract award will be made to the lowest responsive, responsible bidder, as required by ORS 279C.375(1). DEQ will attempt to negotiate a contract with the firm selected by the City to construct the City's sewer line repairs. If negotiations are not successful, negotiations will be conducted with the City's next lowest responsive and responsible bidder. Therefore, the competitive bidding process (as contemplated by ORS 279C.335(1)) that the City will conduct will determine the eligibility of a contractor to negotiate for the award of the contract with DEQ. For these reasons, DEQ's award of a negotiated contract to the contractor selected by the City will not either encourage favoritism in the award of public improvement contracts or diminish competition for those contracts

[1] Pursuant to the City of Portland ordinances PCC 5.33 and 5.34, the City used the pre-qualification process authorized by ORS 279C.430. That pre-qualification process resulted in the City's determination that of the eight marine construction contractors the City originally solicited, five were qualified to bid on the City contract. The City's ITB has been issued to those five pre-qualified contractors.

C) Wage Rates and Contract Terms: Standard terms and conditions of Oregon Public Improvement Contracts apply; however, the standard terms and conditions will be supplemented or modified to address specific provisions required by the EPA. These requirements are generally addressed in 40 CFR Part 35, Subpart O. Additionally, federal Davis-Bacon wages will apply to the work contracted by DEQ. (The City's sewer line repair contract will be subject to the State of Oregon Prevailing Wage Rate Law).

V
FINDINGS REGARDING SUBSTANTIAL COST SAVINGS

ORS 279C.335(2) requires that a public agency make certain findings in requesting approval of the exemption of a certain public improvement contract or class of public improvement contracts from competitive bidding. ORS 279C.335(2)(b) requires an agency to find that "*The awarding of public improvement contracts under the exemption will result in substantial cost savings to the contracting agency.*" This finding is supported by the following facts:

A) Reduced Mobilization Costs: A negotiated contract with the city's contractor will eliminate the need for a second mobilization to the project site. Specifically, vessels and equipment to import and place material for the City's sewer line stabilization already will be engaged at the site and, when no longer needed on the project for the City, can be used immediately for capping material importation and placement on the DEQ project. Therefore, the costs of a second mobilization of a contractor at the site will be eliminated, and these savings will be reflected in the price of the DEQ contract.

Moreover, because the contractor already will be in place, DEQ's oversight staff will not be needed until capping work actually begins, instead of being required in advance to oversee the contractor's mobilization activities. This reduction in DEQ's project supervision expenses also will represent significant cost savings to DEQ.

B) Similarity between City and DEQ Projects: The two projects are complex in their own ways, but also share commonalities. Under the City's contract, the contractor will need to use special anchoring techniques to stay off of the existing cap and avoid the sewer lines. The methods the contractor develops for the City's project can then be used for the capping anchoring on the DEQ project, which will have similar restrictions. Thus, the costs of planning and the material purchases for the contractor's anchoring system will be eliminated for DEQ's project. In other words, the negotiation of a contract with the City's contractor under the requested exemption will eliminate the expense of designing and assembling a second anchoring system, so these cost savings also will be reflected in a reduction in the price of the DEQ contract.

Special placement techniques are required for placement of the capping materials. For the City's project, the contractor will not only need to use careful placement at the sewer lines, but it will need to develop a system to mix gravel into the underlying sediments. Because

the City's contractor will need to take into consideration the site dynamics (such as currents and tidal influences) for the stabilization project, the Contractor will already be up to speed for planning its capping construction techniques for the DEQ project and will have demonstrated the ability to address complex marine construction issues. Again, the preparation needed for the City's project will significantly shorten the learning curve for the capping project, thereby reducing engineering and planning expenses that relate to the DEQ project.

Positioning and spatially locating the work to be done is another necessary construction activity that will benefit by having the same contractor construct both projects. The contractor's equipment will already be in place, the site will be familiar to the contractor's operators, and the contractor will possess, and can readily employ, the technical information derived from the first project for the DEQ capping project. That is, the contractor will have already documented the interim surfaces in the course of the City's project, and that data will be ready for use on the DEQ project without the need for a data transfer to a separate contractor.

C) Similar Restrictions: The two projects, because the work is in the same area, share many of the same restrictions. The anchoring restrictions mentioned above are an example of this. Environmental restrictions are also similar. The same permitting restraints will apply to both projects and the safeguards - both in terms of equipment and planned courses of action to minimize environmental impacts - will only need to be derived once. The DEQ will realize savings in material costs as well as in planning time and resources.

D) Simultaneous Implementation of Activities: By contracting with the City's contractor in advance of mobilization for the City's project, the contractor might be able to perform some of the work simultaneously to minimize equipment and worker down-time. The sewer line work is in a small portion of the area to be capped and working simultaneously need not cause interfere between the two projects. Thus, the contractor's supervising staff can be shared for both projects.

E) Econom y of Scale in Procuring Equipment and Materials: Using the City's contractor for the capping project also can be predicted to result in significant economy of scale in procuring equipment and material if the contract for capping can be negotiated in a timely manner. Specifically, the vessels required for the sewer line stabilization project can be committed for a longer length of time and used continuously over the time of the two projects. Familiarity with the City's project will facilitate the vessels' use for the DEQ capping activity. The supplier of the gravel material for the sewer line stabilization may be able to provide many or all of the materials for capping. The larger material quantities and prior arrangements for delivery should result in a cost savings due to the need to acquire larger total volumes for the two projects, as opposed to one.

F) Compressed Time Scale: By contracting with the same company, the timeline for the work can be significantly shortened. If the contractor is able to perform work on both the City and the DEQ projects simultaneously, there may be less down-time for the contractor's staff. For instance, during portions of the City's sewer line stabilization project, sand

placement for the DEQ project may be able to occur in another area. By the time the stabilization project is complete, vessels and workers may be able to armor the capped area while sand placement occurs in the stabilized area. This would facilitate completion of the capping activities, giving DEQ time to develop the reports before the EPA deadline and eliminate the resources needed to request a contract extension. The simultaneous construction might also minimize DEQ's oversight requirements. Oversight of the initial capping work would enable DEQ and the contractor to establish the oversight protocol. As the capping work ramps up to several activities in multiple places, it may be that the comfort level with the established procedures will mean that fewer DEQ oversight staff will be required.

G) Reduced Transactions Costs: Finally, by contracting directly with the City's competitively-selected contractor under the requested exemption, DEQ will realize the savings of the expenses that otherwise will be spent in developing the solicitation documents, publishing advertisements for bids, and conducting a redundant bidder - selection process to award a contract for the DEQ project.

VI
SUMMARY

A negotiated contract for the construction of a multi-layer sediment cap over submerged sediments in the Willamette River adjacent to the McCormick and Baxter Creosoting Company Superfund Site in Portland is the most appropriate way to obtain, in a timely manner, the critically necessary construction expertise of an experienced marine construction contractor that has just completed sensitive in-water work in the same area as the area to be capped. Additionally, this will ensure that lessons learned can be applied, mobilization costs can be minimized, commencement can immediately follow the completion of the work performed by the City, and the possibility of two different contractors interfering with each other's work in the same area of the river at the same time will be eliminated. Additionally, an exemption from competitive bidding requirements is justified under the criteria outlined in ORS 279C.335(2), findings have been developed in compliance with ORS 279C.330, and the DEQ will perform the post-project evaluation required by ORS 279C.355. Based upon the previously listed findings, the Department specifically concludes that:

A) Following the described selection process, an exemption is unlikely to encourage favoritism in the awarding of public contracts or substantially diminish competition for public contracts; and

B) Award of a public contract pursuant to the exemption will result in substantial cost savings to the public contracting agency.

The Oregon Department of Environmental Quality submits that this request meets all of the criteria above and requests approval of this exemption. If you have any questions, please call Steve Campbell at DEQ, (503) 229-5860.

Sincerely,

Steve Campbell for ALAN D. KIPHUT 6/27/05

Alan D. Kiphut

Administrator, Land Quality Division

Oregon Department of Environmental Quality

Reviewed by Department of Justice:

06/27/05 _____

Date Assistant Attorney General

B

Sediment Cap Construction Record Drawings

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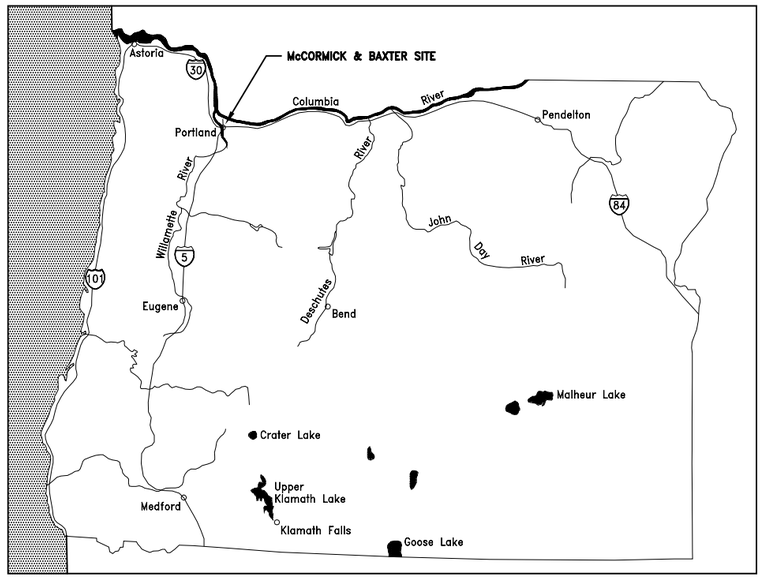
McCORMICK AND BAXTER CREOSOTING CO. SITE

PORTLAND PLANT

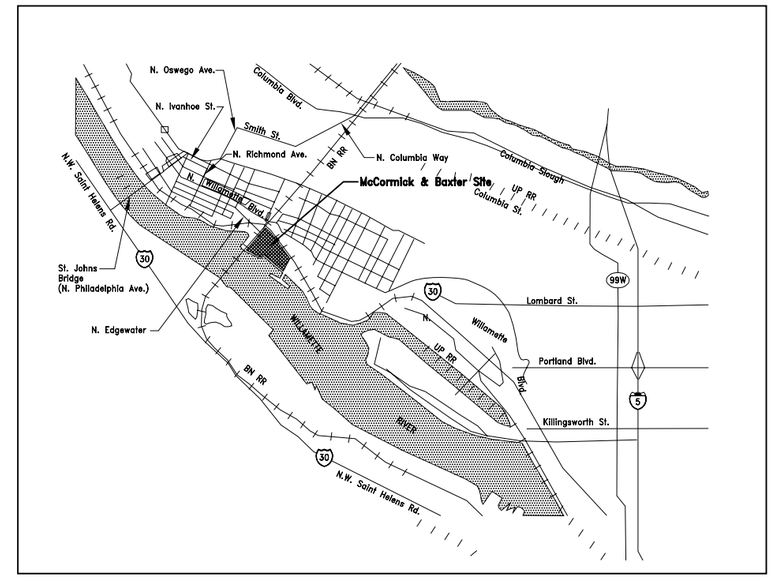
Portland, Oregon

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS



VICINITY MAP

INDEX OF DRAWINGS	
DRAWING NUMBER	
1 OF 5	TITLE SHEET: SITE LOCATION
2 OF 5	ARMOR FEATURES
3 OF 5	SUBARMOR FEATURES
4 OF 5	CONSTRUCTION (AUGUST THROUGH OCTOBER 2005)
5 OF 5	GENERAL NOTES



SITE LOCATION MAP

Prepared for:

OREGON DEPARTMENT
OF
ENVIRONMENTAL QUALITY

LAND QUALITY DIVISION

811 SW Sixth Ave.
Portland, Oregon 97204

by:

Ecology and Environment, Inc.
333 SW Fifth Ave.
Portland, Oregon 97204

REVISIONS

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY:

CHECKED BY:

DRAWN BY: S. STEVENS

APPROVED BY A. WHITMAN

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS

TITLE SHEET
SITE LOCATION

McCORMICK & BAXTER
CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	CAD. FILE NO.	DRAWING NO.
NOTED	5-2-06	Record Drawing.dwg	1 of 5

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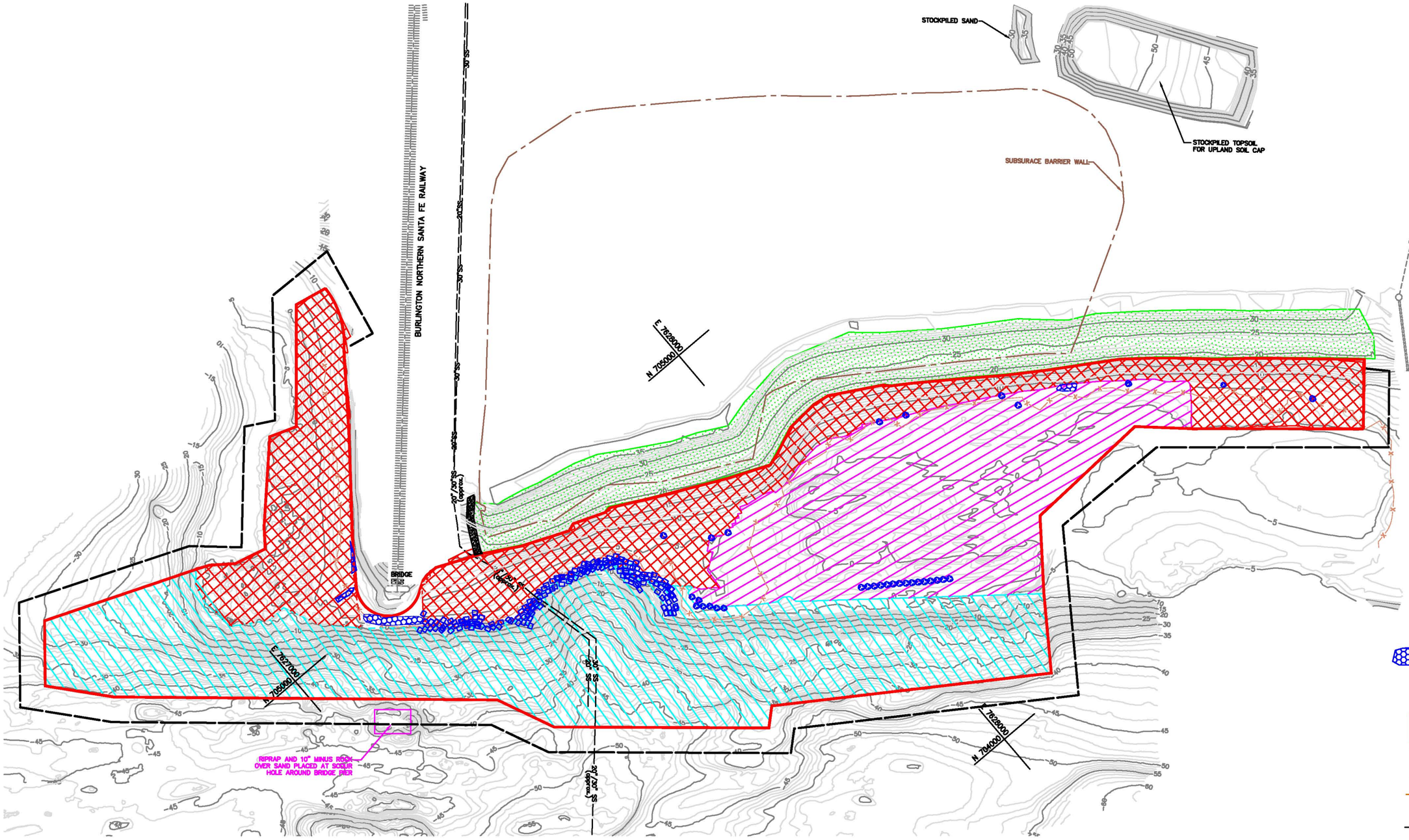

LEGEND:

- DSL EASEMENT (#31530-EA)
- SAND CAP BOUNDARY
- ARTICULATED CONCRETE BLOCK
- 6-INCH MINUS ROCK ARMOR
- 10-INCH MINUS ROCK ARMOR
- RIPRAP ARMOR (ELEVATIONS NOT SURVEYED)
- RIPRAP ARMOR
- BOULDER CLUSTERS AND ROCK MOUND
- TURF REINFORCEMENT MAT
- GRAVEL ROAD
- SURVEY DATUM BOUNDARY (CRD/NGVD)
- SS — HIGH PRESSURE SEWER LINE
- STM — STORM SEWER

NOTES

1. FEATURES LANDWARD OF TOP OF BANK DO NOT REFLECT CONSTRUCTION PERFORMED IN 2005.
2. BATHYMETRY SHOWN ON THIS DRAWING SHOULD NOT BE USED FOR NAVIGATIONAL PURPOSES.
3. FOR OTHER NOTES, SEE SHEET 5.

SCALE IN FEET: 0 100 200 300

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
APPROVED BY: A. WHITMAN

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS

ARMOR FEATURES
AS OF NOVEMBER 2005

McCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.	DRAWING NO.
NOTED	5-2-06	Record Drawing.dwg	2 of 5

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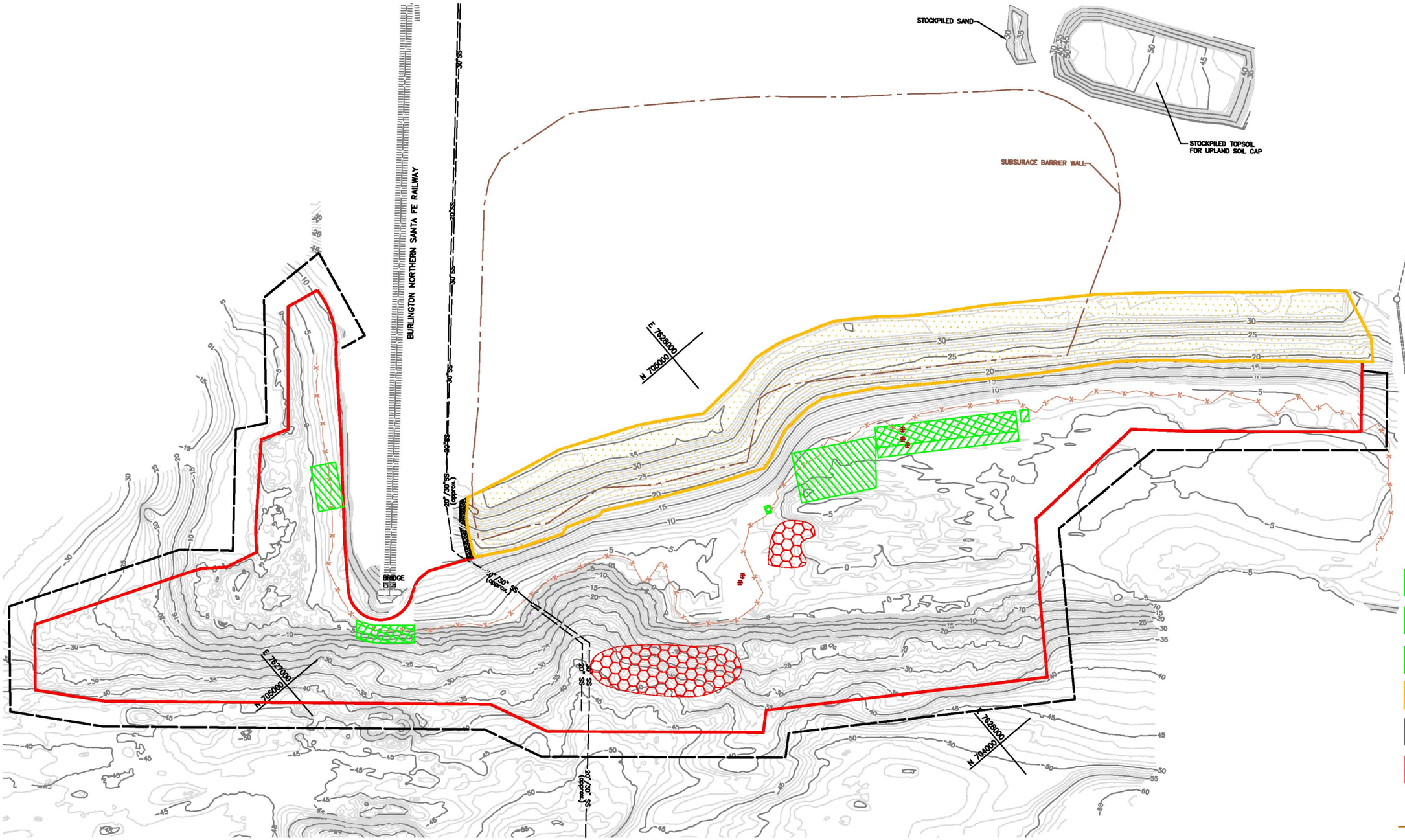

LEGEND:

- DSL EASEMENT (#31530-EA)
- SAND CAP BOUNDARY
- ORGANOCLAY MAT (DOUBLE LAYER)
- ORGANOCLAY MAT (SINGLE LAYER)
- GRANULAR ORGANOCLAY
- SOIL CAP (IMPORTED TOPSOIL)
- GRAVEL ROAD
- HOT SPOT TREATMENT (THICKENED SAND LAYER)
- "BLISTER" REPAIR
- SURVEY DATUM BOUNDARY (CRD/NGVD)
- SS — HIGH PRESSURE SEWER LINE
- STM — STORM SEWER

NOTES

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SCALE IN FEET: 0 100 200 300

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Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
APPROVED BY: A. WHITMAN

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS

SUBARMOR FEATURES
AS OF NOVEMBER 2005

McCORMICK & BAXTER
CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.	DRAWING NO.
NOTED	5-2-06	Record Drawing.dwg	3 of 5

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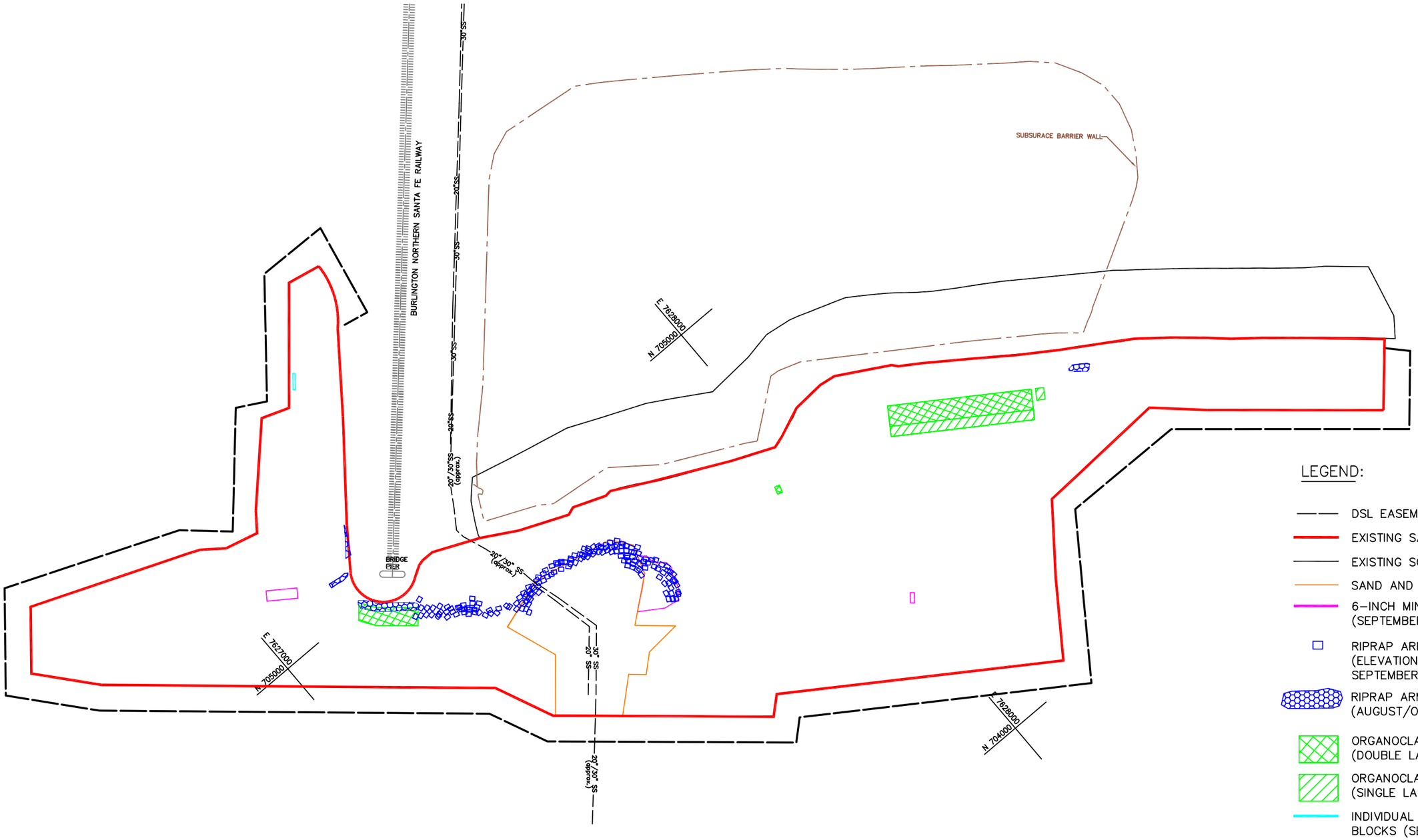

LEGEND:

- DSL EASEMENT (#31530–EA)
- EXISTING SAND CAP BOUNDARY
- EXISTING SOIL CAP BOUNDARY (RIVERBANK)
- SAND AND ARMOR (AUGUST 2005)
- 6–INCH MINUS ROCK ARMOR (SEPTEMBER 2005)
- RIPRAP ARMOR (ELEVATIONS NOT SURVEYED; SEPTEMBER 2005)
- RIPRAP ARMOR (AUGUST/OCTOBER 2005)
- ORGANOCLAY MAT (DOUBLE LAYER; AUGUST/OCTOBER 2005)
- ORGANOCLAY MAT (SINGLE LAYER; AUGUST/OCTOBER 2005)
- INDIVIDUAL ARTICULATED CONCRETE BLOCKS (SEPTEMBER 2005)
- — SS — HIGH PRESSURE SEWER LINE
- – – STM – – STORM SEWER

NOTES

FOR NOTES, SEE SHEET 5.

SCALE IN FEET: 0 100 200 300

REVISIONS

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
APPROVED BY A. WHITMAN

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS
CONSTRUCTION
AUGUST 2005 THROUGH OCTOBER 2005
McCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.	DRAWING NO.
NOTED	5–2–06	Record Drawing.dwg	4 of 5

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GENERAL:

1. The work reflected on these Drawings was completed by the following construction contractors:
   a. Remtech, Inc. (Remtech) from June through November 2004. During the construction, a City of Portland sewerline system (2 high–pressure pipes) was found to be exposed within the area of the sediment cap. The scope of Remtech's work was modified to eliminate this area.
   b. Advanced American Construction, Inc. (AAC) completed sewerline system repairs under contract to the City of Portland July through August 2005. The details of this work are not shown on these Drawings since they were performed under a contract not subject to DEQ or EPA direction. However, the drawings are included as an appendix to the 2005 Sediment Cap Construction Summary Report.
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      ii. In very shallow areas–by conventional dry land construction techniques.
      iii. In shallow areas–by reverse dredge.
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      ii. In shallow areas–by conventional dry land construction techniques.
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   d. 6–Inch Minus Rock
      i. Deep area placement–by clamshell bucket from crane barge or by dump box from barge.
   e. 10–Inch Minus Rock
      i. Shallow area placement–by conventional dry land construction techniques.
   f. Riprap (includes 24–inch minus rock)
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   a. All site surveys were performed by David Evans and Associates, Inc. (DEA). DEA was subcontracted to each of the construction contractors as well as Ecology and Environment, Inc. (E & E). The Sediment Cap Record Drawings are based upon DEA surveys, augmented by information provided by the construction contractors and their subcontractors, and by QA data collected by E&E. Subsurface visual information was provided by divers.
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   b. Quality Assurance (QA) methods varied by the type of material being placed, the depth of the water, and an assessment of the effectiveness of the contractors' quality control methods.
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2. The legally recorded Oregon Department of State Lands (DSL) easement is contained in an appendix to the 2004 Sediment Cap Construction Summary Report.

3. Coring was performed to verify adequate sand cap thickness during 2004 and 2005 construction. This QA data is presented in figures included in the 2004 and 2005 Sediment Cap Construction Summary Reports. As verified through construction oversight, sand was placed approximately to the design thickness of 2 ft., or more where it was called for in the design, within the approximate sediment cap edge.

4. As verified through construction oversight, 6–inch minus rock was placed to the design thickness of 12 inches during 2004 Sediment Cap Construction, and 8 inches during 2005 Sediment Cap Construction (approximately).

5. As–built ACB was surveyed by DEA as part of the 2004 Upland Survey. The in–water ACB edge in Willamette Cove was further delineated from an inspection performed by Advanced American Diving Service, Inc. (AAD) in August 2005.

6. As verified through construction oversight, 10–inch minus rock was placed within the area outlined to the design thickness of 1.25 ft. (approximately) during 2004 Sediment Cap Construction. The extent of 10–inch minus rock was delineated from an inspection performed by AAD in August 2005.

7. As verified through construction oversight, riprap was placed where indicated to the design thickness of 2–3 ft.

8. As verified through construction oversight, an approximate 4–inch thick gravel filter layer underlies the ACB, 10–inch minus rock, and riprap. Where placed directly over ACB, riprap was not necessarily underlain by gravel filter and rock armoring.

9. The river bed is affected by tidal influences, flow rates, wind waves, and vessel wakes and washes. Although there were no particular severe events noted during the construction period, the extent and thickness of layers of material could have been affected by the above influences if the armor (final) layer of material was not placed over the other layers immediately.

Subarmor Features (Sheet 3)

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ecology and environment, inc. International Specialists in the Environment Portland, Oregon		SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS	
DESIGNED BY:		GENERAL NOTES	
CHECKED BY:		McCORMICK & BAXTER CREOSOTING CO. PORTLAND, OREGON	
DRAWN BY: S. STEVENS	APPROVED BY A. WHITMAN	SCALE NOTED / DATE ISSUED 5–2–06 / C.A.D. FILE NO. Record Drawing.dwg	DRAWING NO. 5 of 5

REVISIONS

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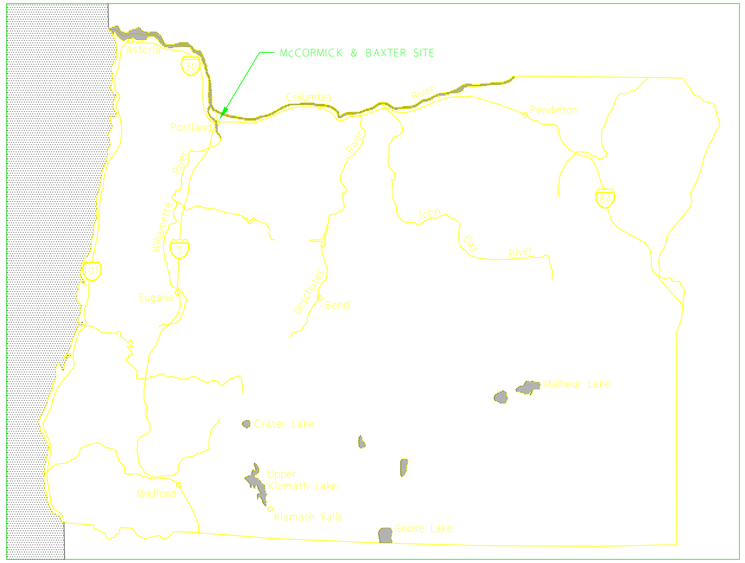
BURLINGTON NORTHERN SANTA FE RAILWAY
20"SS
30"SS
30"SS
WOOD
DEBRIS
PILE
E 7628000
N 705000
EDG
FAB
LANDSIDE TOE OF
GAP BETWEEN ACB MATS
MYNDIVE SURVEY 2005

McCORMICK AND BAXTER CREOSOTING CO. SITE

PORTLAND PLANT

Portland, Oregon

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS



VICINITY MAP

INDEX OF DRAWINGS

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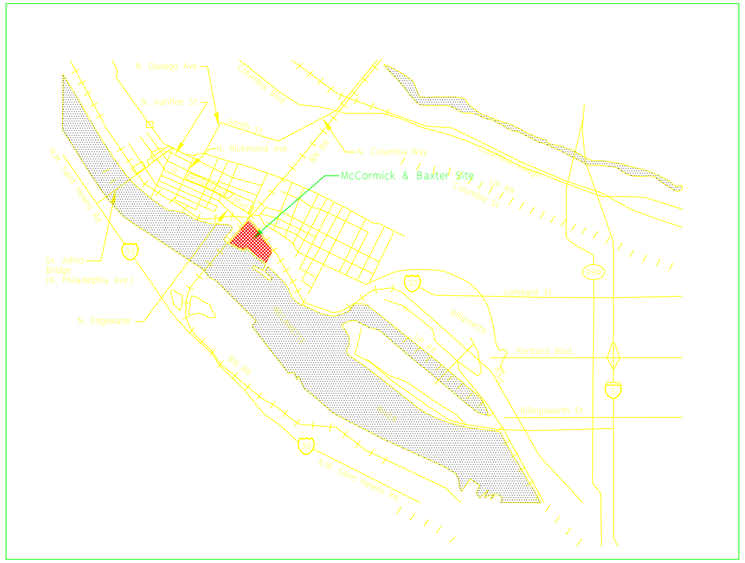
1 OF 5	TITLE SHEET: SITE LOCATION
2 OF 5	ARMOR FEATURES
3 OF 5	SUBARMOR FEATURES
4 OF 5	CONSTRUCTION (AUGUST THROUGH OCTOBER 2005)
5 OF 5	GENERAL NOTES



SITE LOCATION MAP

Prepared for:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

LAND QUALITY DIVISION

811 SW Sixth Ave.
Portland, Oregon 97204

by:

Ecology and Environment, Inc.
333 SW Fifth Ave.
Portland, Oregon 97204

ecology and environment, inc. International Specialists in the Environment Portland, Oregon		SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS TITLE SHEET SITE LOCATION McCORMICK & BAXTER CREOSOTING CO. PORTLAND, OREGON	
DESIGNED BY:			
CHECKED BY:			
DRAWN BY: S. STEVENS	APPROVED BY A. WHITMAN	SCALE NOTED / DATE ISSUED 5-2-06 / C.A.D. FILE NO. Record Drawing.dwg	DRAWING NO. 1 of 5

REVISIONS

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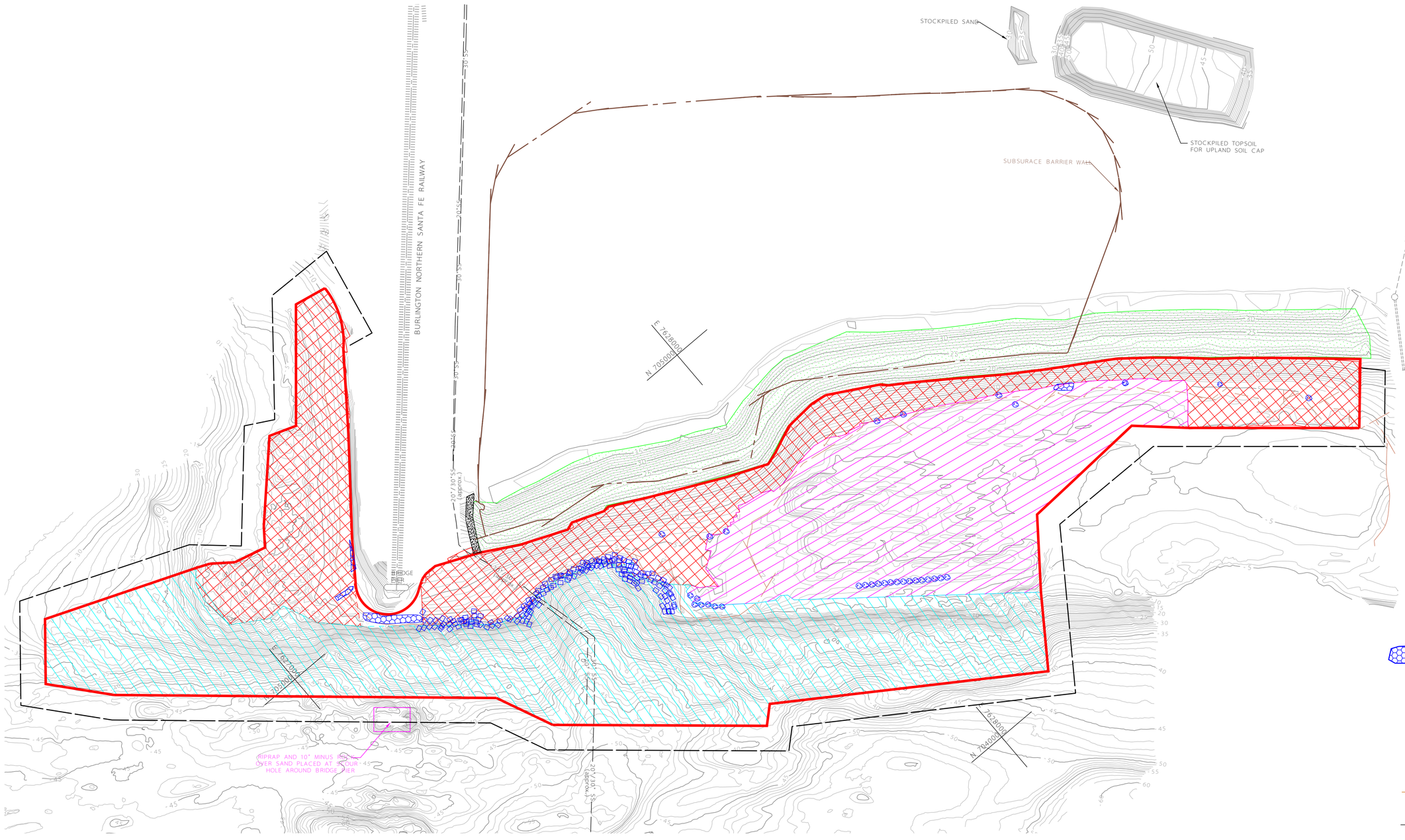

LEGEND:

- DSL EASEMENT (#31530-EA)
- SAND CAP BOUNDARY
- ARTICULATED CONCRETE BLOCK
- 6-INCH MINUS ROCK ARMOR
- 10-INCH MINUS ROCK ARMOR
- RIPRAP ARMOR (ELEVATIONS NOT SURVEYED)
- RIPRAP ARMOR
- BOULDER CLUSTERS AND ROCK MOUND
- TURF REINFORCEMENT MAT
- GRAVEL ROAD
- SURVEY DATUM BOUNDARY (CRD/NGVD)
- SS — HIGH PRESSURE SEWER LINE
- STM — STORM SEWER

NOTES

1. FEATURES LANDWARD OF TOP OF BANK DO NOT REFLECT CONSTRUCTION PERFORMED IN 2005.
2. BATHYMETRY SHOWN ON THIS DRAWING SHOULD NOT BE USED FOR NAVIGATIONAL PURPOSES.
3. FOR OTHER NOTES, SEE SHEET 5.

SCALE IN FEET: 0 100 200 300

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
REVISIONS
APPROVED BY: A. WHITMAN

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS

ARMOR FEATURES AS OF NOVEMBER 2005

McCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.	DRAWING NO.
NOTED	5-2-06	Record Drawing.dwg	2 of 5

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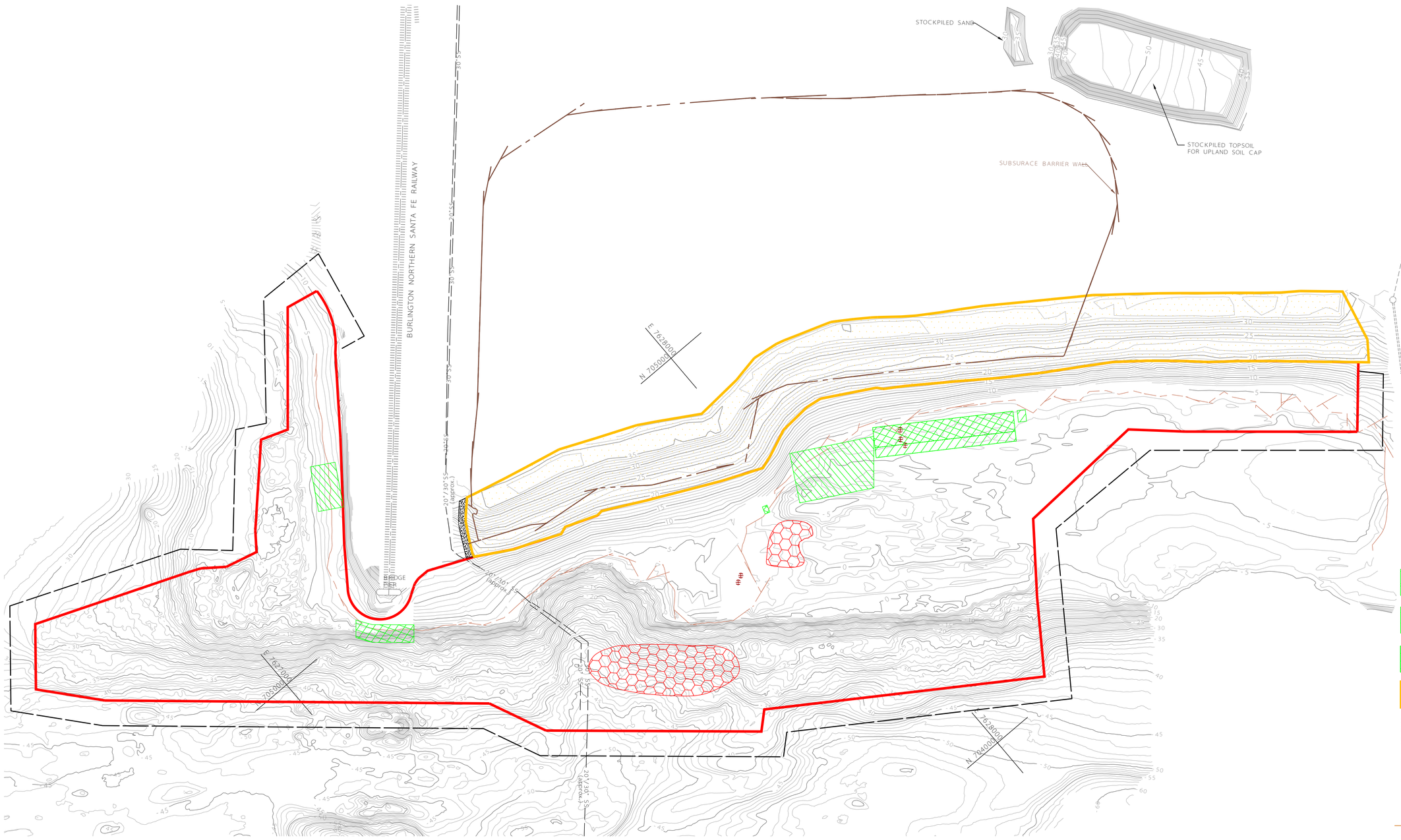

LEGEND:

- DSL EASEMENT (#31530-EA)
- SAND CAP BOUNDARY
- ORGANOCLAY MAT (DOUBLE LAYER)
- ORGANOCLAY MAT (SINGLE LAYER)
- GRANULAR ORGANOCLAY
- SOIL CAP (IMPORTED TOPSOIL)
- GRAVEL ROAD
- HOT SPOT TREATMENT (THICKENED SAND LAYER)
- "BLISTER" REPAIR
- SURVEY DATUM BOUNDARY (CRD/NGVD)
- SS — HIGH PRESSURE SEWER LINE
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ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
REVISIONS
APPROVED BY: A. WHITMAN

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS

SUBARMOR FEATURES AS OF NOVEMBER 2005

McCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.	DRAWING NO.
NOTED	5-2-06	Record Drawing.dwg	3 of 5

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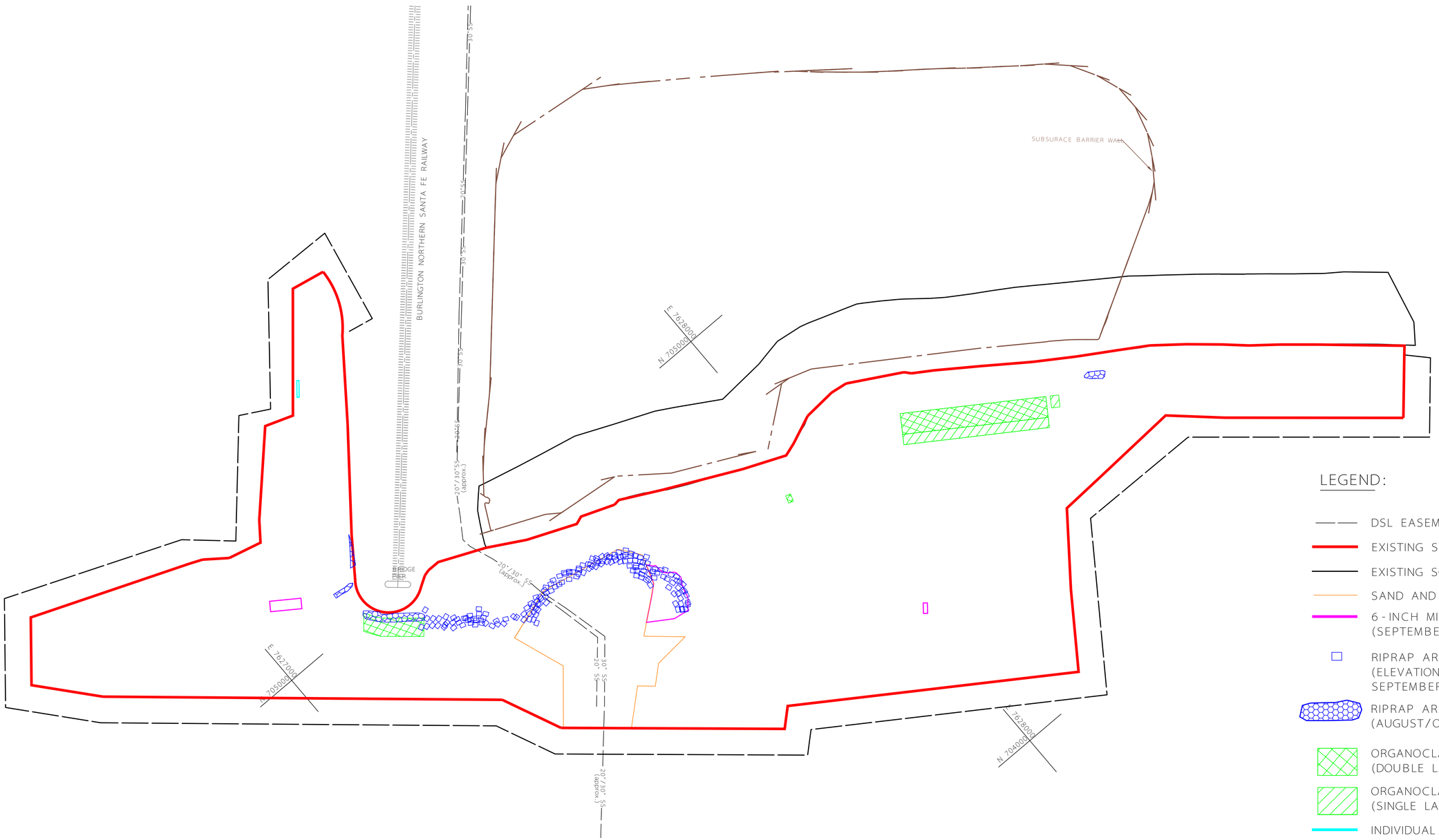

LEGEND:

- DSL EASEMENT (#31530-EA)
- EXISTING SAND CAP BOUNDARY
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- SAND AND ARMOR (AUGUST 2005)
- 6-INCH MINUS ROCK ARMOR (SEPTEMBER 2005)
- RIPRAP ARMOR (ELEVATIONS NOT SURVEYED; SEPTEMBER 2005)
- RIPRAP ARMOR (AUGUST/OCTOBER 2005)
- ORGANOCLAY MAT (DOUBLE LAYER; AUGUST/OCTOBER 2005)
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- — SS — HIGH PRESSURE SEWER LINE
- – – STM – – STORM SEWER

NOTES

FOR NOTES, SEE SHEET 5.

SCALE IN FEET: 0 100 200 300

ecology and environment, inc.
International Specialists in the Environment
Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
REVISIONS
APPROVED BY A. WHITMAN

SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS

CONSTRUCTION
AUGUST 2005 THROUGH OCTOBER 2005

McCORMICK & BAXTER
CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.	DRAWING NO.
NOTED	5-2-06	Record Drawing.dwg	4 of 5

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GENERAL:

1. The work reflected on these Drawings was completed by the following construction contractors:
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REVISIONS	ecology and environment, inc. International Specialists in the Environment Portland, Oregon		SEDIMENT CAP CONSTRUCTION RECORD DRAWINGS
	DESIGNED BY:		GENERAL NOTES
	CHECKED BY:		McCORMICK & BAXTER CREOSOTING CO. PORTLAND, OREGON
	DRAWN BY: S. STEVENS	APPROVED BY A. WHITMAN	SCALE NOTED / DATE ISSUED 5-2-06 / C.A.D. FILE NO. Record Drawing.dwg / DRAWING NO. 5 of 5

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Sediment Cap Inspections and Repairs Report

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Sediment Cap Inspections and Repairs December 2004 through October 2005 McCormick & Baxter Creosoting Company Site Portland, Oregon

Task Order No. 71-03-21

May 2006

Prepared for:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
Northwest Region
2020 SW Fourth Avenue
Portland, Oregon 97201-4987

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1 Side-Scan Sonar Image with Investigation Areas Identified

2 6-Inch Minus Rock Placement

List of Abbreviations and Acronyms

Acronym	Definition
AAC	Advanced American Construction, Inc.
AAD	Advanced American Diving Service, Inc.
BNSF	Burlington Northern Santa Fe
DEA	David Evans & Associates, Inc.
DEQ	Oregon Department of Environmental Quality
E & E	Ecology and Environment, Inc.
GPS	Global Positioning System
McCormick & Baxter	McCormick & Baxter Creosoting Company
NAPL	Non-Aqueous Phase Liquid
PVC	Polyvinyl chloride
QA	Quality Assurance
TFA	Tank Farm Area

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1 Introduction

Ecology and Environment, Inc. (E & E) under contract with the Oregon Department of Environmental Quality (DEQ), prepared this Sediment Cap Inspections and Repairs Report for the McCormick & Baxter Creosoting Company (McCormick & Baxter), Portland Plant, site located in Portland, Oregon. The site, a former wood-treating facility, is located along the Willamette River at 6900 North Edgewater Street. This report was prepared under Task Order 71-03-21 to document various sediment cap inspections and the resulting corrective actions taken.

The majority of the sediment cap was constructed between June 2004 and September 2004 by Remtech, Inc. Because a City of Portland high-pressure sewerline was discovered protruding above the river bottom within the sediment cap boundary, a second sediment cap contract (Sediment Cap Completion Contract) was awarded to Advanced American Construction, Inc. (AAC) for implementation in the summer and fall of 2005, after the City of Portland had constructed repairs to the sewerline.

This report describes the weekly visual beach inspections of the sediment cap performed between December 2004 and September 2005, the side-scan sonar survey of the sediment cap completed in April 2005, and the diver inspections of the sediment cap conducted between August 19, 2005 and August 25, 2005. In addition, this report describes repairs that were made to the sediment cap based on the findings of the inspections. Weekly visual beach inspections were conducted in order to identify any remaining NAPL sheen or seep locations and any locations where the sediment cap armoring may be inadequate to withstand erosive forces. DEQ contracted David Evans and Associates, Inc. (DEA) to perform a side-scan sonar survey (DEA 2005) on the Willamette River bottom within the sediment cap boundary and to help E & E identify potential anomalies within the sediment cap. The diver inspections were conducted in order to investigate the anomalies and to help complete the Sediment Cap Construction Record Drawings, which are included as Appendix B of the Sediment Cap Completion Construction Summary Report (E & E 2006b).

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2 Sediment Cap Inspections

2.1 Beach Inspections

2.1.1 NAPL Sheen Releases

Upon completion of construction activities in November 2004, E&E began weekly inspections of the capped shoreline and near-shore areas. During these inspections NAPL sheens were observed in three capped areas along the shoreline: west of the tank farm area (TFA) seep that had previously been capped with granular organoclay, immediately east of the organoclay capped TFA seep, and beneath the Burlington Northern Santa Fe (BNSF) railroad bridge. NAPL releases from these areas appeared to correlate with low tides, during which gas ebullition is most prevalent. It is hypothesized that gas ebullition results from a two step process where the first step involves the generation of dissolved gasses by microbiological activity within underlying sediments and the second step involves the transition of gasses from the dissolved state to the gaseous state as the water pressure decreases at low tide. See Subsection 3.1 for information regarding corrective actions taken by DEQ to address these NAPL sheen release areas.

2.1.2 Erosion

Erosion of the sediment cap armoring was observed at certain areas during the weekly visual beach inspections that were performed by DEQ and E & E between December 2004 and September 2005. Erosion was observed in three areas: along the upper edge of the ACB/6-inch minus rock interface in Willamette Cove, along the ACB/6-inch minus rock interface just upstream of the BNSF railroad bridge, and along the ACB/10-inch minus rock interface upstream of the TFA seep. See Section 3.2 for information regarding corrective actions taken by DEQ to remedy the erosion areas.

2.2 Side-Scan Sonar

2.2.1 Contracting and Subcontracting

DEA, subcontracted by E & E, conducted a side-scan sonar survey of the entire sediment cap area in April 2005.

2.2.2 Scope of Work

The side-scan sonar survey was conducted in order to help document, to the extent possible, the sediment cap and its components, and also to detect debris or bathymetric features within the sediment cap boundary that may affect the integrity of the cap.

DEA used an Edgetech 4200 FS dual frequency sonar system to conduct the survey. The system's transducer is housed in a towfish, which is towed through the water by boat a few feet above the river bottom. Reflected acoustic returns are processed into an image similar to a negative of a black and white photograph taken from an oblique angle. Typically the side-scan sonar searches a 60 to 100 feet wide swath, at about 2 miles per hour. A differential global positioning system (GPS) corrected for sonar layback was used to guide the boat along predetermined search lines, in addition to supplying GPS location information to the side-scan sonar image, allowing DEQ to return to particular locations for further investigation.

Upon review of the side-scan sonar image, DEQ and E & E selected specific investigation areas to be further inspected by divers (see Subsection 2.3). The side-scan sonar image with investigation areas identified can be seen in Figure 1.

2.3 Diver Inspections

2.3.1 Contracting and Subcontracting

Diver inspections were conducted by Advanced American Diving Service, Inc. (AAD), doing business as Advanced American Construction, Inc. (AAC), contracted by DEQ under Change Order No. 1 to the Sediment Cap Completion Contract. A 3-man dive crew, including a boat and dive equipment was utilized under the contract.

AAC subcontracted DEA to supply a field hydrographer equipped with Hypack® software and GPS in order to provide location data during the diver inspections.

A DEQ representative was onboard occasionally to observe the work and to provide direction as needed. Under contract to DEQ, an E & E representative was onboard throughout the diver inspection to give specific locations and provide direction pertaining to inspection objectives.

2.3.2 Scope of Work

Diver inspections were conducted in order to investigate potential anomaly areas highlighted in DEA's side-scan sonar image and to fill in as-built data gaps for the Sediment Cap Construction Record Drawings. Under Sediment Cap Completion Change Order No. 1, AAC also performed tasks to neaten the sediment cap (i.e., trimmed geotextile fabric sticking up from underneath the ACB in Willamette Cove, placed individual whole or half ACB blocks into gaps found along the shoreline in Willamette Cove, cut stainless steel and plastic loops

found sticking up from the ACB within Willamette Cove and removed stakes or polyvinyl chloride (PVC) markers used during 2004 sediment cap construction) and collected sand cores under the direction of an E & E representative to verify adequate sand placement during sediment cap completion.

The scope of work under Change Order No. 1 is summarized as follows:

A. Obtain cores in sand in Sediment Cap Completion Area
B. Map cap edge
C. Determine the condition of the ACB and 6-inch minus interface
D. Investigate the no-armor area (an area where records indicated that no armor had been placed)
E. Check selected submerged logs and their impact upon the sediment cap
F. Investigate the shoal downstream from the railroad bridge
G. Check "armor slough"
H. Check erosion near the railroad
I. Locate, mark if necessary, and cut plastic and stainless steel loops on the ACB

As mentioned in Subsection 2.2.2, prior to commencement of the diver inspections, E & E and DEQ reviewed a hard copy of DEA's side-scan sonar image and selected specific investigation areas to be inspected by AAC. Change Order Items E, G and H were broken down and identified according to the specific investigation areas selected for easier communication pertaining to specific investigation locations in the field. These investigation areas were identified as Items E1, E2, E3, E4, G1, G2, G3, H1 and H2, and can be seen in the Side-Scan Sonar Image with Investigation Areas Identified (Figure 1).

2.3.3 Results

AAC conducted the diver inspections between August 19, 2005 and August 25, 2005. This subsection describes the results of the inspections, and any deficiencies that were discovered, in reference to the items identified in Sediment Cap Completion Change Order No. 1 and the investigation areas identified on the side-scan sonar image shown in Figure 1. Items A and I of the change order are described in the Sediment Cap Completion Construction Summary Report (E & E 2006b), as they are not related to the objectives of this report. Section 3 describes corrective actions taken by DEQ to address sediment cap deficiencies.

Item B: Map Cap Edge

Under this particular item of the change order, DEQ required coordinates for the sediment cap boundary (armoring extents), where either Hypack® data points were not provided by the sediment cap construction contractor, Remtech Inc., or DEA's November 2004 survey was incomplete. Specifically, the divers were required to map the extent of the ACB in Willamette Cove and the extent of the 10-inch minus rock in the embayment.

ACB Edge in Willamette Cove:

AAC divers located the ACB edge and walked along the interface of the ACB and 6-inch minus rock, probing the rock with a 6-foot metal rod, to be sure they were on the edge. AAC marked the edge with 17 buoys, approximately 100 feet apart. DEA's hydrographer took GPS coordinates for each buoy and identified them as ACB-Edge Reference Buoy 1 through ACB-Edge Reference Buoy 17. E & E's representative took notes in reference to each buoy; some buoys were tied off on the 6-inch rock minus berm in areas where 6-inch minus rock was too thick along the ACB edge, estimating the ACB edge as accurately as possible. The ACB edge in Willamette Cove was interpolated from the 17 buoys for the Sediment Cap Construction Record Drawings.

10-Inch Minus Edge in the Embayment:
As in the mapping of the ACB edge in Willamette Cove, AAC divers walked the edge of the 10-inch minus rock in the embayment, and placed five buoys approximately every 100 feet. DEA's hydrographer took GPS coordinates for each buoy and identified them as 10-Edge Reference Buoy 1 through 10-Edge Reference Buoy 5. The 10-inch minus rock edge in the embayment was interpolated from the five buoys for the Sediment Cap Construction Record Drawings.

Deficiency Discovered:
While AAC divers were mapping the ACB edge in Willamette Cove, they discovered an approximate 4-foot wide gap between ACB mats. AAC marked the gap with a buoy, recorded by DEA's hydrographer as Reference Buoy 3. A portion of this gap was delineated by underwater inspections and the remainder delineated by probing with a 15-foot pole from AAC's skiff. E & E estimated the gap to be approximately four ACB mat widths long (approximately 32 feet). The corrective action taken by DEQ to remedy this area is described in Section 3.3.

Item C: Determine the Condition of the ACB and 6-Inch Minus Rock Interface
Post 2004 sediment cap construction, there was concern about the possibility of erosion occurring along the ACB/6-inch minus rock interface located downstream of the BNSF railroad bridge. There was also concern that the 6-inch minus rock berm did not overlap up onto the ACB edge along the entire length of the interface. Item C is identified on the Side-Scan Sonar Image with Investigation Areas Identified (Figure 1). Through AAC's diver inspections, the ACB and 6-inch minus rock interface located downstream of the BNSF railroad bridge was determined to be in good condition. AAC divers walked the interface at a depth of 12 feet (at -7 CRD; the water level was at approximately +5 CRD at that time) and probed the rock with a six-foot metal rod. The rock felt and appeared to be competent.

Deficiency Discovered:

AAC marked an approximate 20 ft x 60 ft area with a buoy, recorded by DEA's hydrographer as Reference Buoy 1, in "ACB Area 2" where armoring was found to be very thin along the ACB edge. Within that area, an approximate 10 ft x 10 ft area was found where there was no armoring adjacent to an ACB mat. The area extended 60 feet along the ACB edge (40 feet upriver and 20 feet downriver from Reference Buoy 1) and was 20 feet wide (10 feet shoreward and 10 feet riverward from Reference Buoy 1). The corrective action taken by DEQ to remedy this area is described in Section 3.4.

Item D: Investigate the No-Armor Area

In reviewing the 6-inch minus rock placement Hypack® data points from 2004 sediment cap construction, an area upstream of the sediment cap completion area appeared to be missing 6-inch minus rock; however, it seemed more likely that the data points were simply missing for the area. In order to verify 6-inch minus rock coverage across the area, DEA's hydrographer located the apparent "no-armor" area, and AAC probed the area with a six-foot metal rod in passes back and forth across the area. AAC found that 6-inch minus rock coverage was adequate, suggesting that E & E and DEQ are simply missing Hypack® data for the area. scan sonar results. The "no-armor" area can be seen as verified for 6-inch minus rock coverage in Figure 2: 6-Inch Minus Rock Placement.

Item E: Investigate Select Submerged Logs and Their Impact upon the Sediment

DEA's side-scan sonar image highlighted potential anomaly areas within the sediment cap boundary, many of which appeared to be submerged logs embedded within the sediment cap. DEA's hydrographer guided AAC divers to the investigation areas to provide visual verification of the side-scan sonar results, and to determine the effect the debris may be having on the integrity of the cap. Sediment Cap Completion Change Order No. 1 Item E was broken down into four different investigation areas identified as Items E1, E2, E3, and E4, which can be seen in the Side-Scan Sonar Image with Investigation Areas Identified (Figure 1).

Item E1:

AAC divers found five logs. Three logs were partially submerged with capping material and were embedded in the sediment cap. Two of the logs had apparently drifted into the area after sediment cap construction. Armoring appeared to be competent despite the position of the logs.

Item E2:

The squiggly lines shown in the side-scan sonar image appeared to be drag lines through the 6-inch minus rock from an anchor or spud. The depressions were approximately 10 inches deep at the deepest point, and they were approximately three feet wide. The diver probed along the inside of the depressions and found one area where the rock was only 4-6 inches thick, however most of the armoring felt competent within the depressions.

Item E3:
AAC divers found an approximate 14-foot tall, 16-inch diameter tree. AAC also found two approximate 16-inch diameter pilings; one was sticking approximately 20 feet up from the river bottom and the other was sticking approximately 24 feet up from the river bottom.

Item E4:
AAC divers found an approximate 6-foot diameter root wad and an approximate 20-foot long, 10-inch diameter log. The root wad had armoring on top of it as well as all around it, indicating that the sediment cap was constructed after it had deposited there. However, the log appeared to have drifted in after sediment cap installation.

Item F: Investigate the Shoal Downstream From the Railroad Bridge
See Item G1.

Item G: Check "Armor Slough"
DEA's side-scan sonar image revealed pale areas where armoring appeared to have sloughed off. DEA's hydrographer guided AAC divers to the investigation areas to provide visual verification of the side-scan sonar results. Sediment Cap Completion Change Order No. 1 Item G was broken down into three different investigation areas identified as Items G1, G2 and G3, which can be seen in the Side-Scan Sonar Image with Investigation Areas Identified (Figure 1).

Item G1:
Item G1 was determined by AAC divers and E & E's representative to be the same area referred to in Item F, and is recorded as Item Gl on the Side-Scan Sonar Image with Investigation Areas Identified (Figure 1). AAC found that there was approximately five feet of sand on top of armoring in the highest part of the shoal.

Item G2:
AAC divers determined Item G2 to be sand that deposited on top of the armoring, and it was found to be approximately one foot thick at its highest point.

Item G3:
AAC divers reported that Item G3 appeared to be silt deposited on top of the armoring, filling the ACB voids. The silt was found to be approximately 1.5 feet thick at its highest point. AAD found an approximate 6-foot diameter area within the Item G3 investigation area, where armoring was only approximately two inches thick, but armoring was solid all around the thin area.

Item H: Check Erosion Near the Railroad
Post 2004 sediment cap construction, there was concern about the possibility of armoring erosion occurring along the shallow/deep transition just upstream and downstream of the BNSF railroad bridge. Sediment Cap Completion Change Order No. 1 Item H was broken down into two different investigation areas

identified as Items H1 and H2, in order to differentiate the portions on either side of the sediment cap completion area; Items H1 and H2 can be seen in the Side-Scan Sonar Image with Investigation Areas Identified (Figure 1).

Item H1:
AAC walked the transition and probed the armoring with a metal rod. The armoring felt and appeared to be competent for most of the length; however a couple of thin spots were noted. AAC found five pilings that were approximately four feet apart and determined that the armoring was solid around them. There was no evidence of scouring.

Item H2:
AAC walked the transition and probed the armoring with a metal rod. The armoring felt and appeared to be competent for most of the length; however a couple thin spots were noted.

Deficiencies Discovered:
1. AAC marked an approximate 8 ft x 20 ft area with a buoy, recorded by DEA's hydrographer as Reference Buoy 2, where armoring was found to be very light (only 2-3 inches thick). The area extended 20 feet toward the shore, 4 feet upriver, and 4 feet downriver from Reference Buoy 2. The area marked with Reference Buoy 2 included an approximate 6 ft x 8 ft area that was without any armoring. The corrective action taken by DEQ to remedy this area is described in Section 3.4. There did not appear to be any evidence of wave action or scour.

2. AAC found a large area directly upstream of the sediment cap completion area, extending northeast from the boulder pile flattened by AAC, up to the ACB (approximately), where they were able to stick the probe six feet through sand without feeling any armoring. Just riverward, a 6 ft x 20 ft area was also found without any armoring. The entire area was estimated to be approximately 6,100 square feet by DEA and E&E using all available evidence. The corrective action taken by DEQ to remedy this area is described in Section 3.4.

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3 Sediment Cap Corrective Actions

Through beach inspections, the side-scan sonar survey, and the diver inspections, several deficiencies were discovered within the sediment cap. This section describes the corrective actions taken by DEQ to address the sediment cap deficiencies, in reference to the method through which they were discovered.

3.1 Organoclay Mat Placement

During weekly visual beach inspections performed by DEQ and E & E, NAPL sheen releases were observed in three areas along the shoreline following the 2004 sediment cap construction: west of the TFA seep that had previously been capped with granular organoclay, immediately east of the organoclay capped TFA seep, and beneath the Burlington Northern Santa Fe (BNSF) railroad bridge (see Subsection 2.1.1). The sheen releases appeared to be associated with the liberation of gas bubbles (gas ebullition), presumably from the biological degradation of organic material.

DEQ elected to use organoclay mats to remedy the three NAPL sheen release areas:

1. The area west of the organoclay capped TFA seep was capped with organoclay mats by Wilder Construction in August 2005. Refer to the Upland Cap Construction Summary Report (E & E 2006a) and the Sediment Cap Completion Construction Summary Report (E & E 2006b) for more detailed information.
2. The area east of the organoclay capped TFA seep was capped with organoclay mats by Wilder Construction under Change Order No. 9 to the Upland Cap Construction Contract with DEQ. Organoclay placement was performed from October 18, 2005 to October 26, 2005 and is described in the Upland Cap Construction Summary Report (E & E 2006a).
3. The area underneath the BNSF railroad bridge was capped with organoclay mats by AAC under Sediment Cap Completion Change Order No. 4. Organoclay placement was performed from October 20, 2005 to October 25, 2005 and is described in the Upland Cap Construction Summary Report (E & E 2006a).

The three organoclay mat placement areas are shown in the Sediment Cap Construction Record Drawings.

3.2 Additional Riprap Placement

Minor erosion of sediment cap armoring was observed during the weekly visual beach inspections performed by DEQ and E & E. Erosion was observed in three areas: along the upper edge of the ACB/6-inch minus rock interface in Willamette Cove, along the ACB/6-inch minus rock interface just upstream of the BNSF railroad bridge, and along the ACB/10-inch minus rock interface upstream of the TFA seep (see Subsection 2.1.2). All three areas resulted from construction deviations of the original design rather than design deficiencies.

DEQ elected to place additional riprap to remedy the three areas where erosion was observed. Wilder Construction placed riprap along the upper edge of the ACB/6-inch minus rock interface in Willamette Cove and along the ACB/10-inch minus rock interface upstream of the TFA seep. AAC placed riprap along the ACB/6-inch minus rock interface just upstream of the BNSF railroad bridge. Upon AAC's completion of the sediment cap, riprap now extends all the way from the rock mound to the ACB edge downstream of the BNSF railroad bridge. See the Sediment Cap Construction Record Drawings for riprap placement locations.

3.3 Individual ACB Block Placement

An estimated 4 ft x 32 ft gap was discovered between ACB mats in the Willamette Cove during AAC's diver inspection (see Subsection 2.3.3, Item B). In order to remedy the area, DEQ directed AAC to place individual ACB blocks leftover from 2004 sediment cap construction in the gap. In September 2005, AAC loaded their skiff with extra whole and half ACB blocks left on the shoreline near the TFA seep area and along the bank in Willamette Cove, and placed the blocks inside the gap as tightly as possible. During ACB block placement, the gap was discovered to be larger than first estimated; AAC placed a total of 90 individual ACB blocks to fill the gap. The filled gap location is shown in the Sediment Cap Construction Record Drawings.

3.4 Additional 6-Inch Minus Rock Placement

Three inadequately-armored areas were discovered during AAC's diver inspections:

1. An approximate 20 ft x 60 ft area along the ACB edge in Willamette Cove (see Subsection 2.3.3, Item C).
2. An approximate 8 ft x 20 ft area riverward of the rock mound (see Subsection 2.3.3, Item H).
3. An approximate 6,100 square-foot area directly upstream of the Sediment Cap Completion Area extending northeast from the boulder pile flattened by AAC, up to the ACB (see Subsection 2.3.3, Item H).

In order to remedy the areas, DEQ directed AAC to place additional 6-inch minus rock over the areas in the same manner it was placed within the Sediment Cap Completion Area. The third area described above was also armored with riprap in

the same manner as in the Sediment Cap Completion Area. Refer to the Sediment Cap Completion Construction Summary Report (E & E 2006b) for more information. See the Sediment Cap Construction Record Drawings for 6-inch minus rock placement locations.

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4 References

David Evans and Associates, Inc. (DEA), April 2005, *Side-Scan Sonar Survey, McCormick and Baxter Site*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

Ecology and Environment, Inc. (E & E), May 2006a, *Upland Cap Construction Summary Report, McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, May 2006b, *Sediment Cap Completion Construction Summary Report, McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

_____, May 2006c, *Sediment Cap Construction Summary Report, McCormick & Baxter Creosoting Company, Portland, Oregon*, prepared for the Oregon Department of Environmental Quality, Portland, Oregon.

FIGURES

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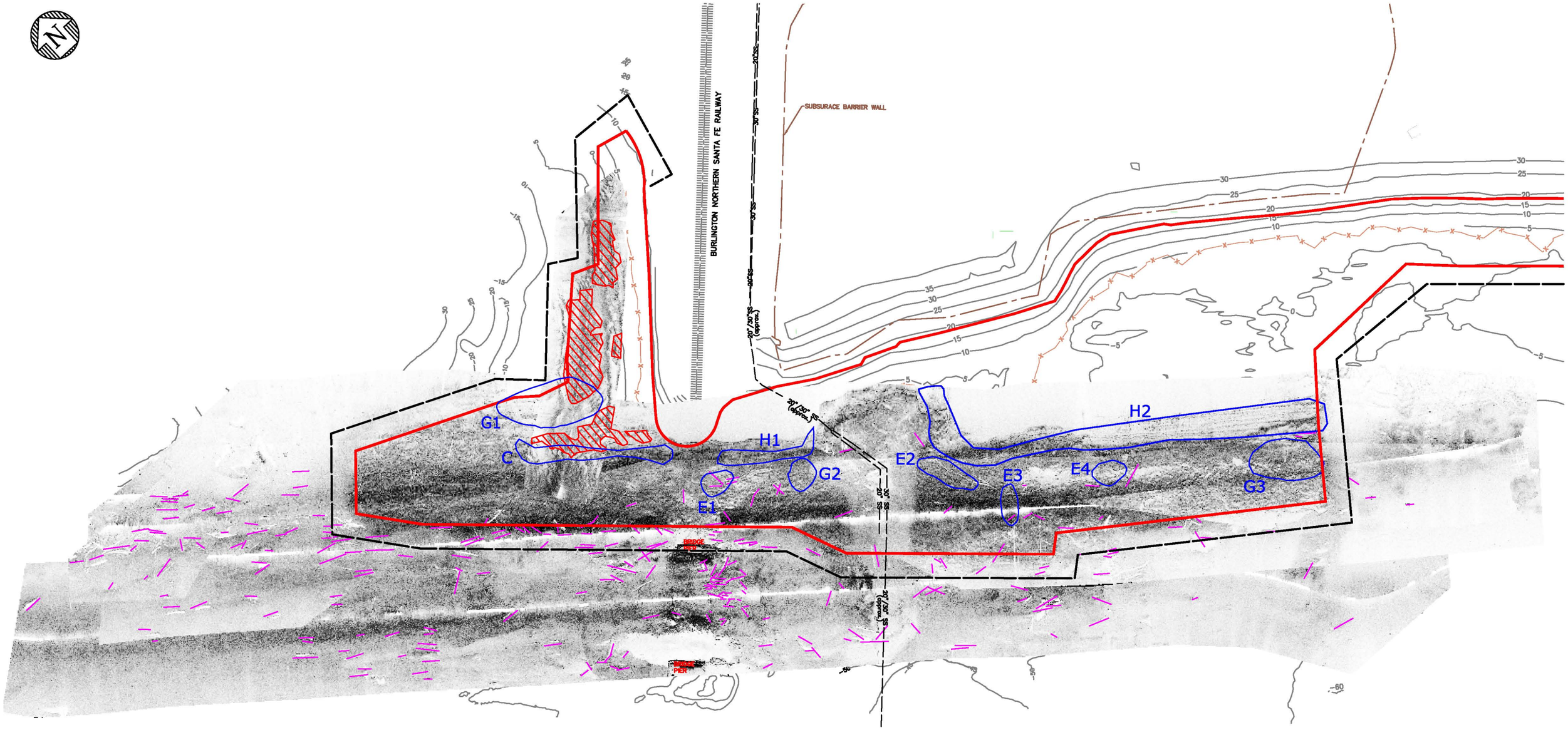

LEGEND:

- ZONE OF EXPOSED ARTICULATED CONCRETE BLOCK (ACB)
- MISCELLANEOUS DEBRIS (PILINGS, LOGS, ETC.)
- INVESTIGATION AREAS
- SAND CAP BOUNDARY
- SURVEY DATUM BOUNDARY (CRD/NGVD)
- DSL EASEMENT (#31530-EA)
- HIGH PRESSURE SEWER LINE

NOTES:
Hydro Survey:

1. This drawing presents the results of a side-scan sonar survey conducted by David Evans and Associates, Inc. (DEA).
2. Date of Survey: April 20, 2005.
3. Horizontal Datum: North American Datum of 1983 - 91 adj. (NAD83/91), State Plane Coordinate System (SPCS), Oregon North Zone.
4. Units: International Feet.
5. All areas of exposed articulated concrete block (ACB) may not be detected with a side-scan sonar.
6. This survey used an Edgetech 4200 FS duel frequency sonar system. Positioning was accomplished with a Differential Global Positioning System (DGPS) and estimated sonar layback.
7. This map is not intended for navigation.

SCALE IN FEET: 0 100 200 300

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International Specialists in the Environment
Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
APPROVED BY

FIGURE 1
SIDE SCAN SONAR IMAGE WITH INVESTIGATION AREAS IDENTIFIED
McCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.
NOTED	5-24-06	Sediment Cap CSR Figs.dwg

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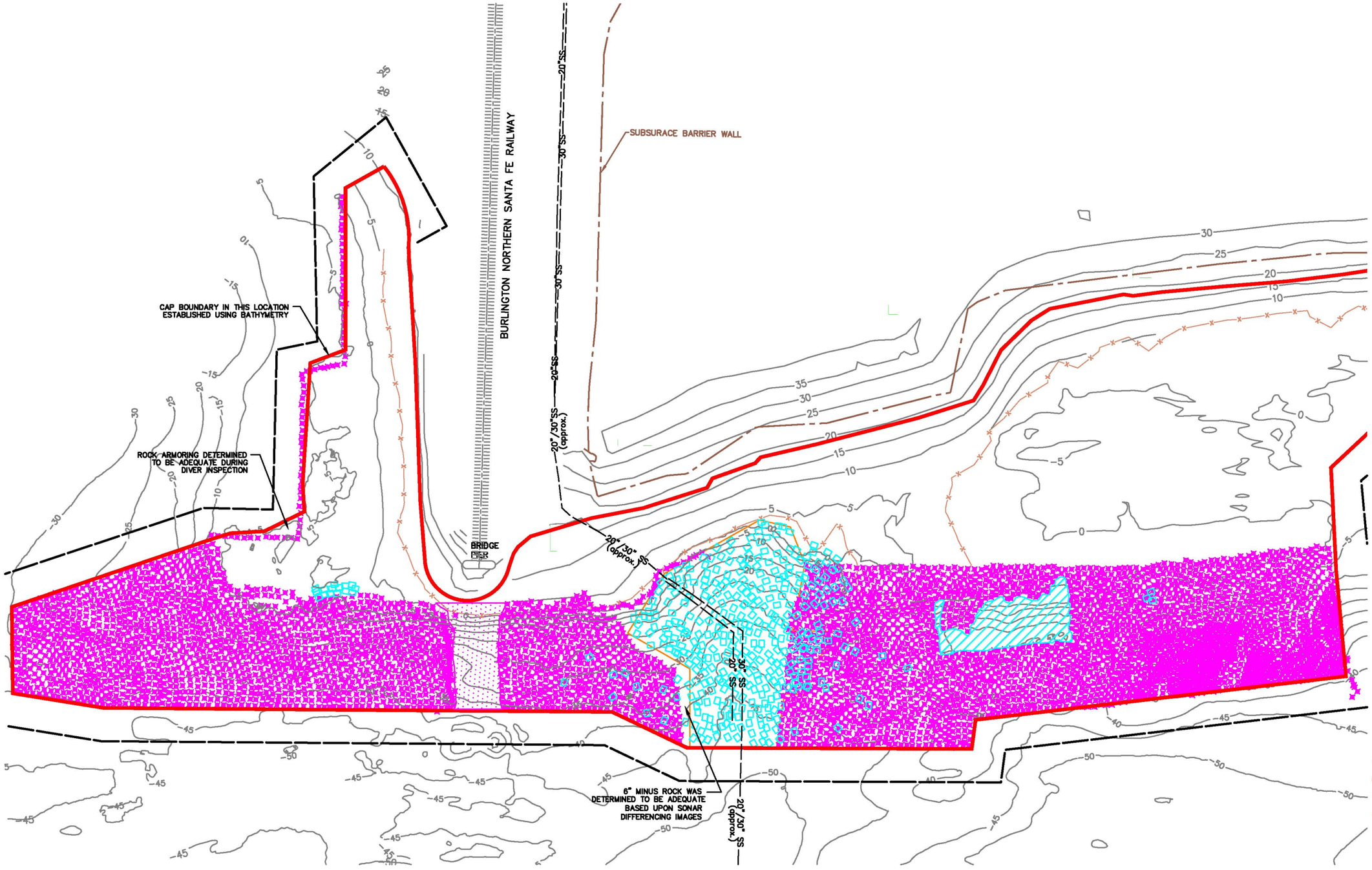

LEGEND:

- 6 INCH MINUS ROCK PLACED BY CRANE BARGE AND CLAMSHELL BUCKET DURING 2004 SEDIMENT CAP CONSTRUCTION
- 6 INCH MINUS ROCK PLACED BY CRANE BARGE AND CLAMSHELL BUCKET DURING 2005 SEDIMENT CAP CONSTRUCTION
- 6 INCH MINUS ROCK PLACED BY LAND BASED EQUIPMENT AND SKIP BOX ON BARGE DURING 2004 SEDIMENT CAP CONSTRUCTION
- DIVE SURVEY 2005: APPROXIMATE AREA INVESTIGATED WITH A STEEL PROBE. ARMORING WAS DETERMINED TO BE ACCURATE; IT APPEARS THAT HYPACK DATA ARE MISSING FOR THE AREA.
- DSL EASEMENT (#31530-EA)
- SAND CAP BOUNDARY
- SAND AND ARMOR (AUGUST 2005)
- SURVEY DATUM BOUNDARY (CRD/NGVD)
- HIGH PRESSURE SEWER LINE

SCALE IN FEET: 0 75 150 225

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Portland, Oregon

DESIGNED BY:
CHECKED BY:
DRAWN BY: S. STEVENS
APPROVED BY

FIGURE 2
6 INCH MINUS ROCK PLACEMENT

McCORMICK & BAXTER CREOSOTING CO.
PORTLAND, OREGON

SCALE	DATE ISSUED	C.A.D. FILE NO.
NOTED	5-24-06	Sediment Cap CSR Figs.dwg

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D

City of Portland Gula Pump Station Pressure Line Rehabilitation Project Record Drawings

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GULA PUMP STATION PRESSURE LINE REHABILITATION PROJECT
PROJECT NO. 7922

LEGEND

- CATCH BASIN
- FIRE HYDRANT
- WATER VALVE
- GAS VALVE
- WATER METER
- MAIL BOX
- SIGN OR POST
- WATER
- SWAMP
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- POWER VAULT
- POWER TRANSFORMER
- POLE ANCHOR
- END OF CULVERT
- AIR VALVE MANHOLE
- DISTILLING MANHOLE
- SAMPLING MANHOLE
- CLEAN OUT
- WATER MANHOLE
- WATER BLOWOFF
- POWER POLE
- LIGHT
- POWER POLE W/ LIGHT
- REGISTRATION TICK TO TOPOG. OVERLAY
- FENCE
- RETAINING WALL
- GUARD RAIL
- EDGE OF PAVEMENT
- CURB
- EDGE OF DRIVEWAY
- CONCRETE PAD
- TREE
- DITCH OR STREAM ; LAKE
- WATER LINE
- GAS LINE
- ELECTRIC UG
- TELEPHONE UG
- PERMANENT PLUG
- RAILROAD
- STRUCTURE
- UNIDENTIFIED UTILITY OR OBJECT
- EXISTING SANITARY SEWER
- EXISTING INTERCEPTOR SEWER
- EXISTNG FORCE MAIN
- EXISTING PUMP STATION
- EXISTING STORM SEWER
- EXISTNG COMBINED SEWER
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED INTERCEPTOR SEWER
- PROPOSED FORCE MAIN
- PROPOSED PUMP STATION
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- SOIL TEST BORING
- SOIL TEST BORING W/ PIEZOMETER
- SOIL TEST PIT
- EXISTNG DIVERSION MANHOLE
- PROPOSED SEDIMENTATION MH AND SUMP
- INSIDE DROP MANHOLE
- OUTSIDE DROP MANHOLE
- PERMANENT PLUG
- BENCH MARK
- SERVICE LINE PIPE (HOUSE BRANCHES)
- SEPTIC TANK
- CESS POOL
- PROPOSED STORM INLET
- CONTROL POINT
- IRON PIPE OR IRON ROD
- PROPERTY LINE
- PERMANENT EASEMENT

GENERAL NOTES

1. THE LOCATIONS OF EXISTING UTILITY LINES SHOWN ON THESE DRAWINGS HAVE BEEN COMPILED FROM THE BEST AVAILABLE SOURCES AND SUPPLEMENTED BY FIELD SURVEY, BUT ARE TO BE USED FOR INFORMATION PURPOSES ONLY AND THE ACCURACY IS NOT GUARANTEED.
2. ON-SITE CONSTRUCTION PRACTICES SHALL CONFORM TO THE OREGON STATE MANDATED EROSION CONTROL REQUIREMENTS FOR THE COLUMBIA RIVER BASIN.
3. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF PORTLAND STANDARD CONSTRUCTION SPECIFICATIONS.
4. ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON CITY OF PORTLAND DATUM-1.375=USC&GS DATUM.
5. PIPELINE LOCATION SURVEY DATA WILL BE PROVIDED TO THE CONTRACTOR BY THE OWNER.
6. PROJECT LOCATION:
   THE PROJECT WORK AREA IS LOCATED IN THE WILLAMETTE RIVER AT APPROXIMATELY RIVER MILE 7, JUST UPSTREAM OF THE BURLINGTON NORTHERN RAILROAD BRIDGE. IT IS SITUATED IN THE SE 1/4 OF SECTION 12, TOWNSHIP 1 NORTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN AND IS LOCATED ADJACENT TO THE FORMER MCCORMICK & BAXTER CREOSOTING COMPANY SITE AT 6900 N. EDGEWATER STREET. THE AREA IN WHICH THE PRESSURE LINES ARE EXPOSED IS FROM APPROXIMATELY 30 – 100 FEET FROM THE NORTHEASTERN SHORELINE, AND IN WATER DEPTHS RANGING FROM APPROXIMATELY 10 – 30 FEET.
7. SITE ACCESS:
   THE SITE IS ONLY ACCESSIBLE FROM THE WILLAMETTE RIVER. THE CLOSEST PUBLIC ACCESS POINT IS THE CATHEDRAL PARK BOAT RAMP BENEATH THE ST. JOHNS BRIDGE. ENCLOSED IN THE PROJECT SPECIFICATIONS, AS SUPPLEMENTAL INFORMATION IS AN APPLICATION PACKAGE FOR A NON-PARK USE PERMIT. THIS INFORMATION IS PROVIDED IN THE EVENT THAT THE CONTRACTOR DOES NOT POSSESS OR HAVE ACCESS TO AN ALTERNATE ACCESS POINT, AND WOULD LIKE TO USE THE CATHEDRAL PARK AREA FOR STAGING.

SHEET INDEX

SHEET	TITLE
G01	COVER SHEET, LEGEND, NOTES AND LOCATION MAP
C01	PROPOSED LIMITS OF ARMOR ROCK
C02	TYPICAL PILE CAP & GRAVEL SECTIONS
C03	TYPICAL SECTION WITH PILE CAPS
S01	TYPICAL PILE BENT – PLAN VIEW
S02	TYPICAL CONNECTION DETAILS

BENCH MARK

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 – 91 ADJ. (NAD83/91), STATE PLANE COORDINATE SYSTEM (SPCS), OREGON NORTH ZONE.

VERTICAL DATUM: CITY OF PORTLAND DATUM (COP).
TO CONVERT COP ELEVATIONS TO NGVD 29/47, SUBTRACT 1.38 FEET.
TO CONVERT COP ELEVATIONS TO NAVD88, ADD 2.12 FEET.

RECORD DRAWINGS

The Record Documents have been prepared based On information provided by others. David Evans and Associates, Inc. has not verified the accuracy and/or completeness of this information and shall not be responsible for any errors or omissions which may be incorporated herein as a result.

NOT TO SCALE

VICINITY MAP

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. THE CENTER BUSINESS NUMBER IS (503) 232-1987. ONE OF THE REQUIREMENTS OF THESE RULES IS THAT EXCAVATORS MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. TO COMPLY WITH THIS REQUIREMENT, CALL 246-6699 (IN THE LOCAL PORTLAND AREA) OR CALL 1-800-332-2344.

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NO.	DATE	DESCRIPTION	APPD.
1	11/29/05	"AS CONSTRUCTED"	JAG

REVISION

XREF(S) USED:
ROTATION ANGLE:
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY CHECKED BY
FINAL MAP DATA
7922G01.dwg, 05/04/05 at 15:14

DESIGNED BY	JAG	DATE APPD.	
DRAWN BY	ERB	PROGRAM MGR	
CHECKED BY		CONST. MGR.	PGG
DESIGN MGR.			

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
APPROVAL

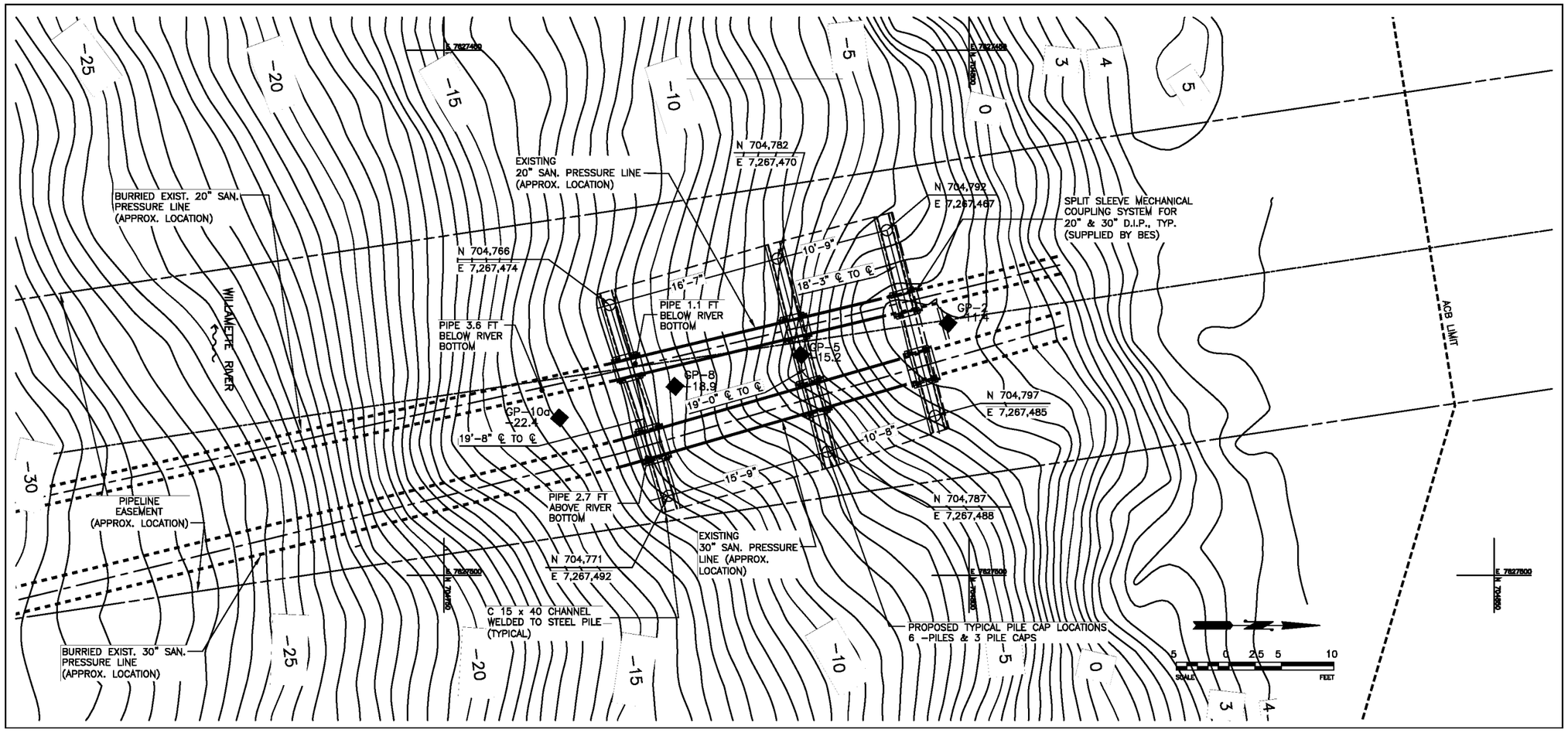
WILLIAM F. RYAN, P.E.
CHIEF ENGINEER

ENVIRONMENTAL SERVICES CHIEF ENGINEER
REG. PROF. ENGR. NO. 16301

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

COVER SHEET
LEGEND, NOTES AND LOCATION MAP

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. G01
1 OF 6



NOTES:

1. THIS DRAWING PRESENTS THE RESULTS OF A MULTIBEAM BATHYMETRIC SURVEY CONDUCTED BY DAVID EVANS AND ASSOCIATES, INC. (DEA).
2. DATE OF SURVEY: NOVEMBER 14, 2005
3. HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 – 91 ADJ. (NAD83/91), STATE PLANE COORDINATE SYSTEM (SPCS), OREGON NORTH ZONE.
4. UNITS: INTERNATIONAL FEET.
5. VERTICAL DATUM: CITY OF PORTLAND (COP). TO CONVERT COP ELEVATIONS TO NGVD 29/47, SUBTRACT 1.38 FEET. TO CONVERT COP ELEVATIONS TO NAVD88, ADD 2.12 FEET.
6. CONTOUR INTERVAL: 1/2 FOOT. CONTOURS WERE DERIVED FROM A DIGITAL TERRAIN MODEL (DTM) BASED ON A 3-FOOT WEIGHTED GRID OF MULTIBEAM DATA.
7. WATER SURFACE ELEVATIONS WERE OBTAINED FROM A REAL-TIME KINEMATIC GLOBAL POSITIONING SYSTEM (RTK GPS).
8. HORIZONTAL POSITIONS WERE ACQUIRED WITH AN APPLANIX POS/MV, COMBINED INERTIAL AND GLOBAL POSITIONING SYSTEM (GPS), AUGMENTED WITH RTK GPS POSITIONS.
9. SOUNDINGS WERE NOT SELECTED BY SHOAL BIAS AND DO NOT REPRESENT LEAST DEPTHS. THIS MAP IS NOT INTENDED FOR NAVIGATION.

LEGEND

-30 — 5 FOOT MAJOR BATHYMETRIC CONTOUR

1 FOOT MINOR BATHYMETRIC CONTOUR

AS-BUILT ARTICULATED CONCRETE BLOCK (ACB) LIMIT

RECORD DRAWINGS

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WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NO.	DATE	REVISION	APPD.
1	11/29/05	"AS CONSTRUCTED"	JAG

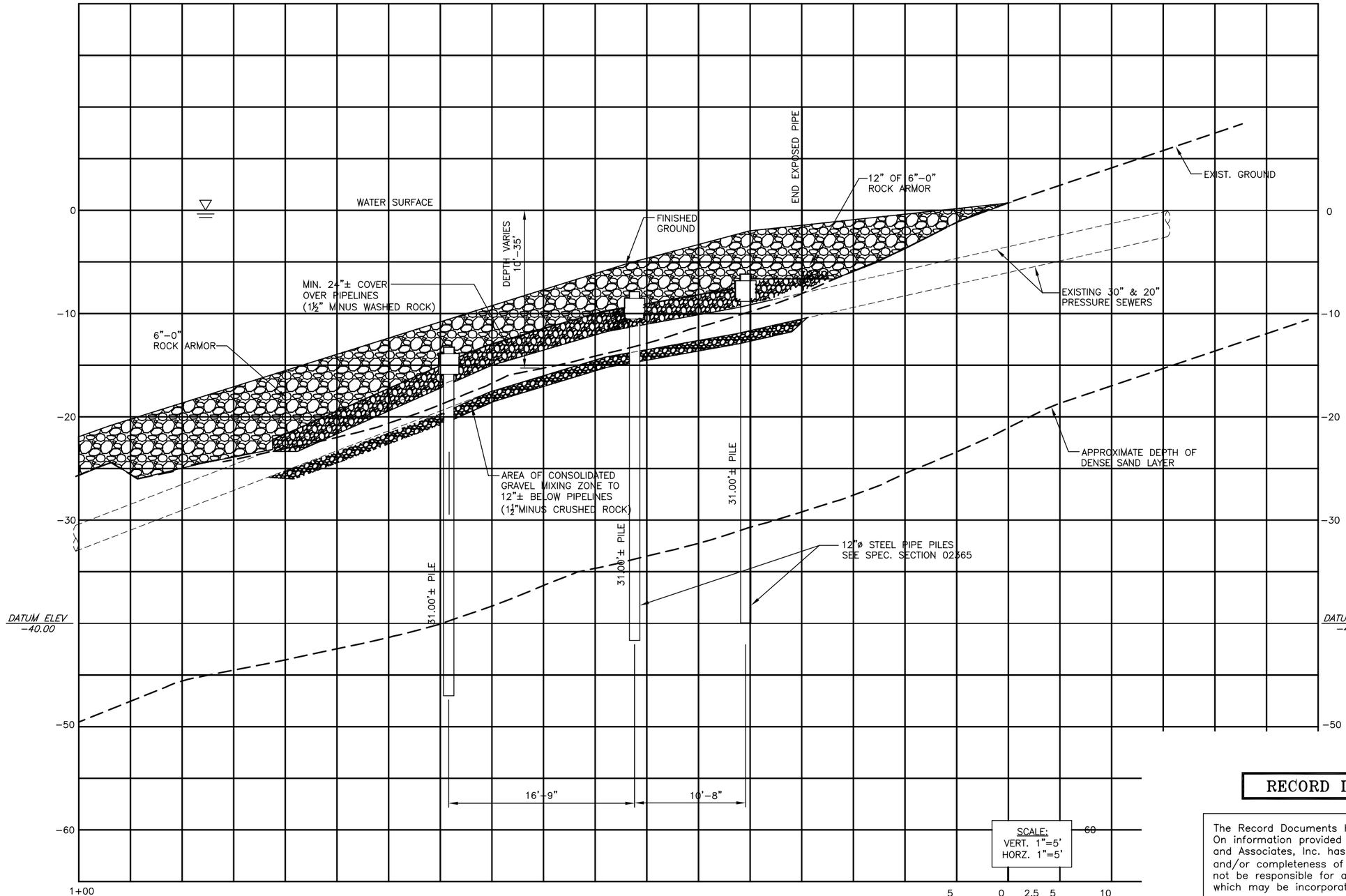
XREF(S) USED:
ROTATION ANGLE:
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY CHECKED BY
FINAL MAP DATA
7922C01.dwg, 05/04/06 at 14:29

DESIGNED BY JAG | DATE APPD.
DRAWN BY EVB | PROGRAM MGR
CHECKED BY | CONST. MGR. PGG
DESIGN MGR.

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION
PROPOSED LIMITS OF ARMOR ROCK

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. C01
2 OF 6



NOTE:
SEE DWG C01 FOR HORIZONTAL LOCATION INFORMATION

TYPICAL SECTION
N.T.S.

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REVISION

XREF(S) USED:
ROTATION ANGLE:
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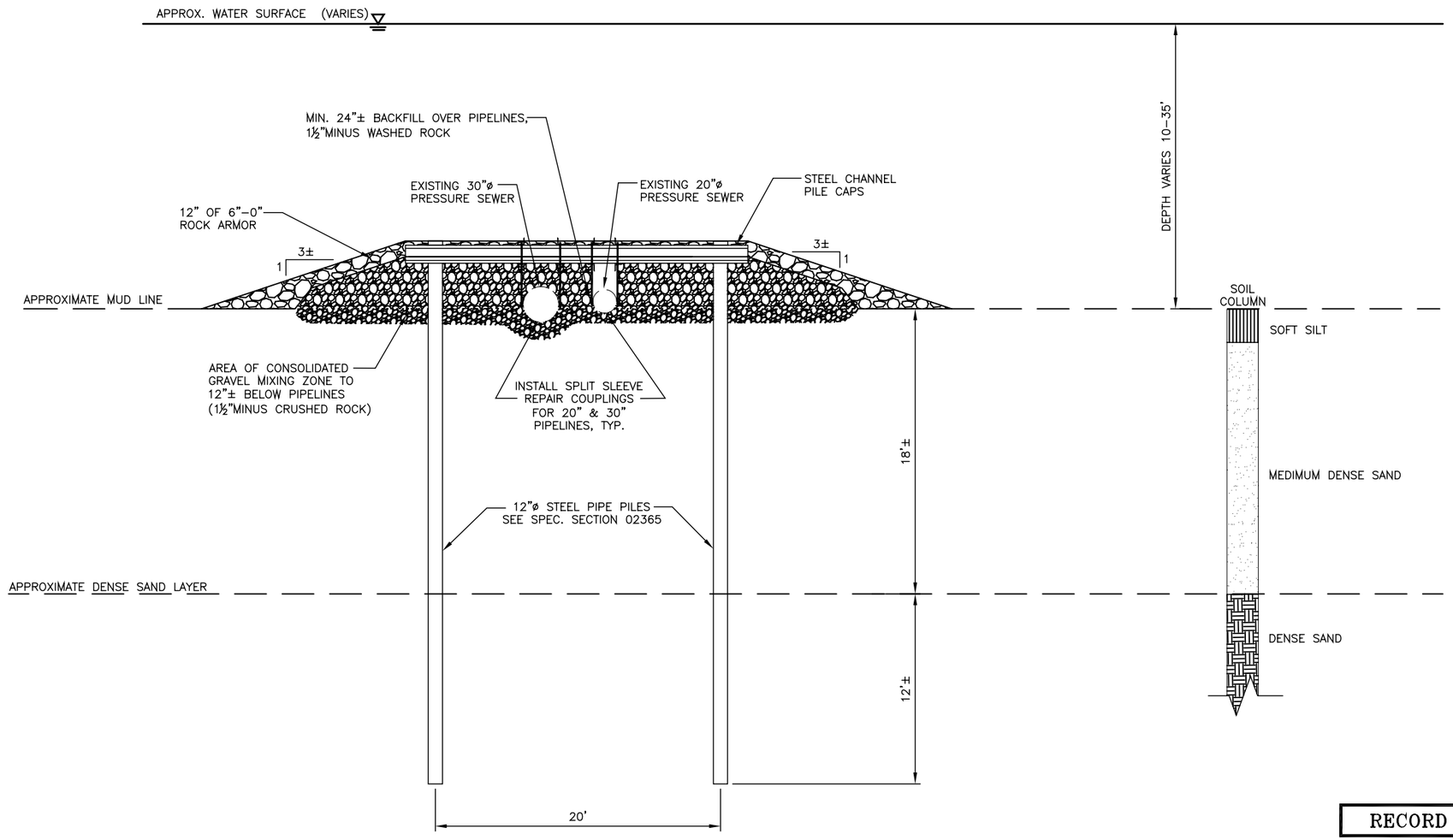
PROJECT COMPLETED
MAP CORRECTED BY CHECKED BY
FINAL MAP DATA
7922C02.dwg, 05/04/05 at 14:35

DESIGNED BY JAG
DRAWN BY JAG
CHECKED BY
DESIGN MGR.
DATE APPD.
PROGRAM MGR
CONST. MGR. PGG

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION
TYPICAL PILE CAP & GRAVEL SECTION

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. C02
3 OF 6



TYPICAL SECTION
N.T.S.

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REVISION

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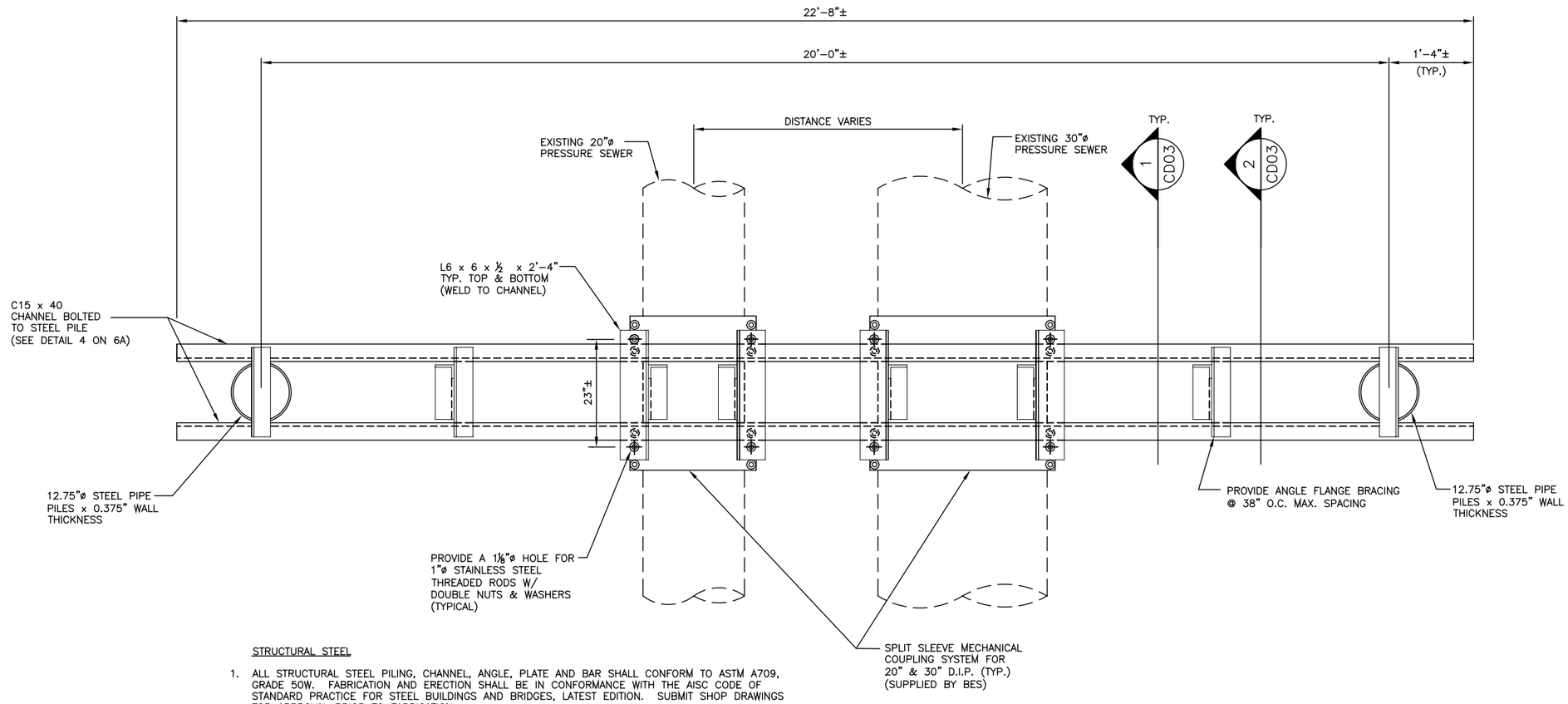
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY CHECKED BY
FINAL MAP DATA
7922C03.DWG, 05/04/05 at 14:39

DESIGNED BY JAG
DRAWN BY JAG/EKB
CHECKED BY
DESIGN MGR.
DATE APPD.
PROGRAM MGR
CONST. MGR. PGG

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION
TYPICAL SECTION WITH PILE CAPS

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. C03
4 OF 6



STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL PILING, CHANNEL, ANGLE, PLATE AND BAR SHALL CONFORM TO ASTM A709, GRADE 50W. FABRICATION AND ERECTION SHALL BE IN CONFORMANCE WITH THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, LATEST EDITION. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
2. NO ATTEMPT HAS BEEN MADE TO DIFFERENTIATE BETWEEN SHOP AND FIELD WELDED CONNECTIONS. ALL WELDING IS TO COMPLY WITH AWS SPECIFICATIONS AND IS TO BE PERFORMED BY CERTIFIED WELDERS.
3. PROVIDE A 3/16" WELD UNLESS A LARGER SIZE OF FILLET WELD IS SPECIFIED ON THE PLANS,
4. BOLTED CONNECTIONS SHALL CONFORM TO ASTM F593, TYPE 316 STAINLESS STEEL.
5. ALL WELDING SHALL BE PREQUALIFIED PER AISC AND AWS D1.5 SPECIFICATIONS (AWS D3.6 WHEN WELDING OCCURS UNDERWATER). ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS BY ELECTRIC ARC PROCESS WITH E70XX ELECTRODES. SHOP WELDS SHALL BE PERFORMED IN THE SHOP OF AN APPROVED FABRICATOR.

TYPICAL PILE BENT – PLAN VIEW

N.T.S.

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FINAL MAP DATA
7922S01.dwg, 05/04/05 at 14:57

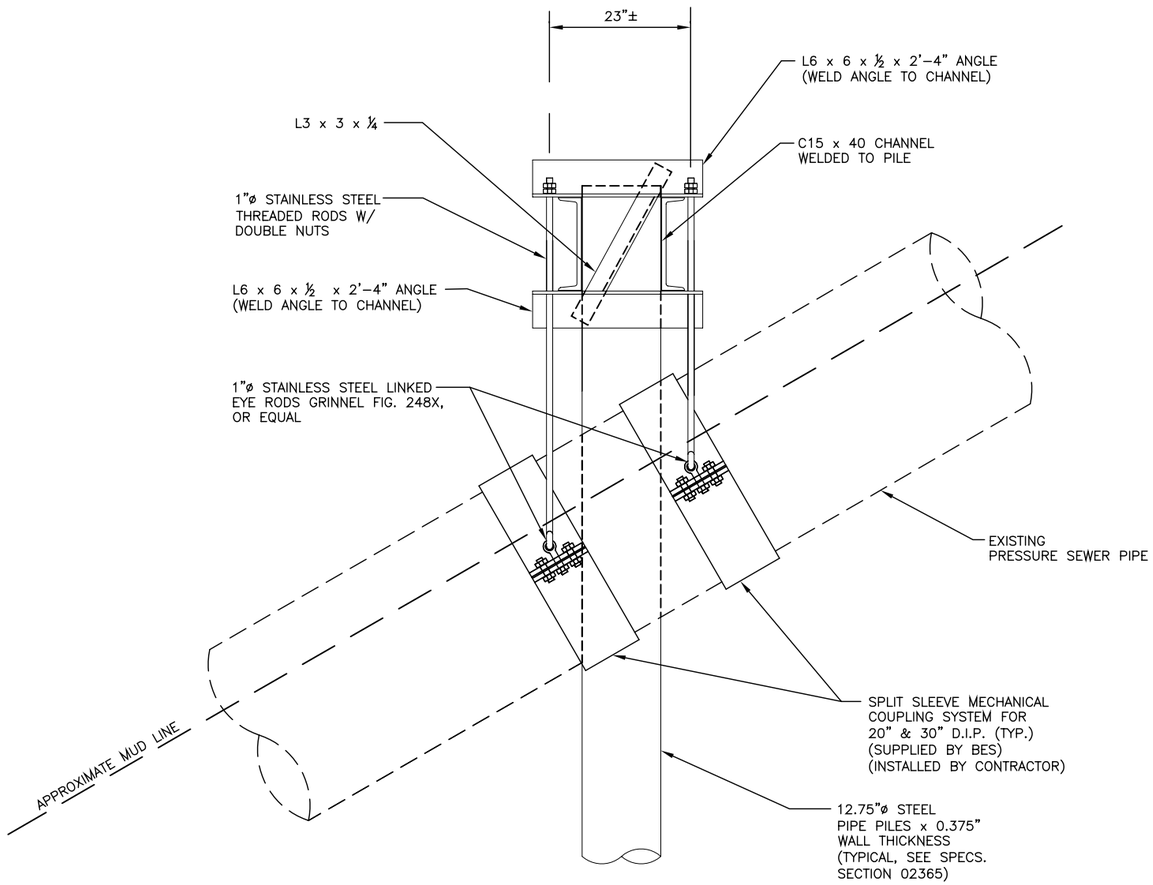
DESIGNED BY JAG
DRAWN BY JAG/EKE
CHECKED BY
DESIGN MGR.
DATE APPD.
PROGRAM MGR
CONST. MGR. PGG

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

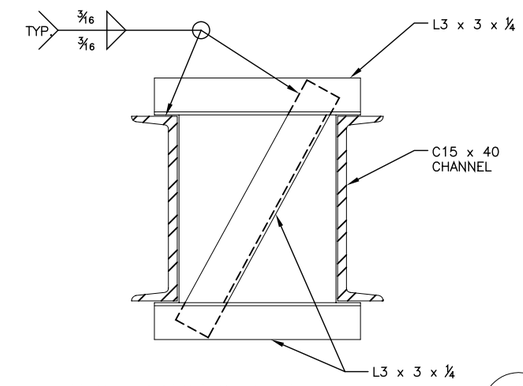
TYPICAL PILE BENT
PLAN VIEW

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. S01
5 OF 6



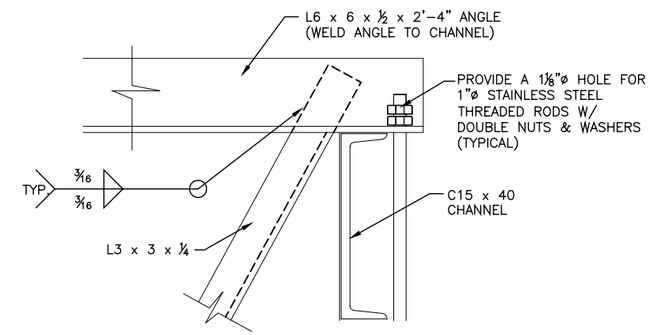
TYPICAL AS–BUILT CONNECTION DETAIL 1/–

N.T.S.



FLANGE BRACING DETAIL 2/–

N.T.S.



CONNECTION DETAIL 3/–

N.T.S.

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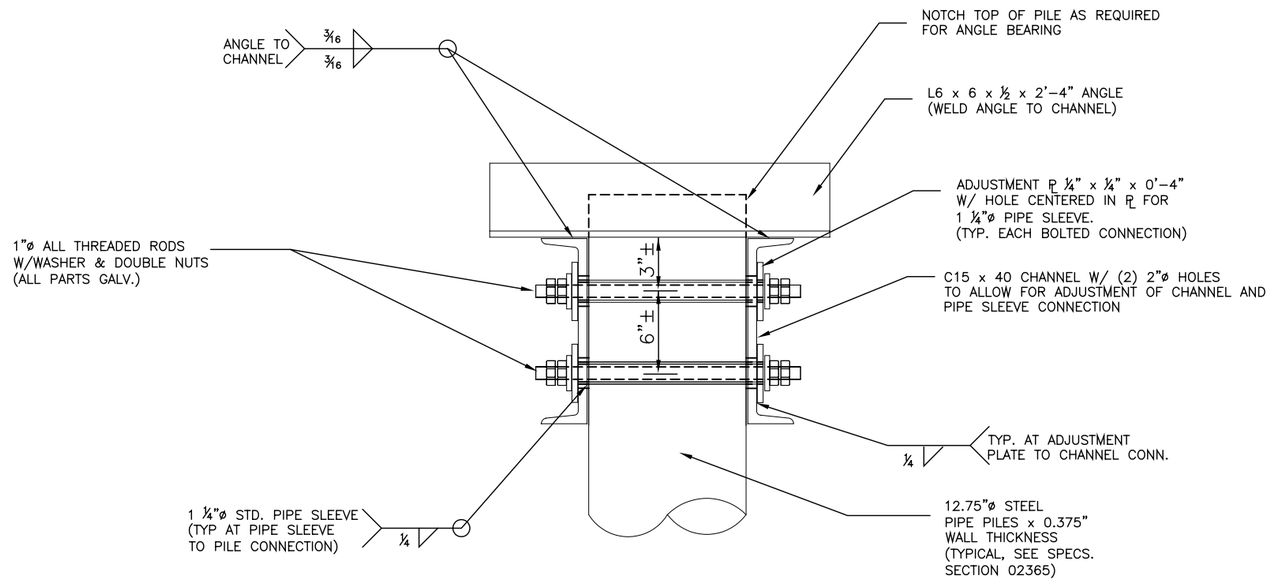
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY CHECKED BY
FINAL MAP DATA
7922S02.dwg, 07/11/05 at 08:29

DESIGNED BY JAG | DATE APPD.
DRAWN BY JAG/EXE | PROGRAM MGR
CHECKED BY | CONST. MGR. PGG
DESIGN MGR.

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION
TYTPICAL CONNECTION DETAILS

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. S02
6 OF 6



TYPICAL AS–BUILT
BOLTED CONNECTION DETAIL

N.T.S.

4
–

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FINAL MAP DATA
7922S02.dwg, 07/11/05 at 08:29

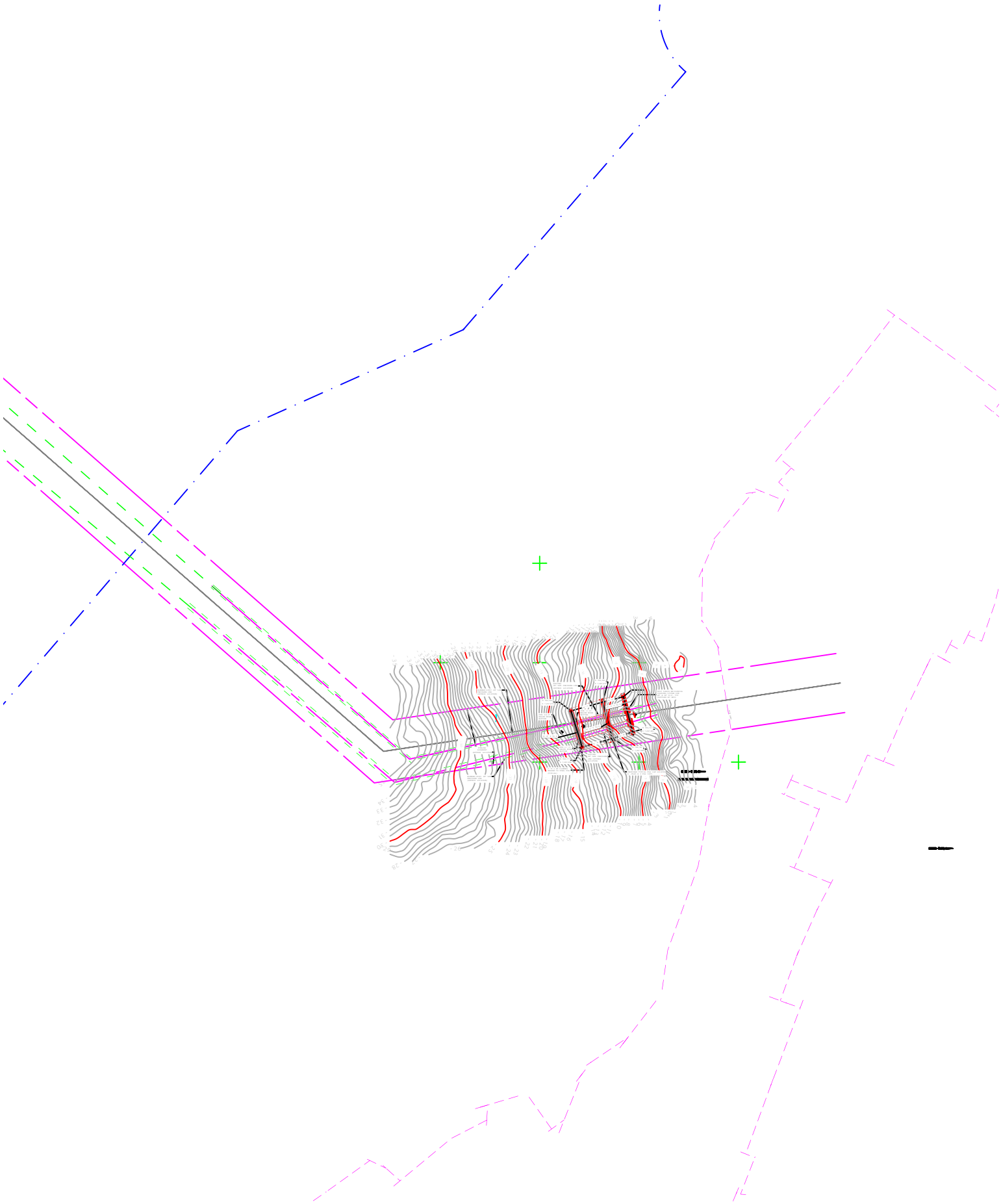
DESIGNED BY	JAG	DATE APPD.	
DRAWN BY	JAG/EXE	PROGRAM MGR	
CHECKED BY		CONST. MGR.	PGG
DESIGN MGR.			

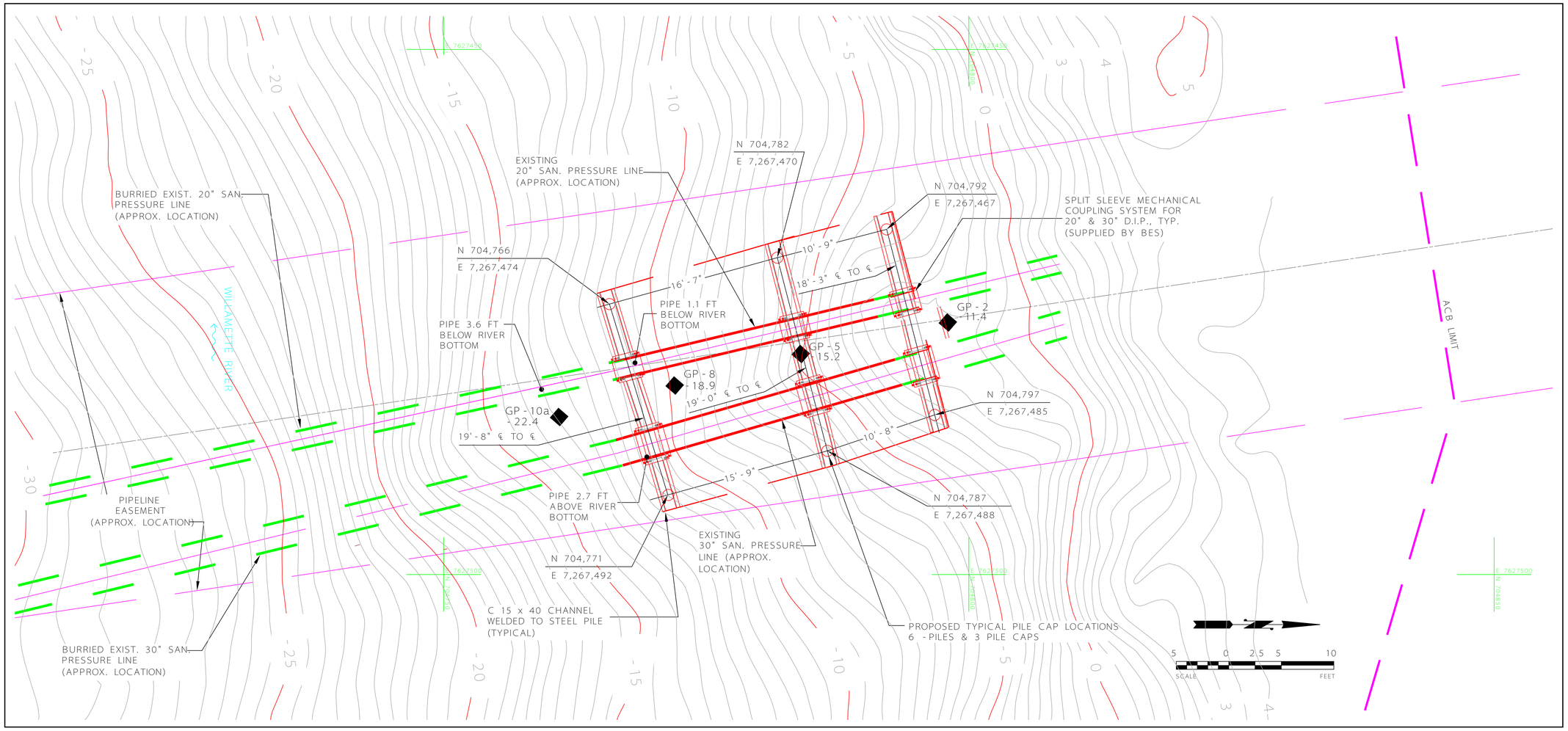
CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

TYTPICAL CONNECTION DETAILS

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. S03
6A OF 6





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LEGEND

- 30 — 5 FOOT MAJOR BATHYMETRIC CONTOUR
1 FOOT MINOR BATHYMETRIC CONTOUR
AS-BUILT ARTICULATED CONCRETE BLOCK (ACB) LIMIT

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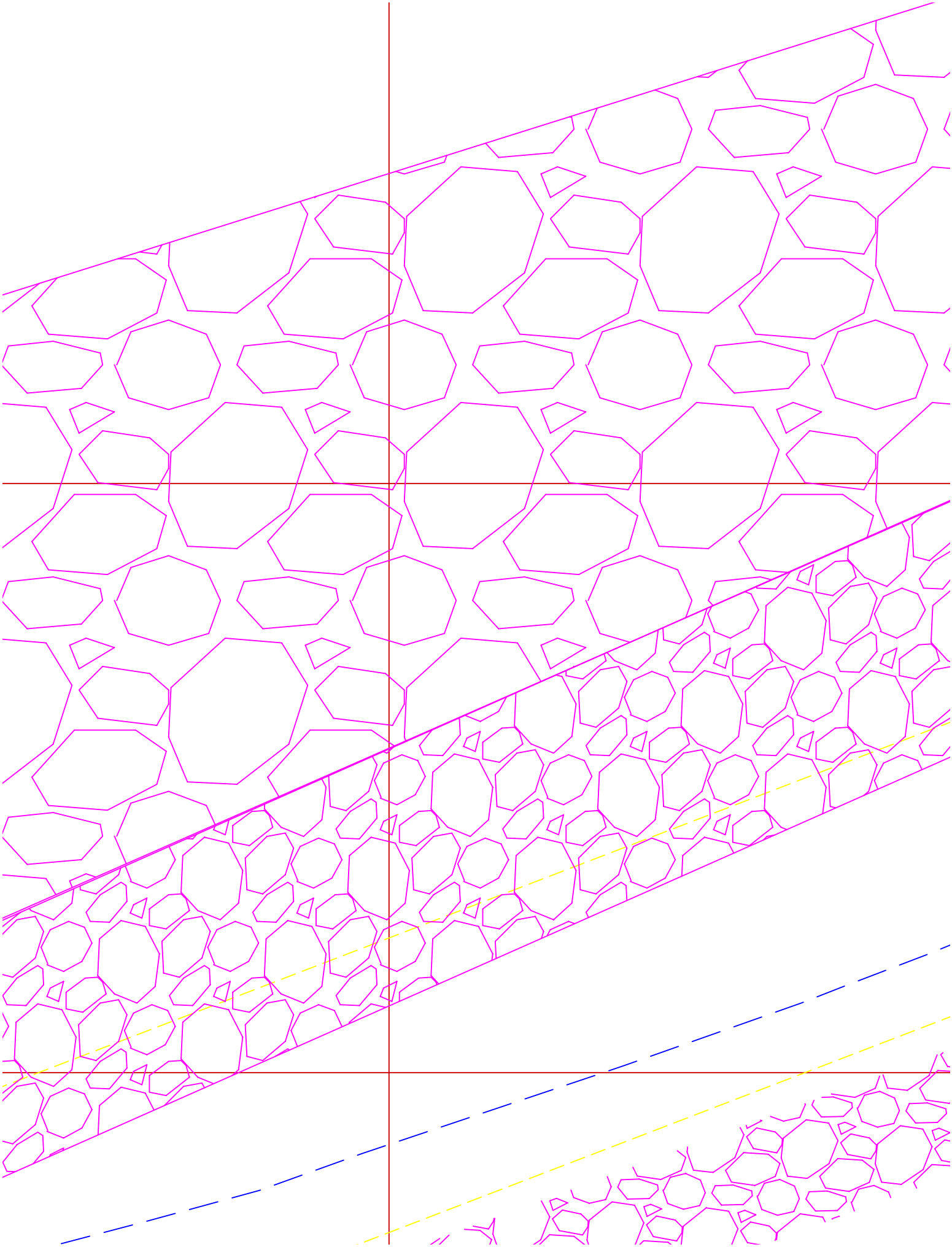
PROJECT COMPLETED:
MAP CORRECTED BY: CHECKED BY:
FINAL MAP DATA
7922C01.dwg, 05/04/05 at 14:29

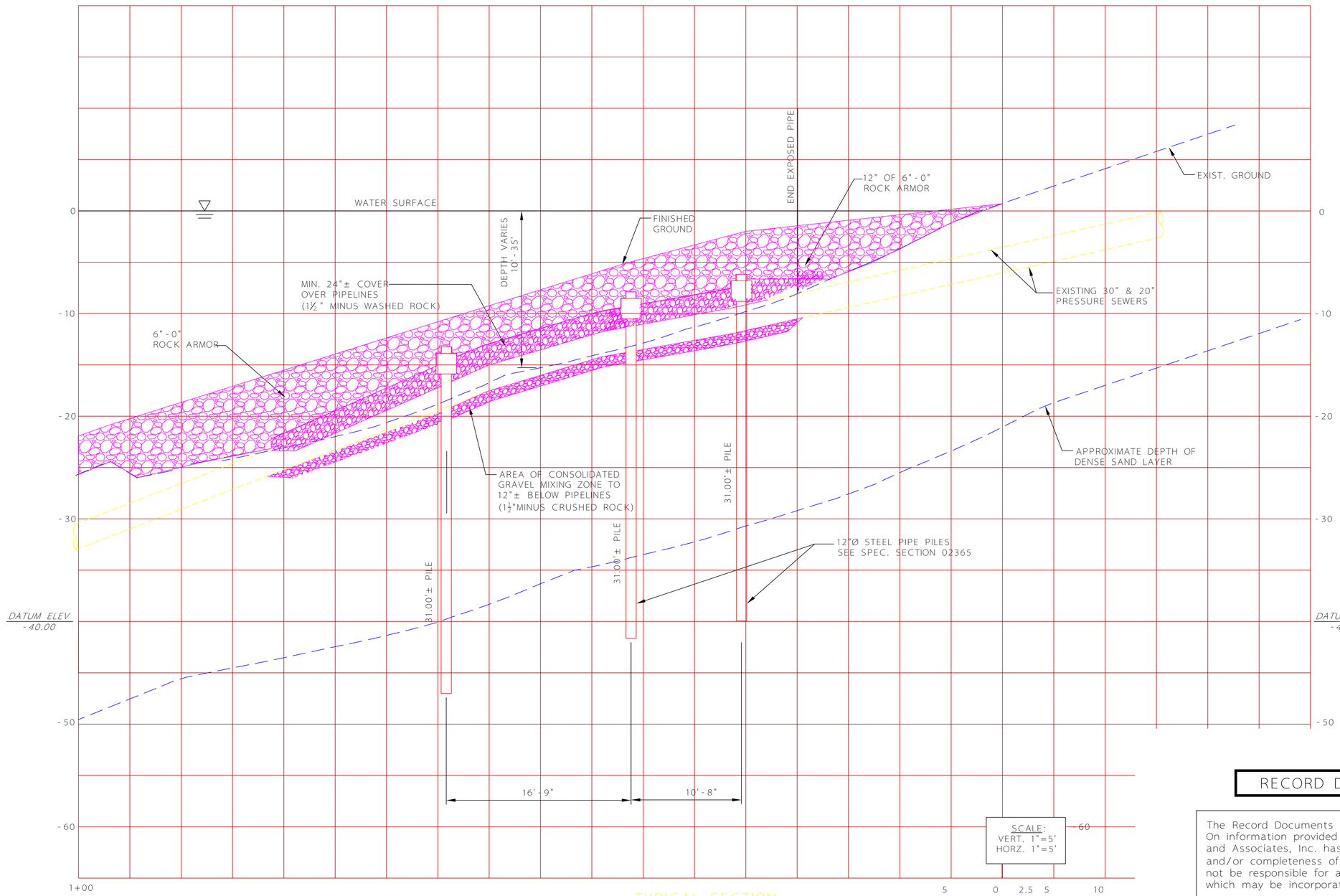
DESIGNED BY: JAG
DRAWN BY: EKB
CHECKED BY:
DESIGN MGR.:
DATE APPD.
PROGRAM MGR.
CONST. MGR.: PGG

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION
PROPOSED LIMITS OF ARMOR ROCK

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. C01
2 OF 6





NOTE:
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TYPICAL SECTION
N.T.S.

5 0 2.5 5 10
SCALE FEET

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7922C02.dwg, 05/04/05 at 14:35

DESIGNED BY JAG DATE APPD.
DRAWN BY JAG PROGRAM MGR.
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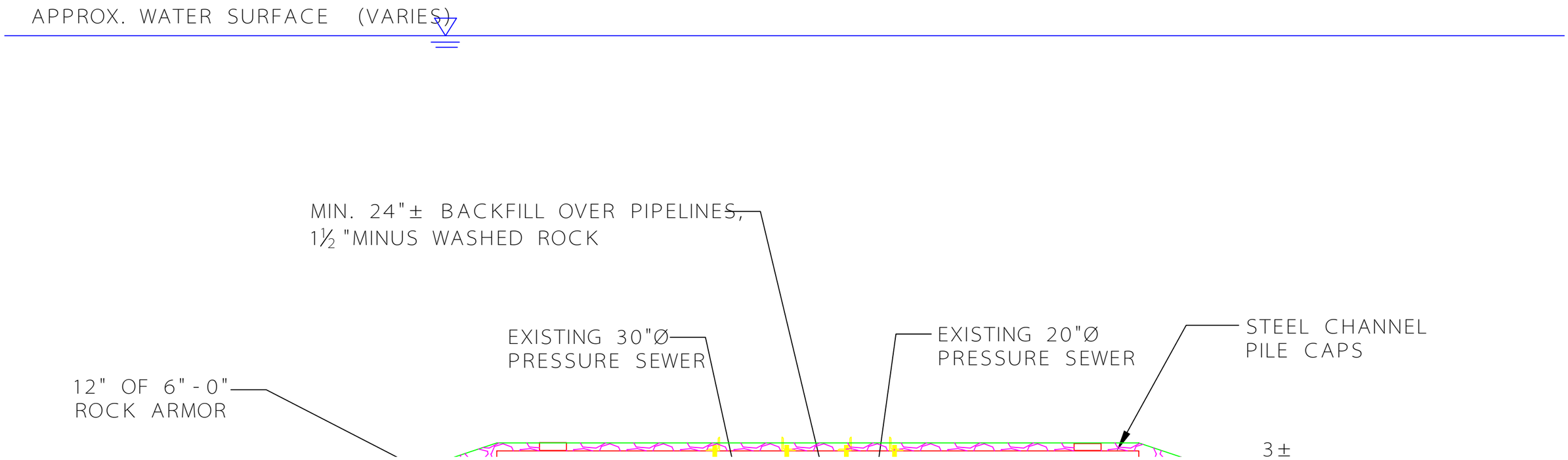
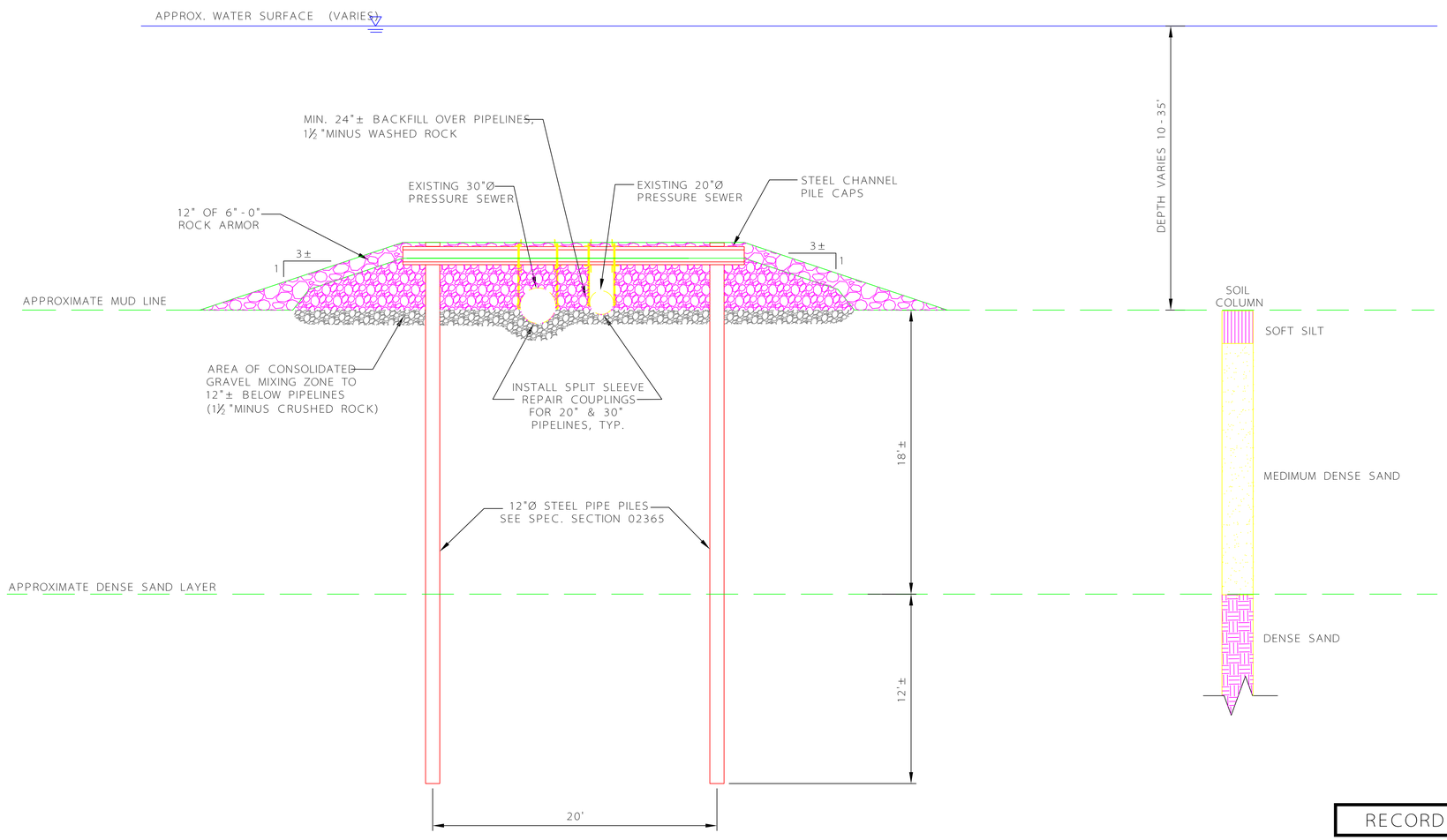
CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

TYPICAL PILE CAP & GRAVEL SECTION

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. C02
3 OF 6


APPROX. WATER SURFACE (VARIES)
MIN. 24"± BACKFILL OVER PIPELINES, 1½"MINUS WASHED ROCK
EXISTING 30"Ø PRESSURE SEWER
EXISTING 20"Ø PRESSURE SEWER
STEEL CHANNEL PILE CAPS
12" OF 6"-0" ROCK ARMOR
3±



TYPICAL SECTION

N.T.S.

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FINAL MAP DATA
7922C03.DWG, 05/04/05 at 14:31

DESIGNED BY JAG | DATE APPD.
DRAWN BY JAG/EKB | PROGRAM MGR.
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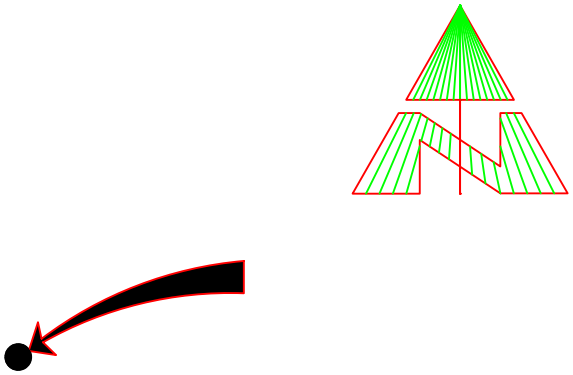
CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

TYPICAL SECTION WITH PILE CAPS

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. C03
4 OF 6



GULA PUMP STATION PRESSURE LINE REHABILITATION PROJECT
PROJECT NO. 7922

LEGEND

- CATCH BASIN
- FIRE HYDRANT
- WATER VALVE
- GAS VALVE
- WATER METER
- MAIL BOX
- SIGN OR POST
- WATER
- SWAMP
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- POWER VAULT
- POWER TRANSFORMER
- POLE ANCHOR
- END OF CULVERT
- AIR VALVE MANHOLE
- DISTILLING MANHOLE
- SAMPLING MANHOLE
- CLEAN OUT
- WATER MANHOLE
- WATER BLOWOFF
- POWER POLE
- LIGHT
- POWER POLE W/ LIGHT
- REGISTRATION TICK TO TOPOG. OVERLAY
- FENCE
- RETAINING WALL
- GUARD RAIL
- EDGE OF PAVEMENT
- CURB
- EDGE OF DRIVEWAY
- CONCRETE PAD
- TREE
- DITCH OR STREAM ; LAKE
- W4 WATER LINE
- G2 GAS LINE
- ELEC ELECTRIC UG
- TEL TELEPHONE UG
- PERMANENT PLUG
- RAILROAD
- STRUCTURE
- UNIDENTIFIED UTILITY OR OBJECT
- EXISTING SANITARY SEWER
- EXISTING INTERCEPTOR SEWER
- EXISTNG FORCE MAIN
- PS EXISTING PUMP STATION
- EXISTING STORM SEWER
- EXISTNG COMBINED SEWER
- EXISTING SANITARY MANHOLE
- EXISTING STORM MANHOLE
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- PROPOSED INTERCEPTOR SEWER
- FM PROPOSED FORCE MAIN
- PS PROPOSED PUMP STATION
- PROPOSED SANITARY MANHOLE
- PROPOSED STORM MANHOLE
- SOIL TEST BORING
- SOIL TEST BORING W/ PIEZOMETER
- SOIL TEST PIT
- EXISTNG DIVERSION MANHOLE
- PROPOSED SEDIMENTATION MH AND SUMP
- INSIDE DROP MANHOLE
- OUTSIDE DROP MANHOLE
- PERMANENT PLUG
- BENCH MARK
- SERVICE LINE PIPE (HOUSE BRANCHES)
- ST SEPTIC TANK
- CP CESS POOL
- PROPOSED STORM INLET
- CONTROL POINT
- IP IRON PIPE OR IRON ROD
- PROPERTY LINE
- PERMANENT EASEMENT

GENERAL NOTES

1. THE LOCATIONS OF EXISTING UTILITY LINES SHOWN ON THESE DRAWINGS HAVE BEEN COMPILED FROM THE BEST AVAILABLE SOURCES AND SUPPLEMENTED BY FIELD SURVEY, BUT ARE TO BE USED FOR INFORMATION PURPOSES ONLY AND THE ACCURACY IS NOT GUARANTEED.
2. ON-SITE CONSTRUCTION PRACTICES SHALL CONFORM TO THE OREGON STATE MANDATED EROSION CONTROL REQUIREMENTS FOR THE COLUMBIA RIVER BASIN.
3. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF PORTLAND STANDARD CONSTRUCTION SPECIFICATIONS.
4. ELEVATIONS SHOWN ON THE CONSTRUCTION DRAWINGS ARE BASED ON CITY OF PORTLAND DATUM-1.375=USC&GS DATUM.
5. PIPELINE LOCATION SURVEY DATA WILL BE PROVIDED TO THE CONTRACTOR BY THE OWNER.
6. PROJECT LOCATION:
   THE PROJECT WORK AREA IS LOCATED IN THE WILLAMETTE RIVER AT APPROXIMATELY RIVER MILE 7, JUST UPSTREAM OF THE BURLINGTON NORTHERN RAILROAD BRIDGE. IT IS SITUATED IN THE SE 1/4 OF SECTION 12, TOWNSHIP 1 NORTH, RANGE 1 WEST OF THE WILLAMETTE MERIDIAN AND IS LOCATED ADJACENT TO THE FORMER MCCORMICK & BAXTER CREOSOTING COMPANY SITE AT 6900 N. EDGEWATER STREET. THE AREA IN WHICH THE PRESSURE LINES ARE EXPOSED IS FROM APPROXIMATELY 30 - 100 FEET FROM THE NORTHEASTERN SHORELINE, AND IN WATER DEPTHS RANGING FROM APPROXIMATELY 10 - 30 FEET.
7. SITE ACCESS:
   THE SITE IS ONLY ACCESSIBLE FROM THE WILLAMETTE RIVER. THE CLOSEST PUBLIC ACCESS POINT IS THE CATHEDRAL PARK BOAT RAMP BENEATH THE ST. JOHNS BRIDGE. ENCLOSED IN THE PROJECT SPECIFICATIONS, AS SUPPLEMENTAL INFORMATION IS AN APPLICATION PACKAGE FOR A NON-PARK USE PERMIT. THIS INFORMATION IS PROVIDED IN THE EVENT THAT THE CONTRACTOR DOES NOT POSSESS OR HAVE ACCESS TO AN ALTERNATE ACCESS POINT, AND WOULD LIKE TO USE THE CATHEDRAL PARK AREA FOR STAGING.

SHEET INDEX

SHEET	TITLE
G01	COVER SHEET, LEGEND, NOTES AND LOCATION MAP
C01	PROPOSED LIMITS OF ARMOR ROCK
C02	TYPICAL PILE CAP & GRAVEL SECTIONS
C03	TYPICAL SECTION WITH PILE CAPS
S01	TYPICAL PILE BENT - PLAN VIEW
S02	TYPICAL CONNECTION DETAILS

BENCH MARK

HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 - 91 ADJ. (NAD83/91), STATE PLANE COORDINATE SYSTEM (SPCS), OREGON NORTH ZONE.

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ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER. THE CENTER BUSINESS NUMBER IS (503) 232-1987. ONE OF THE REQUIREMENTS OF THESE RULES IS THAT EXCAVATORS MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. TO COMPLY WITH THIS REQUIREMENT, CALL 246-6699 (IN THE LOCAL PORTLAND AREA) OR CALL 1-800-332-2344.

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

NOT TO SCALE
VICINITY MAP

NO.	DATE	DESCRIPTION	APPD.
1	11/29/05	"AS CONSTRUCTED"	JAG

REVISION

XREF(S) USED:
ROTATION ANGLE
CONSTRUCTED BY
PROJECT COMPLETED
MAP CORRECTED BY CHECKED BY
FINAL MAP DATA
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DESIGNED BY JAG DATE APPD.
DRAWN BY EKB PROGRAM MGR
CHECKED BY CONST. MGR. PGG
DESIGN MGR.

CITY OF PORTLAND
ENVIRONMENTAL SERVICES
APPROVAL

WILLIAM F. RYAN, P.E.
CHIEF ENGINEER

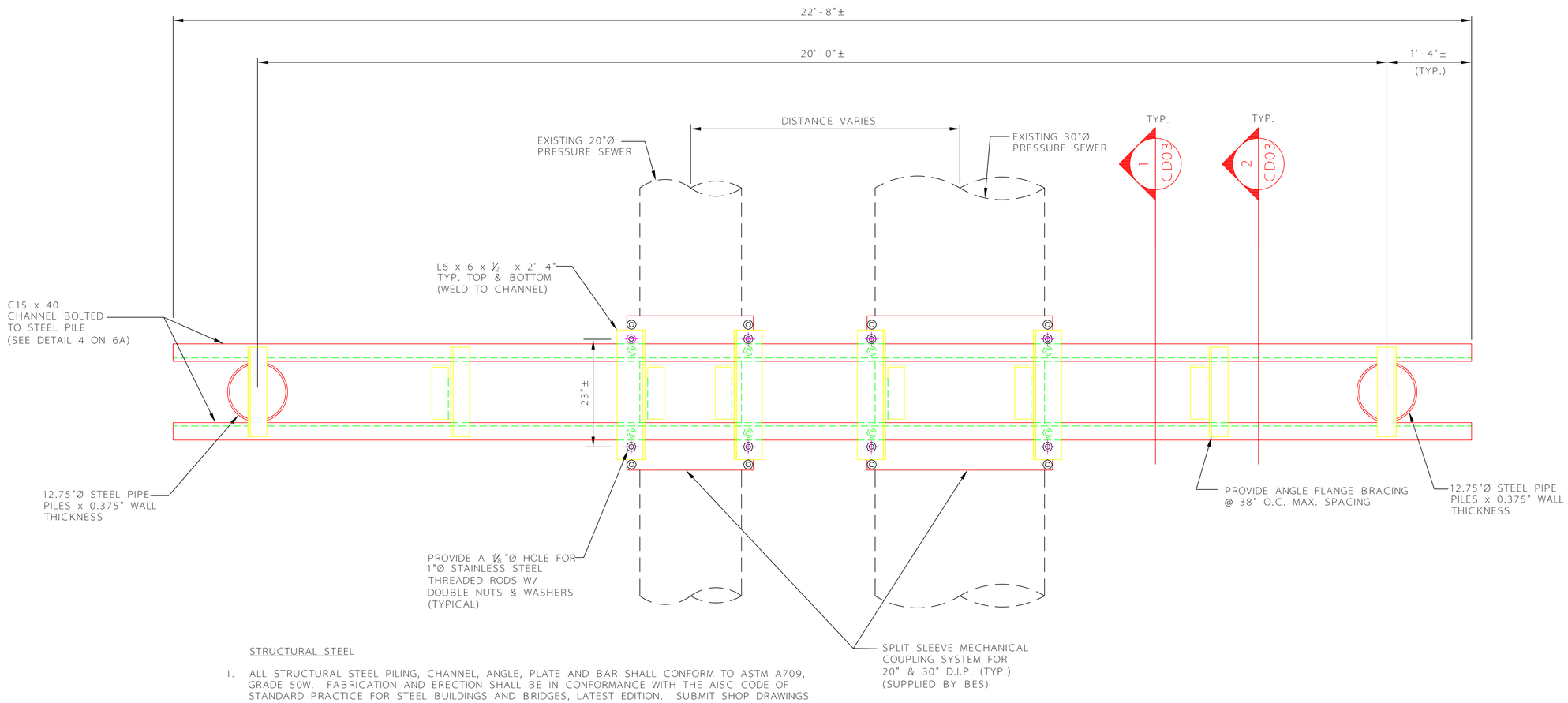
ENVIRONMENTAL SERVICES CHIEF ENGINEER
REG. PROF. ENGR. NO. 16301

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

COVER SHEET
LEGEND, NOTES AND LOCATION MAP

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. G01
1 OF 6

WELD IS TYPE 316 WS D1.5 SHALL BE PERFORMED BY



STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL PILING, CHANNEL, ANGLE, PLATE AND BAR SHALL CONFORM TO ASTM A709, GRADE 50W. FABRICATION AND ERECTION SHALL BE IN CONFORMANCE WITH THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, LATEST EDITION. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.
2. NO ATTEMPT HAS BEEN MADE TO DIFFERENTIATE BETWEEN SHOP AND FIELD WELDED CONNECTIONS. ALL WELDING IS TO COMPLY WITH AWS SPECIFICATIONS AND IS TO BE PERFORMED BY CERTIFIED WELDERS.
3. PROVIDE A 3/16" WELD UNLESS A LARGER SIZE OF FILLET WELD IS SPECIFIED ON THE PLANS,
4. BOLTED CONNECTIONS SHALL CONFORM TO ASTM F593, TYPE 316 STAINLESS STEEL.
5. ALL WELDING SHALL BE PREQUALIFIED PER AISC AND AWS D1.5 SPECIFICATIONS (AWS D3.6 WHEN WELDING OCCURS UNDERWATER). ALL WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS BY ELECTRIC ARC PROCESS WITH E70XX ELECTRODES. SHOP WELDS SHALL BE PERFORMED IN THE SHOP OF AN APPROVED FABRICATOR.

TYPICAL PILE BENT - PLAN VIEW

N.T.S.

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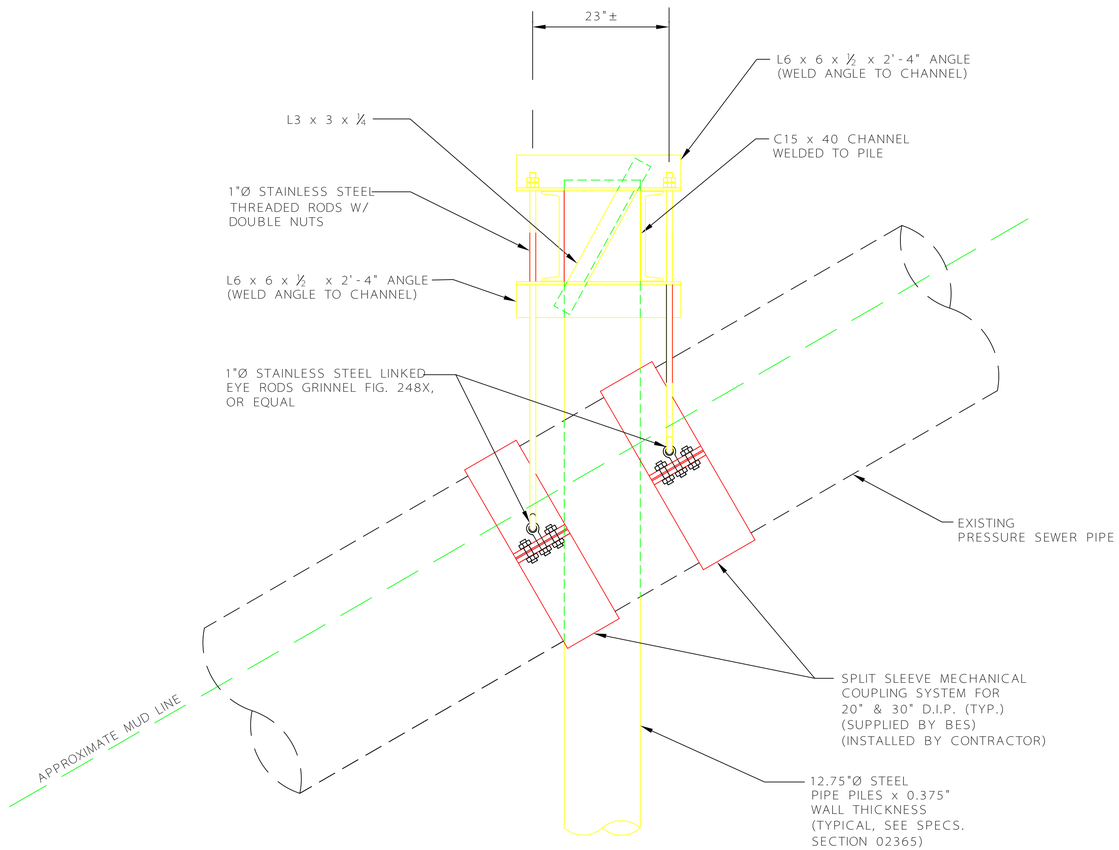
DATE APPD.
PROGRAM MGR.
CONST. MGR. PGG

CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

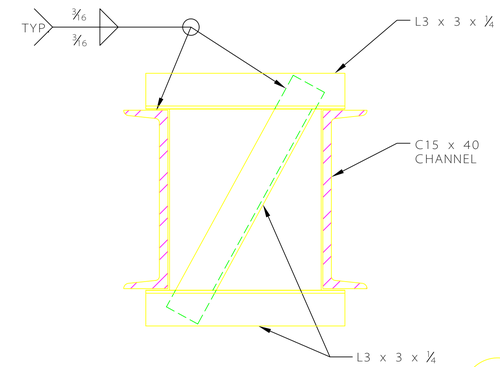
TYPICAL PILE BENT
PLAN VIEW

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. S01
5 OF 6



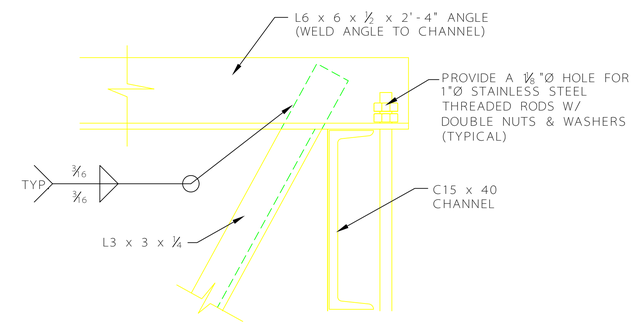
TYPICAL AS-BUILT CONNECTION DETAIL 1

N.T.S.



FLANGE BRACING DETAIL 2

N.T.S.



CONNECTION DETAIL 3

N.T.S.

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PROJECT COMPLETED:
MAP CORRECTED BY: CHECKED BY:
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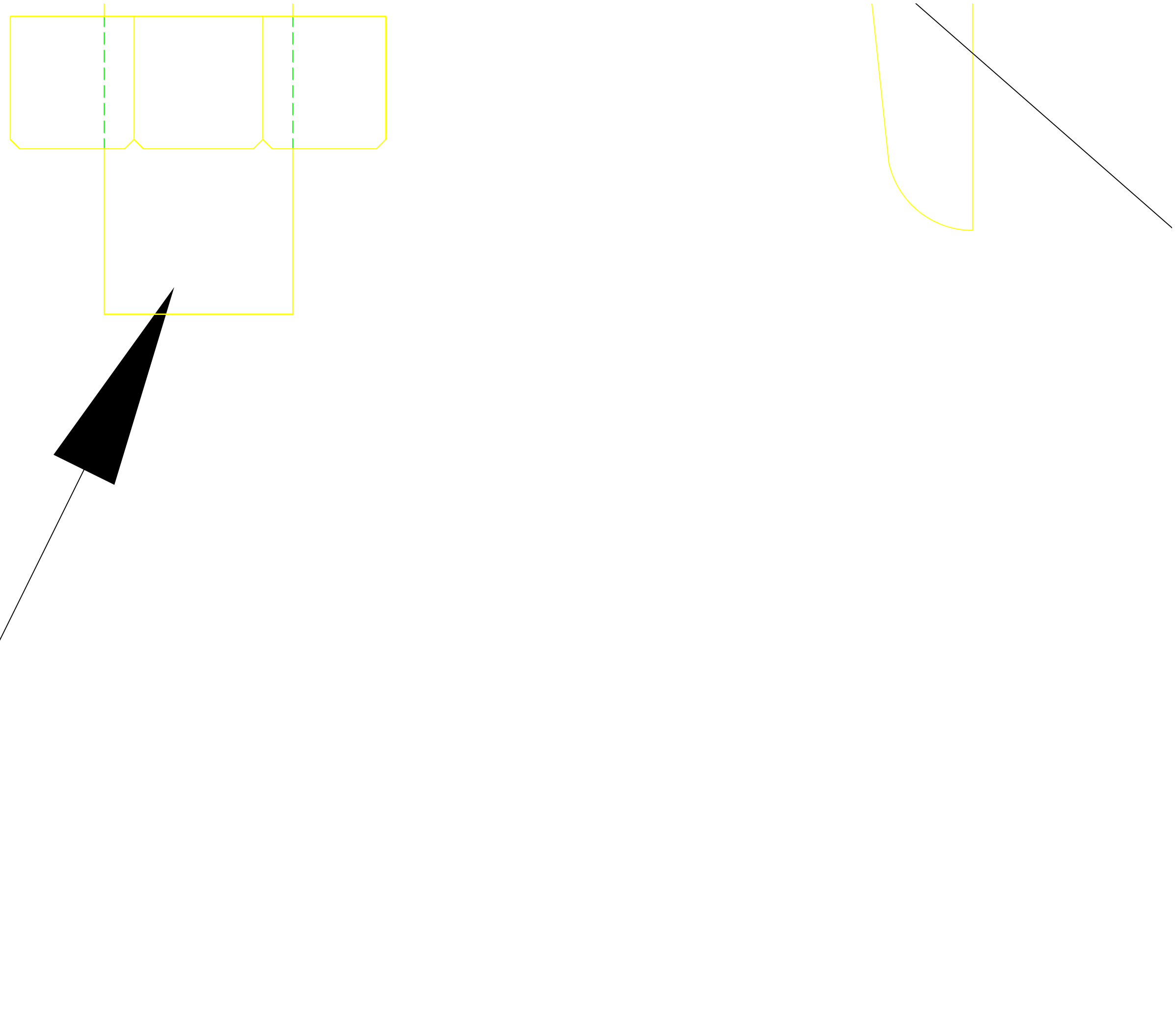
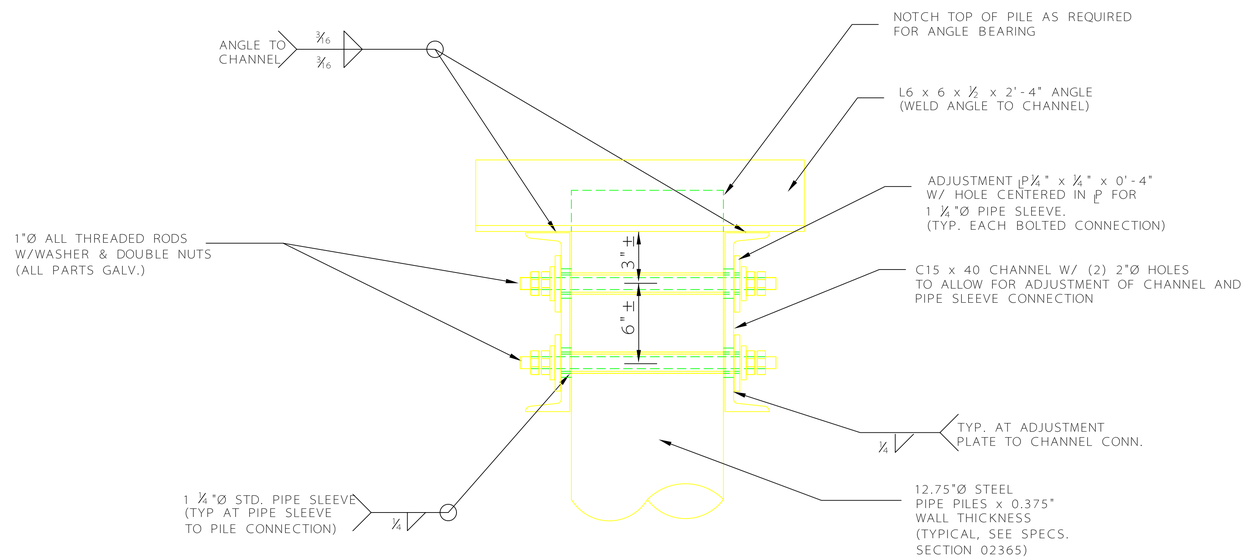
CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

TYTPICAL CONNECTION DETAILS

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. S02
6 OF 6





TYPICAL AS-BUILT BOLTED CONNECTION DETAIL

N.T.S.

4
-

RECORD DRAWINGS

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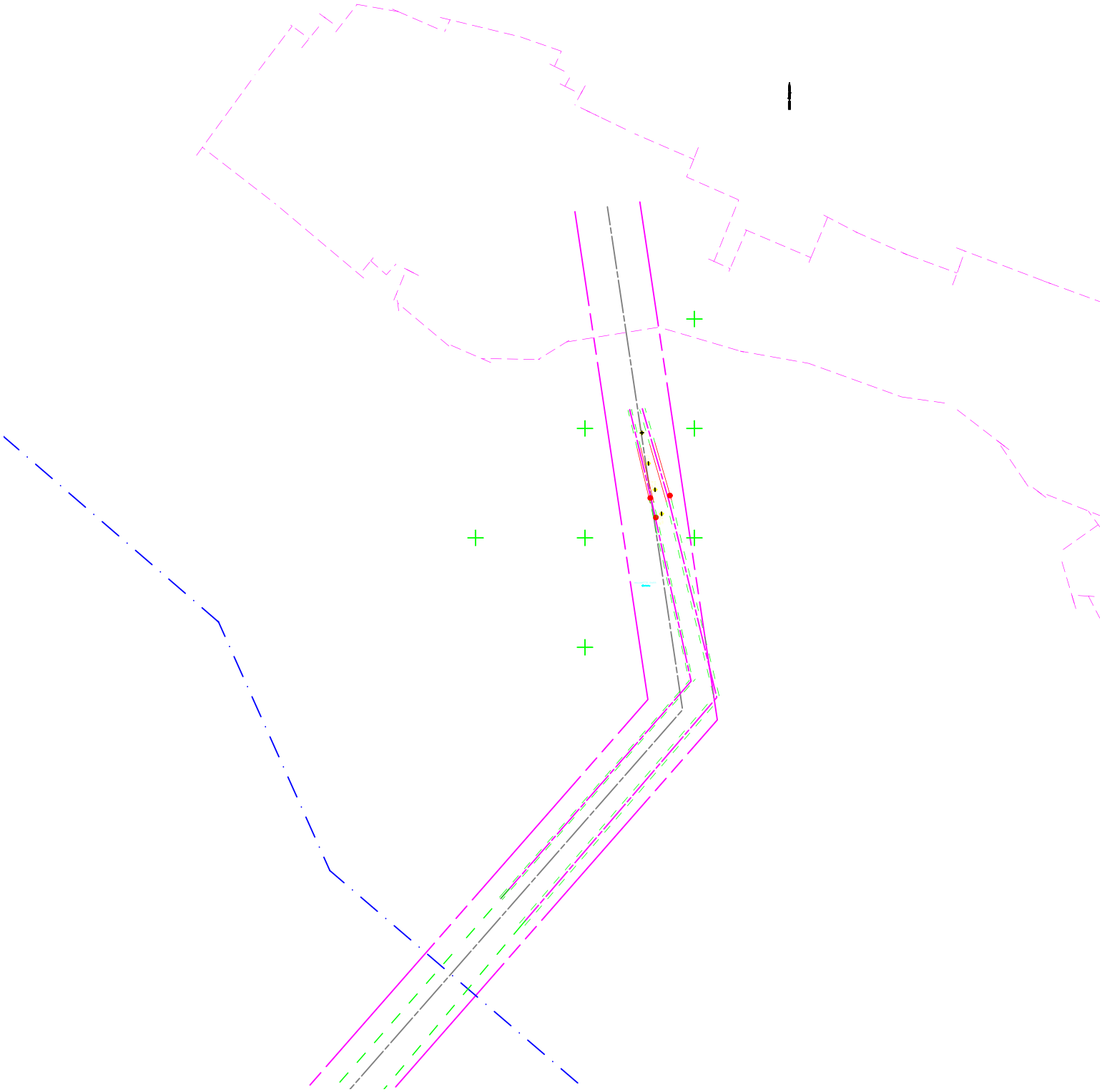
CITY OF PORTLAND
ENVIRONMENTAL SERVICES

GUILDS LAKE PUMP STATION
PRESSURE LINE INVESTIGATION

TYTPICAL CONNECTION DETAILS

1/4 SECTION 2223
JOB NO. 7922
SHEET NO. S03
6A OF 6



E 7627450
N 704700
E 7627450
N 704750
E 7627450
N 704800
WILLAMETTE RIVER
GP - 2
-11.4
GP - 5
-15.2
GP - 8
-18.9
GP - 10a
-22.4
E 7627500
N 704750
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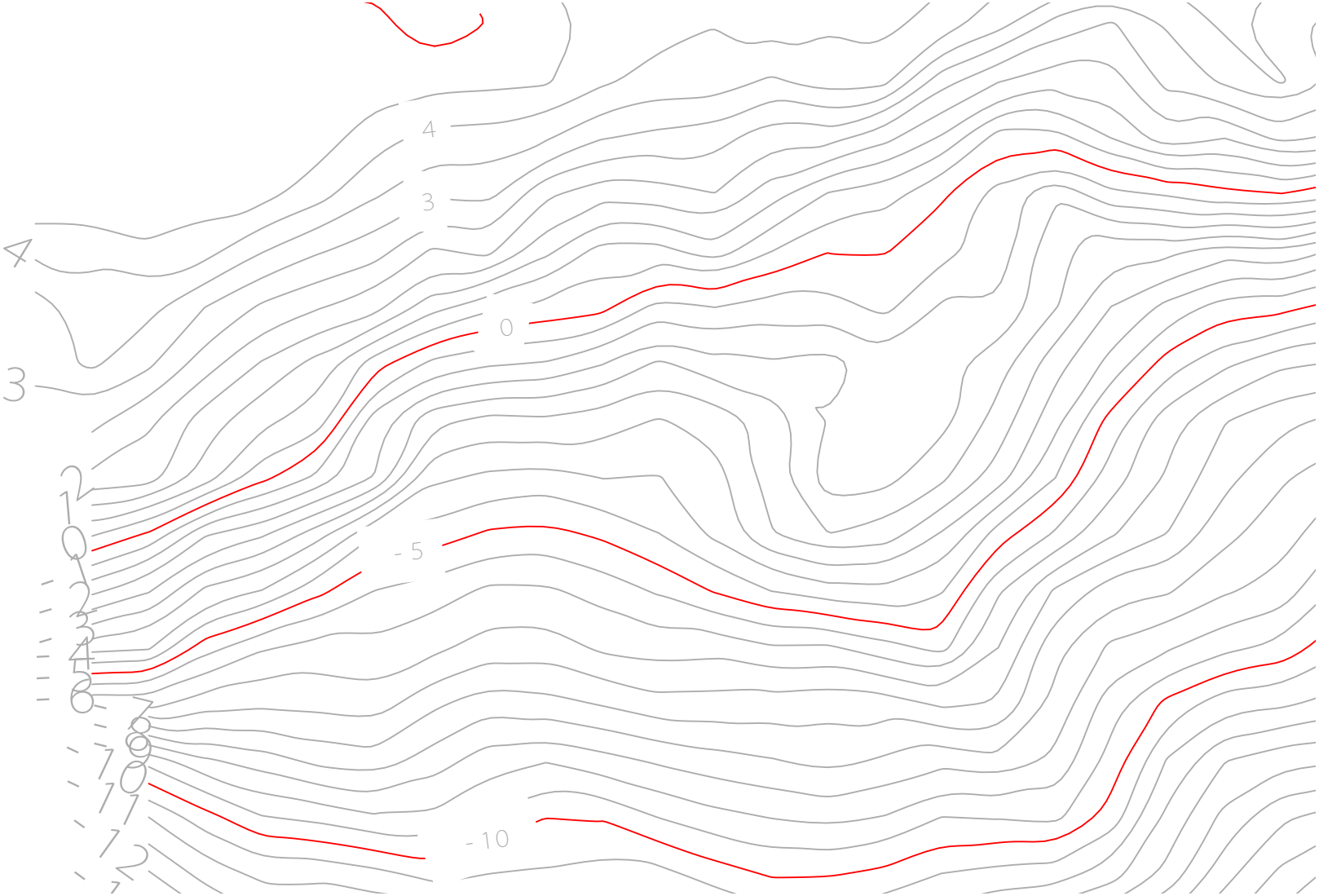
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E Submittals

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Submittals

Sediment Cap Completion Submittals				
Submittal	**Section**	**Description**	**Date Received**	**Comments**
01310-1	01310	Construction schedule	8/2/2005	
01310-2	01310	Progress/2-week look-ahead schedules	N/A	Mostly verbal during weekly meetings.
01330-1	01330	The site-specific safety and health plan submitted to the city	8/8/2005	
01330-2	01330	Safety and health incident reports	N/A	No incidents to report.
01450-1	01450	Identification of QCI, record-keeping procedures, and potential corrective actions narrative	8/8/2005	Included in *Construction Means and Methods.*
01450-2	01450	Record of corrective actions	N/A	No corrective actions were taken.
01450-3	01450	Field inspection notebooks		
01560-1	01560	Spill, Prevention, Control, and Countermeasures (SPCC) Plan, inspection schedule, and inspection checklist; the ESPCP submitted to the city may be substituted	8/2/2005	Submitted ESPCP that was submitted to the city.
01560-2	01560	In-Water Environmental Protection Plan, inspection schedule, and inspection checklist; the ESPCP submitted to the city may be substituted	8/2/2005	See Submittal 01560-1: ESPCP.
01560-3	01560	Inspection schedule for environmental protection measures not included above	8/2/2005	See Submittal 01560-1: ESPCP.
01560-4	01560	Proposed corrective actions should water quality action levels be exceeded	8/8/2005	Verbal; also discussed in Submittal 01560-1: ESPCP and Submittal 01450-1: *Construction Means and Methods.*
01580-1	01580	Utility and subsurface feature identification and protection	8/8/2005	Verbal.
01700-1	01700	Logbooks; Contract closeout letters/certifications/documentation		
01700-2	01700	Punch list/schedule for completion	N/A	Verbal during weekly meetings.
01700-3	01700	Pre-final examination notification		
01700-4	01700	Final examination notification and written notice of work completion		
02145-1	02145	Survey equipment, personnel, and methods	N/A	E&E was familiar with DEA, subcontracted by AAC for surveying services.
02145-2	02145	Field notebooks, calculations, record drawings, and electronic files	9/20/2005	All material placement calculations and electronic files were submitted in hard copy and electronic form at project completion.
02210-1	02210	Sediment cap placement narrative	8/8/2005	See Submittal 01450-1: *Construction Means and Methods.*
02210-2	02210	Import material source information	8/1/2005	
02210-3	02210	Test results	N/A	Same material used in 2004 sediment cap construction.
02210-4	02210	Import material samples	N/A	Same material used in 2004 sediment cap construction.
02210-5	02210	Sediment capping progress data	9/6/2005	All data submitted in hard copy and electronic form at completion of sand placement; data was approved onsite daily by E&E. See Submittal 02145-2.

Submittals

02230-1	02230	Armoring narrative	8/8/2005	See Submittal 01450-1: *Construction Means and Methods.*
02230-2	02230	Import material source information	8/2/2005	
02230-3	02230	Test results	8/2/2005	
02230-4	02230	Import material samples	N/A	All material used, other than riprap, was the same as that used in 2004 sediment cap construction. Riprap material was approved at the source by E&E with AAC.
02230-5	02230	Armoring progress report	9/20/2005	All data submitted in hard copy and electronic form at completion of armoring placement; data was approved onsite daily by E&E. See Submittal 02145-2.
02410-1	02410	Transportation methods narrative	8/8/2005	See Submittal 01450-1: *Construction Means and Methods.*
02410-2	02410	Records and manifests for import materials	9/20/2005	Received last weight receipt on 9/20/05; weight receipts were submitted ongoing following importation.
02410-3	02410	Off-site scale certifications	9/14/2005	
02410-4	02410	Naval architect draft charts	N/A	Draft measurements were not used during construction.

SUBMITTAL 01310-1

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E&E Transmittal Received # 1

ADVANCED AMERICAN
DIVING SERVICE, INC.
415 S. McLoughlin Blvd. P.O. Box 1630
Oregon City, Oregon 97045
503-650-8207 Fax 503-650-8230

TRANSMITTAL FORM

To: Ecology and Environment, Inc.
2101 Fourth Ave., Suite 1900
Seattle, WA 98121

Ph: 206-624-9537
Fax: 206-621-9832

Attention: Susan Gardner

Date:	8/1/05	**Job No:**	1105-533
Job Name:	McCormick & Baxter Sed Cap		
Job Location:	Portland., OR		
RE:	Submittal - Schedule		

We are sending you herewith the following items:

- [ ] Plans
- [ ] Specifications
- [ ] Prints
- [ ] Shop Drawings
- [ ] Samples
- [ ] Catalogue Cuts
- [ ] Purchase Order
- [ ] Change order
- [ ]

Copies	Dated	No.	Description
~~6~~ 3	8/1/05	01310-1	Construction Schedule

These items are transmitted as checked below:

- [x] For approval
- [ ] For your use
- [ ] As requested
- [ ] For review and comment
- [x] Approved as submitted
- [ ] Approved as noted
- [ ] Returned for corrections
- [ ] _____

REMARKS:

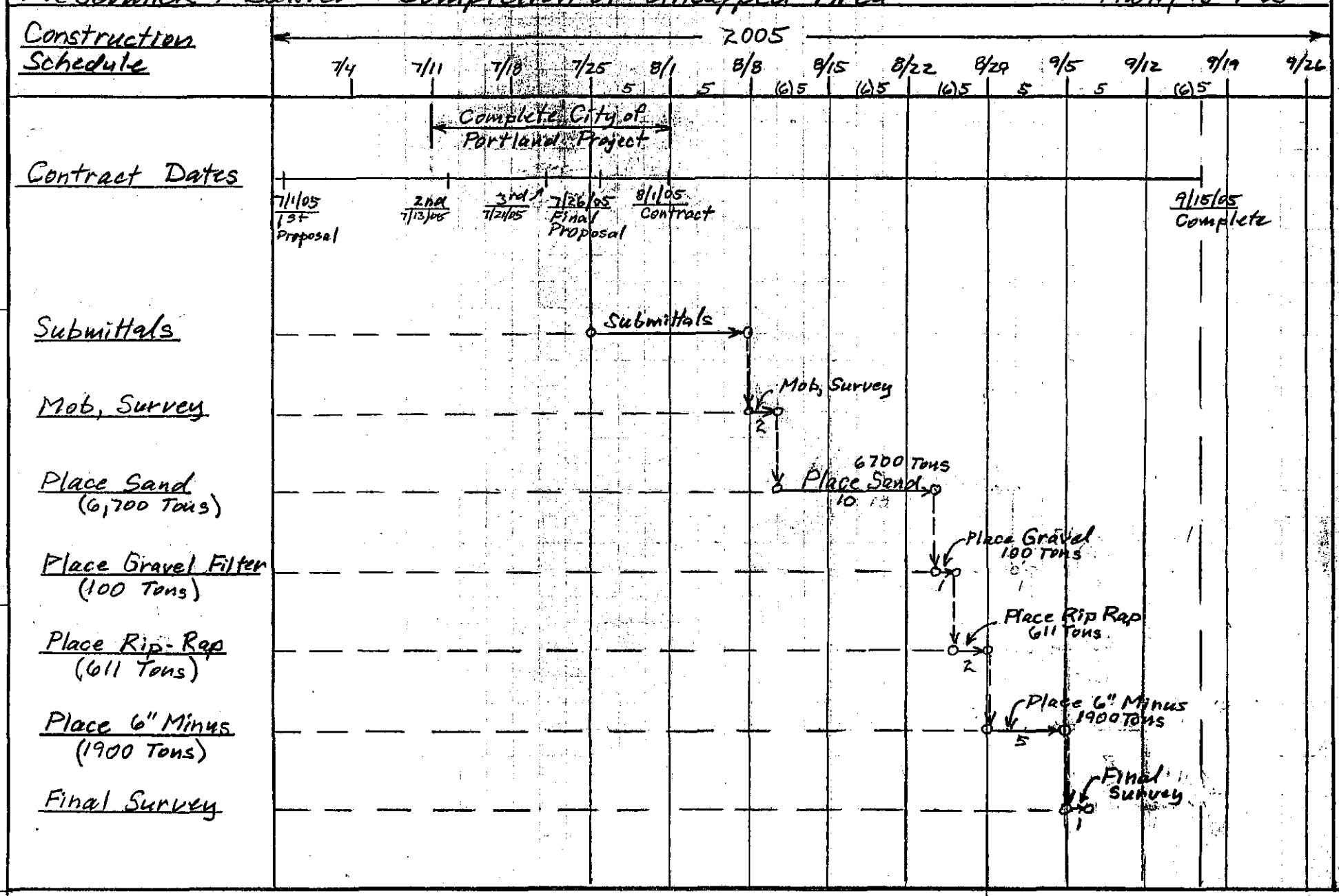
Copy To: _____

Signed: M. W. Nelson
Mike Nelson

Advanced American Diving Service, Inc.

McCormick & Baxter - Completion of Uncapped Area

MWH / 8-1-05



STAEDTLER® No. 937 811E Engineer's Computation Pad

SUBMITTAL 01330-1

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E+E Transmittal Rec'd #4

ADVANCED AMERICAN
DIVING SERVICE, INC.
415 S. McLoughlin Blvd. P.O. Box 1630
Oregon City, Oregon 97045
503-650-8207 Fax 503-650-8230

TRANSMITTAL FORM

To: Ecology and Environment, Inc.
2101 Fourth Ave., Suite 1900
Seattle, WA 98121

Ph: 206-624-9537
Fax: 206-621-9832
Attention: Susan Gardner

Date:	8/8/05	**Job No:**	1105-533
Job Name:	McCormick & Baxter Sed Cap		
Job Location:	Portland.,OR		
RE:	Submittals - Health & Safety		

We are sending you herewith the following items:

- ☐ Plans
- ☐ Specifications
- ☐ Prints
- ☐ Shop Drawings
- ☐ Samples
- ☐ Catalogue Cuts
- ☐ Purchase Order
- ☐ Change order
- ☐

Copies	Dated	No.	Description
6	8/8/05		Health & Safety Plan

These items are transmitted as checked below:

- ☒ For approval
- ☐ For your use
- ☐ As requested
- ☐ For review and comment
- ☐ Approved as submitted
- ☐ Approved as noted
- ☐ Returned for corrections
- ☐ _____

REMARKS:

As suggested, we have used the JSA that was submitted for the City of Portland Pipeline Repair Project.

Copy To: _____

Signed: Jake Duyck

Advanced American Construction

Job Safety Analysis and Training Specification

ADVANCED AMERICAN DIVING SERVICE, INC.
MARINE CONSTRUCTON & CONSULTING
P.O. Box 1630
415 S. McLoughlin Blvd. - Oregon City, OR 97045
503-650-8207 - Fax 503-650-8207

PROJECT TITLE: City of Portland BES
PROJECT DESCRIPTION: Guilds Lake Pump Station Pressure Line Rehabilitaion
AADS JOB #: 1105-528
DATE: July 11- 31, 2005

HAZARD ANALYSIS

Steps	Issues	Job Requirements	OK
Mobilization/ Demobilization	Pre job safety meeting	Perform safety meeting with review of scope to be performed.	____
		Perform daily safety pre dive meetings, and review work to be performed.	____
		Identify any potential hazard for lockout - tagout.	____
		Provide flagging tape around hazardous work areas ie. crane operations, beach equipment operations.	____
		Attend Daily Safety Meeting and Review daily activity and hazards associated.	____
	Equipment Failure	Inspect equipment daily.	____
		Preventative maintenance to be conducted on regular intervals.	____
	Staging of equipment.	Stage equipment in designated areas.	____
General duties	Emergency preparedness	Participate in emergency drills and be aware of evacuation routes	____
		Make sure that medical emergency numbers, names and telephone numbers of designated physicians, ambulance service and hospitals are posted	____
		Make sure that first aid providers are onsite and supplies are adequate for chemical and physical hazards present; and that MSDS's and early return to work packets are available	____
		Assure fully charged, inspected, and proper extinguishers are in the work area	____

Steps	Issues	Job Requirements	OK
		Know where the first aid supplies are located and who the responders are	____
	Exposure to falling materials- foot and head injuries	Wear hard hat	____
	Exposure to flying material- eye injury	Assure that eye wash supplies are available	____
		Maintain equipment in clean and sanitary condition and replace as needed	____
		Always wear properly fitted safety glasses (meeting current ANSI Standard) with side shields, or goggles when in areas either posted for eye protection, or where flying materials could be present (e.g., grinding, compressed air use, hammering, etc.)	____
	Exposure to high noise environments or tasks	Orientation and annual training as to the effects of noise, proper selection and fit of hearing protectors, and information about the hearing tests	____
		Wear properly fitted hearing protection that has an adequate hearing protection rating for the noise levels to which you are exposed. Inspect and repair or replace as needed	____
	Slips/trips/falls	Do clean-up of work area prior to all breaks and at the end of each shift	____
		Report any areas that are continual problems to supervisor and safety committee immediately to correct	____
		Wear shoes with non-slip soles	____
		Keep all work surfaces well maintained and free of trip, and slip hazards	____
Lifting, and material handling	Strains and sprains	Limit weights lifted as much as possible and report any difficult lifts for re-design action	____
		Use two-person lift for heavier and awkward loads; and assist equipment (scissor lifts, dollies, forklifts etc.) to eliminate lifts	____
		Do Not twist when lifting; move your whole body instead	____

Steps	Issues	Job Requirements	OK
		Use legs, not back - keep back vertical during lift	____
Boat & Barge Operations.	Diver in water.	Secure motors while the diver is in the water.	____
		Notify the diver if barge movement is to occur while the diver is in the water.	____
		Notify transfer boat of when diver is in the water.	____
		Display Divers Alpha flag when diver is in the water to give notice to other crew and river traffic that dive operations are in progress.	____
Dive Schedules	US Navy Dive Tables	US Navy Standard Air Decompression Table	____
		No-Decompression Limits and Repetitive Group Designation Table for No-Decompression Air Dives	____
		Residual Nitrogen Timetable for Repetitive Air Dives.	____
Diving Operations	LOCK OUT / TAG OUT OF POTENTIAL ENERGY / HAZARD SOURCES.	identify potential sources to be isolated.	____
		Lock out potential sources to eliminate operation.	____
		Educate & inform crew of hazards and lock out / tag out action.	____
	Equipment Procedures Checklist	Assemble dive station complete with primary and standby system. Check complete system.	____
		Check diver communications system.	____
	Dive records.	Dive records shall be kept for each diver for each dive. Stopwatches will be kept separately for each diver.	____
	Diver access, water entry.	Establish Emergency digress tripod.	____
		During pipe penetration, tend diver from advantage point at invert of pipe.	____
		Check ladder access prior to using.	____
	Debris in water.	Divers and tenders to look for debris in water prior and during diving operation.	____

Steps	Issues	Job Requirements	OK
	Dive hose fouling.	Diver will be tended in such a manor to minimize hose fouling.	____
	Divers dress in area.	Inspect suit for tears, damaged fittings and proper size for the diver.	____
	Divers communications.	Check communications prior to dive, have spare communication box set up at dive station. Make sure all members of the dive crew know the divers line hand signals. If two divers are in the water both divers be informed of any crane movement prior to the crane operator receiving a movement command. If the diver other than the diver giving the crane movement commands order the crane to stop it's movement, all crane movement shall be stopped until both divers agree as to what is taking place and both divers agree to continue with the cranes movement.	____

Steps	Issues	Job Requirements	OK
Crane use	Falling material- crush, fracture	MOVING LOAD: STAY AWAY FROM ANY POWER LINES OR SOURCES OF POWER (20' MINIMUM) -Assure clearance for the sling and clear path of travel, and place is clear for placing load, before lift begins. -Have place ready for lowering load...never rest load on slings -Lift load slowly and cautiously to avoid "impact loading"...jerking or snapping the load can cause loads in excess of weight of load. -Keep all clear of lift area as rigging may fly free at start of lift. Lift load a few inches to assure all rigging properly set, that there are no kinks or twists, and load is balanced -Do not drag slings on floor -Lift load to height needed for path of travel -Use "tag lines" to guide loads as needed -Never allow anyone to be on load when lifted, or to ride a load or lifting hook -Do not use crane for side pulls without prior review of lift by crane trainer. If approved for side pull, pull parallel to trolley, do not use hoist -If two cranes need to be used simultaneously for a lift, one of the crane trainers (competent persons) must be present to assure proper rigging, operation, loading, positioning and movement -Do not allow loads to be lowered to a point where less than two full wraps of rope remain on the hoisting drum -Brakes need to be tested for loads approaching the rated limit of the crane. This can be done by slowly an cautiously lifting the load a few inches, and applying the brakes -Never stand under a load. Keep all others out of the load travel area. Do not leave suspended load. As load approaches personnel, warning shall be given -Walk behind a load as it travels, looking ahead	____

Steps	Issues	Job Requirements	OK
		Attachment: -ropes and chains are to be free of kinks and twists, and are not to wrap around load. -slings are to be used for attachment of the load to the block hook. Slings must be designed by the manufacturer for hoisting -use sling of proper reach (never shorten by twisting, etc.), And set-up (basket hitch, choker, spreader beams, etc.) to assure stable, secure, and balanced load attachment -use Multi-legged sling as opposed to combination of single slings -Do not use an angle of lift less than 30 degrees as it puts excessive loads on sling legs -Assure load is centered in base of hook, and that hook is facing away from load. Do not force hook into load as it can damage hook -block hook is to be moved directly over the load for attachment to prevent load swing/shift when lift takes place -make sure load to be lifted is not attached to anything, and that it has no lose pieces of material on it. -use pads at sharp edges to prevent damage to slings	____
		You must be trained and certified for use of this equipment	____
		Inspection: -use daily inspection form for check of equipment.. Check slings, ropes, hooks, dogs, and chains for wear and damage. Check hoist, bridge and trolley function, limit switches, and controls. -Do not use equipment with noted problems. Take out of service, and report problems. -store slings in designated location, off the ground and where they are protected -assure that yearly inspection has been done	____

Steps	Issues	Job Requirements	OK
		Weight limits: -never exceed weight limits of system or components (slings are to indicate limits on tag). Know weight you are lifting and do not guess. Note: a 1" thick piece of mild steel that is 12" square weighs about 42 lb., And solid piece of mild steel that is 1 cubic foot weighs about 500 lb. -assess load, identify load center, and sling capacity based on rigging set-up and manufacturer's rigging table. Determine weight/force applied to sling legs and assure within rated capacity of sling. Use proper sling set-up for loads that do not have a central load center (proper leg lengths)	____
	Working around other activity.	Maintain communication with dive crews. When involved with picking with divers, Operator to take signals by Dive Master Only.	____
	Loading Material Barges	Be aware of pinch points in loading material barges.	____
		Support load with appropriate cribbing to secure, and stabilize.	____
		Secure loads as required to prevent shifting.	____
Equipment to be used.	Use of Crane.	Crane operator to take signals from the Dive Master, Stay clear of all loads.	____
		Divers to be informed by topside communications of crane movement. An external speaker in connection with the working diver will be installed to keep topside crew informed of diver crane signals.	____
	Surface Supply Dive Equip.	Scheduled testing of air systems & hoses.	____
	Water Pumps & Inductors	Equipment to be monitored by topside personnel.	____
		Back flush as required to halt suction.	____
	Video Equipment.	Visual inspection of all electrical connection and wire jacket conditions.	____
	Under water Burning & Welding	Adequate grounding of system.	____

Steps	Issues	Job Requirements	OK
		Welding cables, electrode holders and connections shall be properly insulated, and capable of carrying the minimum current required by the work.	____
		Welding electrical circuits shall have a positive disconnect switch (knife switch). The knife switch shall remain open except at diver command during actual welding or burning.	____
		Insulated gloves shall be worn.	____
		To avoid explosion, properly vent closed compartments to prevent build up of explosive inert gas.	____
	Hand-Held Power Tools/ Pressure Washer.	Tools shall have a constant pressure switch control.	____
		Hand-held power tools shall not be supplied with power from the dive location until requested by the diver.	____
		Diver to verify area clear before hand-held power tools are used. i.e. dive hose, power hose, other divers hose.	____
Demobilization	Securing equipment for transportation	All equipment to be chained down and secure, or welded to deck.	____
		All bottles to be secured in proper storage racks.	____

Advanced American Diving Service, Inc
Marine Construction and Consulting
P.O. Box 1630
415 S. McLoughlin Blvd.
Oregon City, OR 97045
503 – 650 – 8207
FAX 650-8230.

PROJECT TITLE: City of Portland BES
PROJECT DESCRIPTION: Guilds Lake Pump Station Pressure Line Rehabilitaion
AADS JOB #: 1105-528
DATE: July 11 - 31, 2005

DIVING ACTIVITY HAZARD ANALYSIS

The Dive Master has reviewed all applicable safe clearances, and reviewed them with the dive team members. The contents of this JSA, including added protective measures identified onsite, have been reviewed.

SIGNATURES OF MEETING ATTENDEES

1)	11)
2)	12)
3)	13)
4)	14)
5)	15)
6)	16)
7)	17)
8)	18)
9)	19)
10)	20)

DIVE MASTER

OWNER REPRESENTATIVE / INSPECTOR

SUBMITTAL 01450-1

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McCormick and Baxter
Sewer line Sediment Cap Completion
Construction Means and Methods

Technical Approach

The sediment cap will be constructed entirely from water-based equipment. The material will be transported to the site via barges that will then be off-loaded directly onto the capping area. Measurement of the material will be provided by scales at the material source. The specific type of scale depends on the manner with which it is placed on the barge—by conveyor or by truck.

The equipment used to place material includes a 4100 Manitowac crane barge, tugboat, 950G loader, clamshell bucket, and a material-placing skip box. Sand will be placed directly with a clamshell bucket. Gravel and 6" minus will be placed with the material skip box. The loader will load material into the skip box. Riprap will be placed with either the clamshell bucket or skip box, whichever is the more effective means as determined in the field. The labor includes a 3-man crew and superintendent. On the barge, a computer monitor will show the site that is to receive the material. Placement of each bucket or skip box of material will be guided by a GPS unit at the end of the crane boom. The real-time screen display will ensure that each bucket of material is being released in a pattern that will evenly cover the site. The density of placement will have been predetermined because the area of placement and quantity of material have been pre-determined. In this way, placement will be continuously monitored. Periodically (approximately every three days), a disk will be provided to the Engineer with the GPS data points recorded since the previous "data dump."

The capping materials will be placed sequentially. Initially, the sand will be placed. Sand will be imported by material barges until the entire quantity has been placed. Material barges will be tied along side the crane barge and replaced with full barges as they are unloaded. Coordinates of the sewerlines have been entered so that their location is known relative to material placement at all times. No anchoring or spudding will occur on the existing cap.

The subsequent materials will be placed in much the same manner. The nearshore armoring will be performed first. The gravel filter layer will be placed, followed by placement of the riprap. The 6-inch-minus rock will then be placed in the deeper water, starting from nearshore and working out towards the channel. At the end of placement activities, David Evans and Associates will perform a bathymetric survey.

Environmental Protection and Corrective Actions

According to the Erosion, Sediment, and Pollution Control Plan (ESPCP) for the city, the drop height for the material was to be minimized as much as possible to prevent bottom disturbance while producing an even cover.

In addition to abiding by the erosion control plan that was submitted to the city and as it applies to this Project, the Engineer's personnel take turbidity measurements; AAC will provide the boat and operator. The water quality parameters stated in the site's Biological Opinion require that downstream turbidity readings not exceed a 10 percent increase in background measurements or 5 nephelometric turbidity units (NTUs) over background turbidity if background is 50 NTUs or less. The ESPCP states that if water quality exceeds the established limits, the in-water work will be stopped until turbidity levels subside. If turbidity levels spike again after resuming work, the work will again be stopped and alterations to the method and pace of work will be made.

To protect against pollution from the in-water equipment, booms will surround the vessels. [confirm and indicate if they will be held away from the vessels to provide a work space and marked with flashers as indicated in the ESPCP; or, given the nature of this work, will booming strategy change?]

For other spill prevention measures, see the ESPCP submittal as these measures apply to the sediment capping project, as well. All debris generated from the construction operation will be properly disposed of off site.

Personnel

The site superintendent will be the person responsible for implementing and supervising the containment and clean-up of any oil or chemical spills, and will act in accordance with the ESPCP. The on-site supervisor will be familiar with all work activities and will ensure that the ESPCP is implemented and properly maintained.

Quality Control

The crane operator will place each material at a predetermined grid as plotted by ACC's QC engineer to achieve the correct depths. A tide board will be placed at the site and soundings will be taken to verify that the material is at the correct depth. Adjustments to the grid spacing will be made if required.

SUBMITTAL 01560-1

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E&E Transmittal Rec'd # 3

ADVANCED AMERICAN
DIVING SERVICE, INC.
415 S. McLoughlin Blvd. P.O. Box 1630
Oregon City, Oregon 97045
503-650-8207 Fax 503-650-8230

TRANSMITTAL FORM

To: Ecology and Environment, Inc.
2101 Fourth Ave., Suite 1900
Seattle, WA 98121

Ph: 206-624-9537
Fax: 206-621-9832

Attention: Susan Gardner

Date:	8/1/05	**Job No:**	1105-533
Job Name:	McCormick & Baxter Sed Cap		
Job Location:	Portland., OR		
RE:	Submittals - ESPCP		

We are sending you herewith the following items:

- ☐ Plans
- ☐ Specifications
- ☐ Prints
- ☐ Shop Drawings
- ☐ Samples
- ☐ Catalogue Cuts
- ☐ Purchase Order
- ☐ Change order
- ☐

Copies	Dated	No.	Description
~~6~~ 3	8/1/05	01560-1	Erosion, Sediment & Pollution Control Plan

These items are transmitted as checked below:

- ☒ For approval
- ☐ For your use
- ☐ As requested
- ☐ For review and comment
- ☒ Approved as submitted
- ☐ Approved as noted
- ☐ Returned for corrections
- ☒ Apply to M&B project, as applicable, as well as providing by the requirements of Section 01560.

REMARKS:

As suggested, we have used the ESPCP that was submitted for the City of Portland Pipeline Repair Project.

Copy To: _____

Signed: M. W. Nelson
Mike Nelson

Advanced American Diving Service, Inc.
Marine Construction and Consulting
P.O. Box 1630
415 S. McLoughlin Blvd.
Oregon City, OR 97045
503 - 650 - 8207
FAX 650-8230

CITY OF PORTLAND
BUREAU OF ENVIRONMENTAL SERVICES

EMERGENCY REPAIR GUILDS LAKE PUMP STATION PRESSURE LINE REHABILITATION
PROJECT #7922

EROSION, SEDIMENT, & POLLUTION CONTROL PLAN (ESPCP)

Section I – Erosion & Sedimentation Control

Section 1 – Prevention

AADS plans to implement a floating sediment curtain, of the type required by Chapter 4 - Section 7 of the City of Portland EROSION CONTROL MANUAL, around the entire work area for the duration of in-water work. The curtain will extend the full depth of the watercourse in the work area and will be anchored in place to prevent drift and encroachment on the work space.

Due to the nature of the in-water work some turbidity will be unavoidable. The sediment curtain will provide containment for the majority of the turbid water produced; even so AADS will work to minimize the production of the turbid water where ever possible. The biggest cause of turbidity on the line rehab will be the placement of aggregates. The drop height of the aggregate cover will be minimized as much as possible to prevent bottom disturbance yet still produce an even cover.

Section 2 – Inspection & Testing

AADS will conduct turbidity monitoring outside of the work area to comply with the U.S. Army Corps of Engineers Section 10/404 permit. Turbidity monitoring will be performed twice daily or more frequently as visual concerns may warrant. If the visibility of the water decreases by 10% over background, in-water work will be stopped until turbidity levels subside. The sediment curtain will be inspected for failures at this time. When work resumes turbidity will be monitored at the discretion of the onsite superintendent. If turbidity levels spike again, work will again stop, and alterations to the method and pace of work will be made.

Section II – Pollution Control

Section 1- Contamination-Prevention

As part of the contract, AADS will provide and implement an oil containment boom which will enclose the entire work area for the duration of the in-water work. The boom will encircle both the crane barge and material barge which will serve as the working platforms for the job. The boom will be appropriately anchored as needed to prevent drift and to maintain a sizable working area. Flashers will be attached at regular intervals so the boom may be clearly visible in low light and avoided by local boat traffic.

Equipment:
The following petroleum products will be used on the construction site:
- Gasoline
- Diesel
- Hydraulic Oil
- Lube Oil

- Grease

The following materials will be used on site that is potentially toxic:

- Acetylene

AADS will visually inspect all equipment prior to arrival on the job site to ensure that all oil and/or fuel leaks have been repaired, and will perform any preventative maintenance to minimize the risk of leaks. AADS, Inc. will use only approved fuel containers in amounts as needed for each day's operation. All containers holding petroleum products will be located near the center of the barge inside containment bins. All Acetylene bottles will be stored in appropriate racks and have caps secured when not in use.

AADS operations will comply with the following:
- Clean Air Act
- Solid Waste Disposal Act
- Resource Conservation and Recovery Act
- Comprehensive Environmental Response, Compensation and Liability Act
- Clean Water Act
- Marine Protection, Research, and Sanctuaries Act

Section 2 – Containment and Clean up

The site superintendent will be person responsible for implementing and supervising the containment and clean up of any oil or chemical spill.

The site superintendent will report any spills and follow up with complete documentation. All spills will be reported to the project manager and proper agencies.

Oil absorbent pads and disposal containers will be provided at the work site and located in easily accessible areas. An absorbent clean up kit will be stored on board the crane barge at all times which will include, but is not limited to:

Oil-absorbent boom, 20ft long – 4 EA
Oil-absorbent pads, 200 SF
Oil-skimming system
Oil dryall, gloves, & plastic bags
Kitty litter

In the event an oil spill occurs in the river, all construction work will be immediately stopped and all personnel on site will participate in the clean up effort, referencing the Spill Emergency Checklist. (**Section 3.1.5**). **Response phone numbers are to be posted.** With the oil containment boom already in place oil absorbent pads will be deployed to initiate the clean up. All expended pads or boom material will be placed in proper containers for disposal.

Section 3 – Sound level control

During all operations, all engine-powered equipment will meet the EMS-385-1-1 and OSHA sound level requirements with the use of properly maintained mufflers or sound barriers.

Section 3.1.2 – Coordination

Prior to on site work activities, a meeting will be held with the City of Portland Representatives to ensure the environmental plan is properly implemented and maintained. The proper lines of communication will be identified in the event that a spill occurs or any other environmental incident occurs.

Section 3.1.3 – Surveillance

During all work activities, including those of any subcontractors, (if any) the on site supervisor will be familiar with all work activities and will ensure the environmental protection plan is implemented and properly maintained. They will also be responsible to ensure all personnel and subcontractors are informed, and provided any required training to comply with this plan. Throughout the course of the work, the equipment and supplies, which are required to conform to this plan, will be inspected to ensure everything is in proper order. Any items that do not meet the standards will be repaired or replaced as required.

Section 3.1.4 – Completion

Upon completion of the project, restoration and clean up work will be done to assure that the site conditions have been left in a condition equal or better than the original condition of the site. All signs and temporary structures installed by AADS, Inc. will be removed. All debris generated from the construction operation will be disposed of off site in the proper fashion.

Section 3.1.5 – Spill Emergency Notification

Emergency Services:

A. Emergency Numbers must be posted at the job site.

B. Emergency Spill Response

a. Advanced American Diving 415 S. Mcloughlin Blvd. Oregon City, OR 97045	503-650-8207
b. Mike Johns – AADS Operations	503-793-3760
c. Tim Nelson – AADS Operations	503-849-1883
d. NRC Environmental	1-888-337-7455
e. Cowlitz Clean Sweep	1-888-423-6316

C. Agencies to Notify

a. DEQ, Northwest Region Office	503-229-5263
b. 24-Hour Number	1-800-452-0311
c. Oregon Emergency Response System	1-800-452-0311
d. City of Portland, EBS	503-823-7180
e. US Coast Guard	503-240-9300

SUBMITTAL 02145-2

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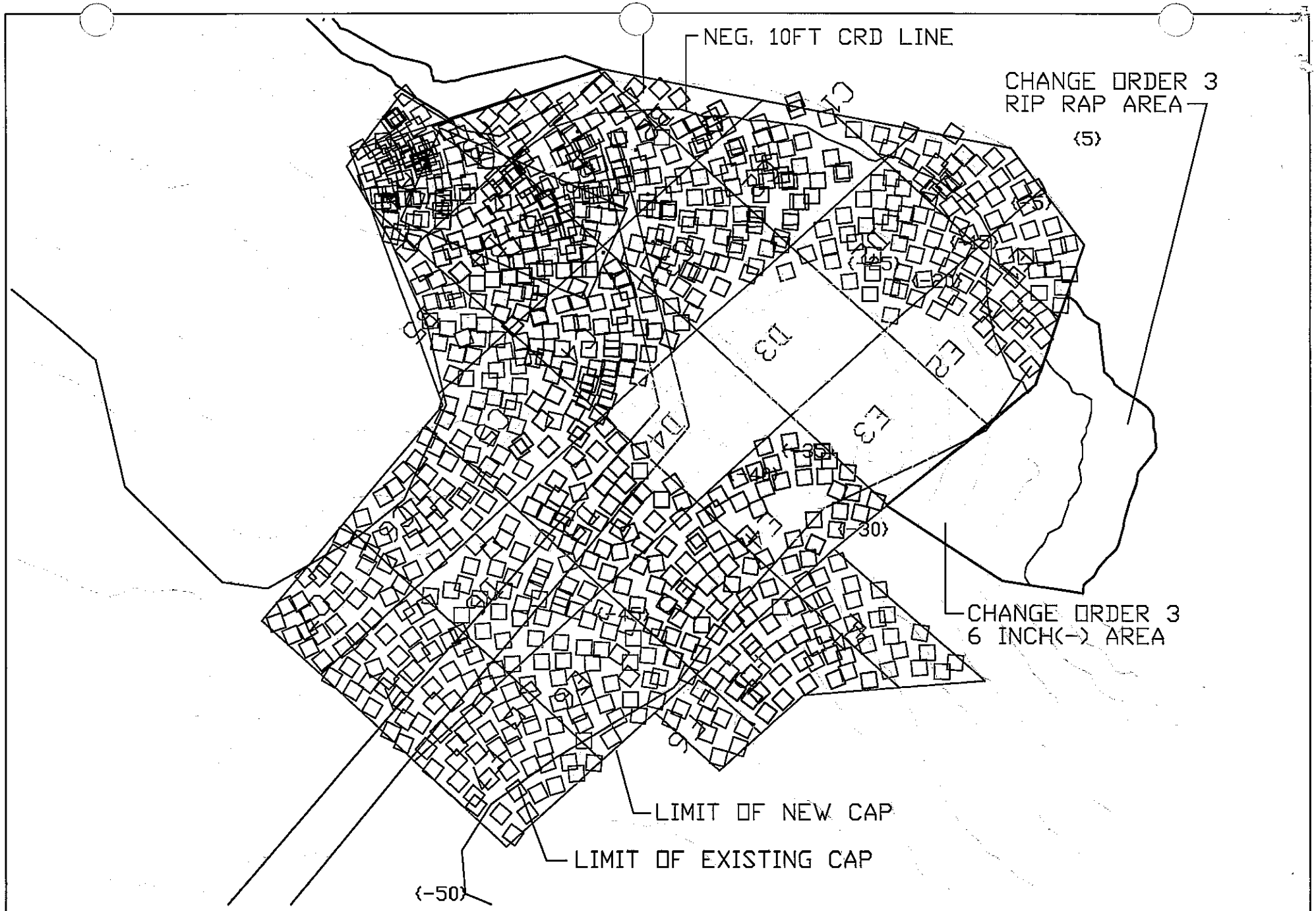


SAND BUCKETS ARE GROUPED IN COLORS BY BARGE NUMBER. SEE SUMMARY SHEETS FOR BARGE WEIGHT & CORRESPONDING COLOR.

BUCKET LOCATIONS: 2' SAND LAYER	
PROJECT: DEQ McCORMICK & BAXTER	AADS JOB# 1105-533
ADVANCED AMERICAN DIVING SERVICE, INC.	9-6-05

SAND PLACEMENT SUMMARY
DEQ McCORMICK & BAXTER
ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

CELL #	TARGET (CY)	TARGET (TN)	ESTIMATE (CY)	ESTIMATE (TN)
C2	173	234	170	230
C3	167	225	210	284
B2	71	96	69	93
B3	279	377	198	267
A3	52	70	50	68
A4	244	329	290	392
B4	349	471	338	456
C4	167	225	178	240
C5	182	246	192	259
C6	153	207	153	207
C7	129	174	116	157
B5	102	138	108	146
C1	18	24	21	28
D1	114	154	114	154
E1	79	107	78	105
D2	186	251	191	258
E2	193	261	150	203
D3	186	251	226	305
E3	197	266	214	289
D4	186	251	203	274
E4	188	254	220	297
D5	186	251	205	277
E5	186	251	192	259
F5	151	204	156	211
F4	120	162	136	184
F6	55	74	62	84
D6	186	251	191	258
E6	186	251	182	246
D7	186	251	185	250
E7	183	247	178	240
TOTAL	4854	6553	4976	6718

TOTAL TONS PURCHASED	6716 TN
TONAGE REQUIRED (NEAT)	6553 TN

BUCKET LOG & SUMMARY — PLACED: 8/31/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: SAND **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	1027	7627397.82	704604.94
2	1028	7627390.73	704595.41
3	1032	7627382.45	704589.56
4	1033	7627369.33	704578.37
5	1034	7627376.28	704582.44
6	1035	7627406.85	704607.12
7	1037	7627408.28	704597.35
8	1041	7627400.52	704594.53
9	1042	7627395.61	704586.76
10	1043	7627386.09	704582.16
11	1048	7627377.73	704573.28
12	1049	7627419.34	704595.83
13	1051	7627408.9	704588.82
14	1051	7627401.43	704581.13
15	1100	7627385.22	704566.38
16	1107	7627391.52	704577.76
17	1108	7627390.14	704574.15
18	1109	7627425.08	704587.16
19	1110	7627415.93	704580.73
20	1111	7627392.65	704557.06
21	1112	7627397.24	704568.48
22	1113	7627408.92	704574.23
23	1116	7627404.27	704560.38
24	1118	7627397.65	704552.66
25	1119	7627433.88	704581.44
26	1120	7627423.95	704577.46
27	1121	7627416.89	704569.15
28	1127	7627409.61	704568.14
29	1128	7627398.33	704561.76
30	1129	7627420.47	704590.33
31	1130	7627403.77	704588.36
32	1137	7627383.79	704576.15
33	1139	7627401.63	704603.62
34	1140	7627415.86	704593.49
35	1141	7627430.3	704575.46
36	1201	7627436.41	704564.96
37	1203	7627439.62	704572.77
38	1204	7627406.56	704550.59
39	1206	7627424.01	704564.09
40	1244	7627419.02	704538.09
41	1245	7627431	704538.97
42	1246	7627438.78	704542.4
43	1247	7627412.29	704557.12

GRID SPACES TO RECEIVE FILL

D7, E7, & E6 (BLACK BUCKETS)

AMOUNT OF MATERIAL PLACED

597 TONS via 419 BARGE (11)

AVERAGE BUCKET LOAD

597 TONS
91 BUCKETS
6.56 TON/BUCKET
4.86 CY/BUCKET

NOTES:

THIS BARGE CAME OUT OF SEQUENCE FROM THE OTHER LOADS OF SAND, HOWEVER THIS BARGE LOAD COMPLETES SAND PLACEMENT. THE TOTAL AMOUNT OF SAND PLACED IS 6716 TN.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
D7	37	5.0	185
E7	37	4.8	177.6
E6	17	4.6	78.2
TOTAL	91	4.8	440.80 CY
			595.08 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)	
C2	173	170	complete
C3	167	210	complete
B2	71	69	complete
B3	279	198	complete
A3	52	50	complete
A4	244	290	complete
B4	349	338	complete
C4	167	178	complete
C5	182	192	complete
C6	153	153	complete
C7	129	116	complete

44	1248	7627446.21	704564.08
45	1249	7627430.65	704557.22
46	1253	7627409.32	704542.61
47	1256	7627418.55	704552.08
48	1257	7627418.38	704546.01
49	1258	7627421.67	704556.86
50	1300	7627468.55	704553.73
51	1303	7627457.18	704559.52
52	1305	7627434.32	704551.03
53	1306	7627447.8	704559.78
54	1306	7627440.02	704556.35
55	1307	7627452.68	704551.13
56	1308	7627426.02	704528.77
57	1309	7627435.74	704525.46
58	1310	7627441.97	704534.41
59	1314	7627462.77	704545.38
60	1315	7627457.39	704536.41
61	1316	7627446.43	704525.77
62	1317	7627447.79	704543.97
63	1320	7627426.15	704548.83
64	1322	7627441.16	704551.45
65	1323	7627453.79	704545.02
66	1328	7627450.48	704533.56
67	1329	7627472.58	704545.11
68	1329	7627440.64	704517.42
69	1331	7627465.63	704541.05
70	1333	7627425.27	704532.44
71	1346	7627503.59	704585.59
72	1347	7627493.81	704587.07
73	1348	7627488.02	704593.92
74	1349	7627509.82	704579.33
75	1350	7627498.27	704578.44
76	1351	7627486.32	704578.77
77	1352	7627486.92	704569.63
78	1353	7627490.17	704563.47
79	1354	7627497.16	704569.35
80	1356	7627494.82	704577.32
81	1359	7627467.91	704576.85
82	1401	7627482.29	704587.39
83	1402	7627497.85	704594.26
84	1403	7627486.9	704584.23
85	1405	7627469.46	704571.34
86	1406	7627447.3	704572.56
87	1408	7627441.04	704562.4
88	1427	7627428.39	704568.22
89	1432	7627504.01	704585.57
90	1442	7627530.4	704552.01
91	1443	7627519.94	704559.6

B5	102	108	complete
C1	18	21	complete
D1	114	114	complete
E1	79	78	complete
D2	186	191	complete
E2	193	150	complete
D3	186	226	complete
E3	197	214	complete
D4	186	203	complete
E4	188	220	complete
D5	186	205	complete
E5	186	192	complete
F5	151	156	complete
F4	120	136	complete
F6	55	62	complete
D6	186	191	complete
E6	186	182	complete
D7	186	185	complete
E7	183	178	complete
TOTAL	4854	4976	

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

BUCKET LOG & SUMMARY — PLACED: 8/23/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: SAND **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	901	7627560.08	704590.7
2	903	7627558.25	704601.7
3	905	7627546	704606.29
4	906	7627525.65	704580.72
5	908	7627549.01	704591.62
6	928	7627536.13	704588.94
7	930	7627572.61	704580.63
8	931	7627559.49	704584.64
9	933	7627531.87	704558.66
10	935	7627521.74	704547.39
11	936	7627529.53	704551.43
12	939	7627523.01	704562.55
13	943	7627517.3	704556.63
14	945	7627514.77	704573.12
15	947	7627506.89	704566.04
16	949	7627503.36	704561.88
17	951	7627517.65	704569.39
18	953	7627517.06	704563.33
19	1000	7627568.69	704623.9
20	1005	7627555.25	704616.37
21	1006	7627561.7	704618.01
22	1008	7627574	704615.24
23	1009	7627559.29	704608.35
24	1011	7627562.76	704610.08
25	1013	7627585.04	704613.11
26	1015	7627574.68	704609.14
27	1016	7627565.98	704603.31
28	1019	7627574.86	704600.02
29	1019	7627584.29	704601.58
30	1020	7627588.18	704603.3
31	1023	7627575.56	704594.53
32	1025	7627601.22	704596.25
33	1028	7627589.65	704594.74
34	1030	7627580.17	704591.36
35	1105	7627614.98	704584.31
36	1109	7627600.83	704582.28
37	1116	7627588.85	704581.39
38	1121	7627603.99	704588.27
39	1122	7627592.91	704589.18
40	1125	7627609.76	704580.81
41	1137	7627439.31	704638.44
42	1140	7627432.23	704629.51
43	1142	7627423.92	704622.45

GRID SPACES TO RECEIVE FILL

D6, E6, F4, F5, & F6 (TEAL BUCKETS)

AMOUNT OF MATERIAL PLACED

731 TONS via 420 BARGE (8)

AVERAGE BUCKET LOAD

731 TONS
92 BUCKETS
7.95 TON/BUCKET
5.89 CY/BUCKET

NOTES:

FINISHED PLACING MATERIAL IN CELLS F5, THEN COMPLETED CELLS F4 & F6. THE BARGE WAS MOVED TO COMPLETE CELLS D6 & PARTIALLY COMPLETE E6.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
D6	33	5.8	191.4
E6	19	5.5	104.5
F4	22	6.2	136.4
F6	10	6.2	62
F5	8	6.1	48.8
TOTAL	92	5.9	543.10 CY
			733.19 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)	
C2	173	170	complete
C3	167	210	complete
B2	71	69	complete
B3	279	198	complete
A3	52	50	complete
A4	244	290	complete
B4	349	338	complete
C4	167	178	complete
C5	182	192	complete
C6	153	153	complete
C7	129	116	complete

44	1149	7627416.4	704612.93
45	1239	7627408.23	704610.73
46	1240	7627425.87	704630.91
47	1241	7627420.4	704603.1
48	1244	7627427.41	704609.59
49	1245	7627443.29	704627.99
50	1249	7627434.15	704621.56
51	1255	7627428.76	704596.78
52	1256	7627434.95	704604.51
53	1300	7627453.24	704632.58
54	1301	7627452.51	704621.66
55	1303	7627436.9	704612.97
56	1305	7627450.89	704609.54
57	1309	7627436.76	704592.91
58	1311	7627443.42	704601.85
59	1321	7627462.38	704623.81
60	1322	7627462.56	704614.69
61	1325	7627470.19	704612.65
62	1327	7627465.27	704604.89
63	1329	7627452.39	704602.21
64	1332	7627449.6	704593.77
65	1333	7627440.35	704583.69
66	1334	7627448.86	704613.25
67	1336	7627459.86	704609.9
68	1337	7627458.93	704606.89
69	1339	7627440.44	704617.74
70	1350	7627444.42	704607.29
71	1353	7627421.16	704615.23
72	1354	7627437.03	704633.03
73	1354	7627450.7	704618.06
74	1358	7627475.96	704605.2
75	1404	7627470.29	704601.1
76	1405	7627468.71	704590.2
77	1407	7627446.53	704575.62
78	1408	7627459.37	704592.29
79	1410	7627451.9	704584.59
80	1411	7627458.72	704568.59
81	1413	7627460.45	704584.96
82	1414	7627468.31	704560.42
83	1416	7627458.56	704578.33
84	1417	7627471.95	704584.03
85	1418	7627475.52	704589.4
86	1421	7627485.6	704598.85
87	1422	7627478.71	704596.61
88	1425	7627465.85	704564.14
89	1432	7627477.06	704568.08
90	1435	7627479.41	704575.92
91	1441	7627479.25	704554.65
92	1444	7627481.6	704562.49

B5	102	108	complete
C1	18	21	complete
D1	114	114	complete
E1	79	78	complete
D2	186	191	complete
E2	193	150	complete
D3	186	226	complete
E3	197	214	complete
D4	186	203	complete
E4	188	220	complete
D5	186	205	complete
E5	186	192	complete
F5	151	156	complete
F4	120	136	complete
F6	55	62	complete
D6	186	191	complete
E6	185	104	
TOTAL	4484	4535	

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

BUCKET LOG & SUMMARY — PLACED: 8/22/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: SAND 1.35 TN/CY

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	835	7627583.87	704647.79
2	837	7627572.65	704659.05
3	839	7627562.64	704667.23
4	840	7627549.94	704671.23
5	842	7627539.63	704669.09
6	844	7627565.52	704663.5
7	847	7627574.57	704651.09
8	849	7627520.16	704644.09
9	850	7627563.65	704657.48
10	853	7627530.07	704647.47
11	855	7627577.76	704643.1
12	856	7627568.19	704636.68
13	858	7627559.92	704630.83
14	859	7627550.31	704623.19
15	900	7627559.33	704640.57
16	901	7627569.67	704643.93
17	902	7627540.03	704652.66
18	903	7627555.52	704657.09
19	904	7627546.51	704655.52
20	906	7627554.87	704664.41
21	907	7627542.86	704662.31
22	909	7627536.38	704659.45
23	911	7627529.47	704656.6
24	912	7627521.59	704649.53
25	914	7627568.61	704651.87
26	915	7627551.44	704632.89
27	917	7627557.21	704625.43
28	918	7627539.7	704625.31
29	919	7627532.68	704634.02
30	922	7627537.25	704644.83
31	944	7627481.62	704670.7
32	946	7627477.09	704676.9
33	947	7627473.84	704667.27
34	949	7627467.66	704660.14
35	951	7627457.72	704655.56
36	953	7627464.81	704665.08
37	955	7627452.02	704650.24
38	957	7627448.05	704645.49
39	1000	7627490.7	704659.5
40	1003	7627482.2	704660.95
41	1005	7627461.18	704642.08
42	1008	7627466.56	704651.05
43	1016	7627458.98	704639.71

GRID SPACES TO RECEIVE FILL

E4, D5, E5, F5 (MAROON BUCKETS)

AMOUNT OF MATERIAL PLACED

931 TONS via ZB31 BARGE (7)

AVERAGE BUCKET LOAD

931 TONS
122 BUCKETS
7.63 TON/BUCKET
5.65 CY/BUCKET

NOTES:

PLACED ADDITIONAL BUCKETS IN E4 TO COMPLETE THE CELL. CELLS D5, & E5 WERE COMPLETED. F5 WAS PARTIALLY COMPLETED.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
E4	30	6.2	186
D5	36	5.7	205.2
E5	35	5.5	192.5
F5	21	5.1	107.1
TOTAL	122	5.7	690.80 CY
			932.68 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)
C2	173	170 complete
C3	167	210 complete
B2	71	69 complete
B3	279	198 complete
A3	52	50 complete
A4	244	290 complete
B4	349	338 complete
C4	167	178 complete
C5	182	192 complete
C6	153	153 complete
C7	129	116 complete

44	1020	7627476.45	704653.82
45	1021	7627462.16	704631.11
46	1022	7627487.79	704646.82
47	1025	7627503.79	704654.28
48	1026	7627499.35	704648.32
49	1027	7627491.32	704650.97
50	1031	7627507.44	704647.49
51	1033	7627496.56	704639.89
52	1034	7627486.61	704635.3
53	1035	7627478.07	704619.73
54	1038	7627470.95	704624.79
55	1039	7627478.81	704646.46
56	1041	7627474.36	704639.89
57	1042	7627482.57	704628.12
58	1049	7627467.81	704634.61
59	1051	7627476.19	704628.9
60	1053	7627491.63	704631.51
61	1054	7627483.33	704640.25
62	1054	7627482.81	704636.62
63	1058	7627485.02	704654.8
64	1059	7627490.92	704667.4
65	1101	7627458.4	704649.46
66	1101	7627453.93	704642.29
67	1112	7627517.1	704641.75
68	1116	7627506.83	704640.82
69	1117	7627500.98	704630.04
70	1118	7627513.45	704633.34
71	1120	7627497.15	704614.94
72	1123	7627483.9	704614.7
73	1125	7627490.54	704623.03
74	1127	7627489.67	704607.25
75	1136	7627521.1	704631.91
76	1137	7627508.92	704623.74
77	1139	7627495.84	704598.57
78	1145	7627496.96	704623.46
79	1146	7627529.56	704629.24
80	1147	7627517.88	704623.49
81	1153	7627534.5	704622.42
82	1155	7627510.6	704592.08
83	1157	7627501.21	704607.54
84	1159	7627517.21	704614.99
85	1202	7627511.82	704605.42
86	1235	7627525.54	704622.67
87	1239	7627502.99	704594.72
88	1242	7627527.04	704615.33
89	1244	7627541.51	704613.71
90	1245	7627532.88	704610.3
91	1246	7627521.21	704605.16
92	1247	7627520.94	704595.44
93	1250	7627505.75	704601.94
94	1255	7627533.08	704602.4
95	1257	7627509.06	704613.4

B5	102	108	complete
C1	18	21	complete
D1	114	114	complete
E1	79	78	complete
D2	186	191	complete
E2	193	150	complete
D3	186	226	complete
E3	197	214	complete
D4	186	203	complete
E4	188	220	complete
D5	186	205	complete
E5	186	192	complete
F5	151	107	
TOTAL	3938	3993	

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

96	1258	7627503.22	704618.42
97	1311	7627512.96	704630.92
98	1312	7627523.1	704611.79
99	1318	7627514.75	704587.71
100	1319	7627515.07	704599.25
101	1321	7627527.49	704600.73
102	1336	7627581.06	704577.35
103	1339	7627567.83	704577.72
104	1341	7627556.67	704575.6
105	1342	7627547.12	704569.79
106	1343	7627540.57	704564.5
107	1346	7627566.4	704587.49
108	1349	7627554.79	704584.77
109	1350	7627546.11	704579.54
110	1352	7627537.8	704572.48
111	1353	7627534.75	704570.13
112	1355	7627563.2	704595.48
113	1357	7627553.8	704595.13
114	1359	7627544.23	704588.71
115	1400	7627534.58	704579.25
116	1402	7627528.44	704573.34
117	1403	7627519.6	704577.85
118	1405	7627525.84	704587.4
119	1407	7627551.99	704606.73
120	1412	7627541.98	704599.72
121	1413	7627534.49	704591.41
122	1416	7627571.93	704586.73

BUCKET LOG & SUMMARY — PLACED: 8/18/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: SAND 1.35 TN/CY

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	809	7627590.07	704732.73
2	817	7627598.16	704716.7
3	819	7627605.28	704711.64
4	821	7627610.18	704703.6
5	822	7627616.87	704713.75
6	825	7627607.73	704723.12
7	826	7627612.61	704729.67
8	828	7627618.29	704734.38
9	830	7627615.48	704725.34
10	832	7627621.91	704741.57
11	833	7627629.49	704737.72
12	835	7627625.03	704731.15
13	839	7627624.38	704707.46
14	841	7627625.22	704722.64
15	844	7627637.3	704727.16
16	845	7627634.1	704719.35
17	848	7627631	704699.98
18	855	7627626.34	704716.53
19	857	7627650.77	704720.1
20	900	7627595.57	704761.76
21	906	7627585.73	704760.82
22	911	7627572.73	704753.88
23	914	7627616.78	704756.91
24	916	7627638.43	704736.86
25	918	7627644.13	704726.97
26	1044	7627624.71	704688.61
27	1044	7627624.71	704688.61
28	1045	7627630.37	704692.7
29	1047	7627644.68	704700.82
30	1048	7627638.45	704707.07
31	1049	7627631.27	704709.7
32	1050	7627613.8	704695.6
33	1052	7627621.65	704701.46
34	1055	7627649.27	704712.24
35	1057	7627642.66	704720.33
36	1100	7627641.69	704716.1
37	1101	7627629.11	704724.35
38	1101	7627548.4	704738.75
39	1106	7627563.71	704736.5
40	1108	7627555.5	704733.08
41	1110	7627545.28	704733.98
42	1114	7627532.71	704727.03
43	1114	7627537.04	704729.34

GRID SPACES TO RECEIVE FILL

D2, E2, D3, E3, & E4 (YELLOW BUCKETS)

AMOUNT OF MATERIAL PLACED

210 TONS REMAINING via 420 BARGE (5)
941 TONS via ZB31 (6)

AVERAGE BUCKET LOAD

1151 TONS
160 BUCKETS
7.19 TON/BUCKET
5.33 CY/BUCKET

NOTES:

Cells D2 was completed & E2 was partially completed with the remaining material from the 420 Barge. E2 was then completed with 10 buckets (~75 tons) from the ZB31 Barge. Cells D3, E3, D4 were completed with the remaining material being placed in E4. Note: 10 buckets in cell E2 should be yellow because they cam from the ZB 31 Brarge, the bucket color had not been changed.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
D2	5	5.0	25
E2	31	4.9	150.35
D3	41	5.5	225.5
E3	39	5.5	214.5
D4	37	5.5	203.5
E4	7	4.8	33.6
TOTAL	160	5.3	852.45 CY
			1150.81 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)	
C2	173	170	complete
C3	167	210	complete
B2	71	69	complete
B3	279	198	complete
A3	52	50	complete
A4	244	290	complete
B4	349	338	complete
C4	167	178	complete
C5	182	192	complete
C6	153	153	complete
C7	129	116	complete

44	1118	7627570.31	704728.42
45	1119	7627560.84	704725.64
46	1121	7627552.72	704725.26
47	1123	7627545.52	704727.28
48	1125	7627527.83	704720.48
49	1127	7627520.42	704715.21
50	1128	7627585.79	704717.04
51	1130	7627572.67	704721.06
52	1131	7627570.18	704708.36
53	1132	7627621.07	704680.8
54	1134	7627575.65	704689.97
55	1135	7627553.38	704687.55
56	1136	7627544.98	704692.65
57	1138	7627562.2	704697.64
58	1140	7627555.77	704696.6
59	1140	7627536.21	704699.58
60	1141	7627544.93	704706.02
61	1141	7627555.73	704710.58
62	1145	7627529.11	704705.24
63	1145	7627533.09	704710
64	1145	7627539.65	704715.89
65	1150	7627574.16	704713.11
66	1150	7627560.62	704717.74
67	1151	7627608.14	704691.5
68	1152	7627596.33	704696.69
69	1155	7627586.34	704706.09
70	1157	7627578.84	704697.18
71	1158	7627610	704681.72
72	1159	7627589.43	704694.45
73	1200	7627600.03	704691.72
74	1202	7627596.96	704703.97
75	1233	7627606.69	704670.26
76	1235	7627611.55	704676.21
77	1237	7627595.79	704677.25
78	1238	7627602.19	704661.88
79	1242	7627583.02	704678.82
80	1245	7627566.73	704676.24
81	1246	7627589.9	704665.26
82	1248	7627578.68	704660.71
83	1250	7627596.02	704654.75
84	1252	7627587.93	704655.58
85	1253	7627569.07	704668.27
86	1255	7627581.49	704669.75
87	1256	7627555.67	704677.76
88	1259	7627563.93	704683
89	1301	7627572.94	704684.57
90	1302	7627601.04	704681.97
91	1304	7627589.2	704685.95
92	1306	7627588.11	704677.46
93	1307	7627600.24	704668.62
94	1309	7627572.17	704672.44
95	1310	7627595.98	704668.74

B5	102	108	complete
C1	18	21	complete
D1	114	114	complete
E1	79	78	complete
D2	186	191	complete
E2	193	150	complete
D3	186	226	complete
E3	197	214	complete
D4	186	203	complete
E4	188	34	
Total	3415	3303	

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

96	1311	7627576.32	704683.26
97	1313	7627556.3	704700.23
98	1315	7627564.38	704714.6
99	1317	7627549.43	704714.41
100	1319	7627529.72	704711.92
101	1321	7627547.04	704720.55
102	1321	7627537.62	704719.6
103	1331	7627592.16	704700.45
104	1331	7627583.85	704693.39
105	1333	7627553.14	704694.24
106	1333	7627546.01	704698.7
107	1335	7627565.78	704703.62
108	1337	7627560.25	704704.38
109	1337	7627552.1	704702.78
110	1338	7627617.81	704686.37
111	1340	7627605.56	704675.76
112	1341	7627577.48	704678.98
113	1342	7627586.23	704671.44
114	1400	7627492.32	704671.62
115	1402	7627542.21	704684.82
116	1403	7627533.15	704681.42
117	1405	7627525.73	704675.55
118	1407	7627513.76	704675.28
119	1408	7627506.46	704673.65
120	1409	7627516.59	704684.92
121	1410	7627529.49	704688.21
122	1411	7627504.89	704678.56
123	1412	7627521.47	704691.47
124	1414	7627483.97	704678.53
125	1416	7627491.03	704686.85
126	1429	7627509.46	704689.38
127	1429	7627497.74	704682.41
128	1430	7627502.19	704688.97
129	1432	7627513.4	704708.11
130	1433	7627507.72	704703.41
131	1434	7627515.82	704703.18
132	1436	7627522.02	704695.72
133	1438	7627497.34	704698.83
134	1448	7627486.22	704682.73
135	1450	7627537.69	704675.83
136	1453	7627509.86	704657.75
137	1455	7627525.07	704682.86
138	1457	7627528.94	704668.17
139	1457	7627519.4	704662.96
140	1458	7627497.64	704663.56
141	1502	7627521.56	704679.31
142	1503	7627515.68	704667.32
143	1504	7627507.54	704666.33
144	1509	7627525.14	704685.29
145	1516	7627509.27	704697.89
146	1516	7627513.78	704691.08
147	1518	7627532.24	704694.82

148	1522	7627570.19	704693.16
149	1522	7627525.08	704667.67
150	1524	7627539.7	704686.71
151	1527	7627493.79	704694.07
152	1532	7627542.08	704710.96
153	1534	7627550.8	704717.41
154	1544	7627552.33	704649.89
155	1545	7627542.35	704644.08
156	1547	7627528.6	704640.82
157	1550	7627560.82	704647.83
158	1552	7627540.75	704632.58
159	1555	7627553.67	704636.48
160	1600	7627549.98	704642.05

BUCKET LOG & SUMMARY — PLACED: 8/17/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: SAND **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	951	7627646.66	704771.89
2	953	7627639.2	704780
3	1252	7627659.81	704738.09
4	1255	7627655.42	704749.15
5	1257	7627653.08	704757.12
6	1258	7627656.47	704725.42
7	1301	7627659.72	704750.25
8	1304	7627650.18	704745.04
9	1310	7627657.1	704732.69
10	1312	7627614.38	704793.46
11	1314	7627648.07	704730.51
12	1315	7627642.93	704745.25
13	1317	7627630.34	704783.89
14	1319	7627644.5	704755.54
15	1321	7627575.16	704795.15
16	1323	7627596.89	704793.94
17	1325	7627589.03	704787.47
18	1326	7627585.77	704793.04
19	1327	7627634.82	704745.47
20	1328	7627635.5	704754.57
21	1329	7627647.04	704739.66
22	1331	7627643.49	704765.29
23	1335	7627630.52	704759.57
24	1337	7627620.54	704753.77
25	1338	7627613.16	704764.92
26	1339	7627602.8	704776.15
27	1342	7627630.77	704768.68
28	1344	7627623.57	704770.71
29	1345	7627614.05	704781.31
30	1348	7627597.03	704783.6
31	1349	7627620.02	704765.94
32	1350	7627632.68	704775.93
33	1351	7627618.41	704784.83
34	1351	7627623.43	704781.05
35	1355	7627615.14	704774.59
36	1357	7627606.11	704787.61
37	1358	7627641.1	704771.44
38	1401	7627611.68	704772.86
39	1403	7627608.07	704781.47
40	1406	7627605.65	704771.21
41	1410	7627653.46	704740.09
42	1429	7627584.82	704774.22
43	1430	7627594.58	704772.12

GRID SPACES TO RECEIVE FILL

C1, D1, E1, & D2 (MAROON BUCKETS)

AMOUNT OF MATERIAL PLACED

511 TONS OF THE 721 TONS via 420 BARGE (5)

AVERAGE BUCKET LOAD

511 TONS
73 BUCKETS
7.00 TON/BUCKET
5.19 CY/BUCKET

NOTES:

Cells C1, D1, & E2 were completed. The 420 barge was not completely cleared before work finished for the day. Approximately 210 TN remained on the barge.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
C1	4	5.2	20.8
D1	22	5.2	114.4
E1	15	5.2	78
D2	32	5.2	166.4
TOTAL	73	5.2	379.6 CY
			512.45 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)	
C2	173	170	complete
C3	167	210	complete
B2	71	69	complete
B3	279	198	complete
A3	52	50	complete
A4	244	290	complete
B4	349	338	complete
C4	167	178	complete
C5	182	192	complete
C6	153	153	complete
C7	129	116	complete
B5	102	108	complete
C1	18	21	complete
D1	114	114	complete
E1	79	78	complete

44	1434	7627604.68	704766.98
45	1436	7627579.09	704767.69
46	1437	7627591	704766.14
47	1439	7627609.16	704758.95
48	1441	7627601.12	704761.6
49	1443	7627589.99	704775.9
50	1448	7627617.83	704748.37
51	1449	7627556.71	704745.82
52	1451	7627562.97	704755.98
53	1453	7627602.97	704736.02
54	1454	7627589.75	704721.19
55	1455	7627599.76	704728.21
56	1500	7627581.45	704729.93
57	1501	7627593.02	704731.43
58	1502	7627573.48	704735.02
59	1504	7627566.45	704743.11
60	1506	7627612.49	704740.62
61	1508	7627594.51	704738.69
62	1509	7627582.54	704738.41
63	1510	7627609.19	704744.97
64	1512	7627582.75	704745.7
65	1513	7627565.32	704748.62
66	1515	7627571.22	704761.22
67	1516	7627575.63	704750.76
68	1518	7627580.08	704757.33
69	1522	7627589.5	704758.28
70	1524	7627596.67	704755.04
71	1527	7627593.12	704750.28
72	1529	7627606.39	704751.73
73	1530	7627599.4	704745.85

D2	186	166
TOTAL	2465	2451

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

BUCKET LOG & SUMMARY — PLACED: 8/15/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: SAND **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	731	7627422.13	704696.06
2	731	7627415.44	704685.91
3	732	7627430.98	704661.16
4	735	7627420.17	704671.80
5	736	7627431.31	704673.31
6	737	7627434.17	704699.37
7	741	7627443.88	704710.65
8	742	7627437.36	704706.58
9	743	7627433.44	704688.45
10	744	7627427.01	704687.41
11	746	7627442.10	704677.27
12	748	7627437.62	704654.29
13	749	7627444.61	704660.17
14	751	7627443.39	704693.04
15	752	7627440.58	704684.00
16	754	7627424.71	704681.40
17	757	7627431.50	704695.19
18	800	7627444.56	704704.55
19	800	7627442.76	704700.96
20	802	7627424.29	704666.21
21	803	7627435.80	704665.89
22	804	7627413.99	704679.87
23	810	7627457.10	704679.28
24	811	7627438.95	704687.08
25	823	7627434.51	704711.52
26	824	7627418.56	704705.89
27	825	7627417.47	704697.40
28	826	7627414.99	704715.71
29	829	7627424.94	704705.10
30	829	7627423.18	704718.52
31	831	7627398.79	704747.17
32	832	7627405.39	704739.08
33	835	7627416.69	704730.86
34	836	7627404.39	704733.64
35	840	7627414.03	704727.29
36	841	7627411.85	704710.33
37	842	7627421.29	704711.89
38	846	7627426.83	704711.73
39	848	7627418.72	704727.16
40	849	7627408.89	704726.82
41	850	7627408.25	704718.94
42	850	7627429.54	704717.13
43	853	7627410.85	704735.89

GRID SPACES TO RECEIVE FILL

B5, C5, C6, & C7 (TEAL BLUE BUCKETS)

AMOUNT OF MATERIAL PLACED

685 TONS via 420 BARGE (4)

AVERAGE BUCKET LOAD

685 TONS
113 BUCKETS
6.06 TON/BUCKET
4.49 CY/BUCKET

NOTES:

Cells B5, C5, C6, & C7 were all completed. The cells required a total of 762 tons, 80 tons of which was placed on Friday the 12th, leaving 682 tons which was covered by the 685 ton barge.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
B5	22	4.9	107.8
C5	28	4.7	130.2
C6	34	4.5	153
C7	29	4.0	116
TOTAL	113	4.5	507 CY
			684.45 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)	
C2	173	170	complete
C3	167	210	complete
B2	71	69	complete
B3	279	198	complete
A3	52	50	complete
A4	244	290	complete
B4	349	338	complete
C4	167	178	complete
C5	182	192	complete
C6	153	153	complete
C7	129	116	complete
B5	102	108	complete
TOTAL	2068	2072	

44	906	7627381.33	704641.26
45	911	7627389.23	704633.75
46	913	7627394.56	704625.70
47	914	7627401.25	704620.65
48	916	7627410.75	704624.64
49	917	7627416.53	704632.99
50	919	7627424.43	704640.67
51	920	7627430.16	704647.20
52	922	7627431.23	704655.08
53	923	7627401.59	704632.80
54	926	7627424.08	704658.92
55	929	7627415.24	704663.42
56	933	7627410.70	704669.02
57	935	7627406.97	704672.77
58	938	7627402.87	704663.77
59	939	7627397.62	704659.05
60	941	7627389.67	704649.54
61	942	7627394.04	704653.07
62	944	7627406.99	704658.18
63	945	7627413.66	704652.52
64	947	7627423.01	704651.05
65	950	7627410.76	704640.45
66	953	7627412.60	704645.26
67	954	7627399.77	704644.40
68	954	7627404.26	704652.18
69	956	7627400.87	704637.68
70	958	7627419.96	704648.70
71	1000	7627408.03	704634.44
72	1001	7627406.63	704645.42
73	1012	7627347.68	704597.82
74	1013	7627354.75	704606.74
75	1014	7627361.41	704615.68
76	1020	7627355.65	704592.74
77	1022	7627366.39	704625.87
78	1023	7627373.77	704630.53
79	1024	7627363.94	704583.99
80	1026	7627368.82	704590.55
81	1027	7627377.57	704598.21
82	1029	7627360.11	704599.91
83	1030	7627363.41	704595.56
84	1031	7627384.92	704601.65
85	1033	7627395.99	704615.93
86	1131	7627347.32	704600.26
87	1131	7627356.51	704608.52
88	1131	7627364.48	704618.63
89	1131	7627370.69	704626.97
90	1131	7627373.86	704633.57
91	1132	7627353.58	704595.23
92	1132	7627360.27	704590.18
93	1132	7627365.68	704585.16
94	1132	7627373.94	704590.40
95	1132	7627379.21	704595.73

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

96	1133	7627385.35	704601.64
97	1133	7627392.00	704610.57
98	1133	7627396.83	704615.30
99	1133	7627391.08	704623.36
100	1134	7627384.37	704627.81
101	1134	7627380.67	704632.77
102	1134	7627367.14	704622.21
103	1134	7627358.91	704618.18
104	1135	7627351.34	704606.84
105	1137	7627360.23	704604.16
106	1139	7627359.62	704597.49
107	1140	7627370.78	704599.61
108	1141	7627379.17	704609.71
109	1142	7627370.18	704608.75
110	1143	7627373.37	704615.95
111	1143	7627382.96	704622.98
112	1143	7627385.26	704613.80
113	1202	7627364.69	704595.52

BUCKET LOG & SUMMARY — PLACED: 8/12/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: SAND 1.35 TN/CY

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	800	7627460.90	704739.36
2	801	7627455.51	704744.98
3	802	7627453.24	704740.18
4	804	7627466.26	704732.52
5	806	7627471.15	704739.68
6	808	7627470.47	704745.78
7	810	7627460.77	704765.50
8	811	7627464.94	704746.54
9	813	7627466.00	704753.81
10	818	7627441.50	704778.81
11	819	7627445.16	704772.02
12	821	7627453.57	704767.53
13	823	7627462.02	704749.06
14	825	7627461.10	704761.85
15	826	7627462.21	704755.74
16	827	7627433.74	704775.98
17	829	7627450.22	704739.05
18	830	7627457.91	704754.64
19	831	7627456.34	704759.55
20	833	7627451.85	704751.77
21	834	7627448.66	704759.76
22	836	7627454.14	704757.18
23	836	7627445.89	704767.74
24	839	7627436.63	704772.25
25	840	7627436.88	704766.17
26	840	7627442.31	704761.76
27	840	7627441.27	704755.10
28	844	7627447.83	704745.19
29	845	7627446.68	704750.09
30	847	7627453.26	704771.79
31	849	7627466.46	704739.81
32	850	7627454.42	704767.50
33	851	7627444.61	704782.98
34	855	7627448.93	704769.48
35	856	7627440.57	704775.79
36	858	7627440.19	704777.63
37	859	7627446.48	704758.00
38	900	7627432.33	704771.16
39	901	7627442.21	704742.92
40	903	7627433.03	704765.67
41	904	7627439.81	704748.46
42	907	7627451.76	704732.93
43	909	7627450.72	704726.27

GRID SPACES TO RECEIVE FILL

B4, C4, & B5 (NAVY BLUE BUCKETS)

AMOUNT OF MATERIAL PLACED

780 TONS via ZB 31 (3)

AVERAGE BUCKET LOAD

780 TONS
121 BUCKETS
6.45 TON/BUCKET
4.78 CY/BUCKET

NOTES:

Cells B4 & C4 were completed, with approximately 80 tons remaining to be placed in cell C5. The last of the barge material was placed in cell C4, hence the low average bucket size.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
B4	65	5.2	338
C4	43	4.2	178.45
B5	13	4.8	61.75
TOTAL	121	4.8	578.2 CY
			780.57 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)	
C2	173	170	complete
C3	167	210	complete
B2	71	69	complete
B3	279	198	complete
A3	52	50	complete
A4	244	290	complete
B4	349	338	complete
C4	167	178	complete
C5	182	62	
TOTAL	1684	1565	

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

44	910	7627444.20	704722.19
45	912	7627447.42	704730.62
46	914	7627445.05	704737.37
47	929	7627442.29	704730.15
48	929	7627439.49	704736.92
49	935	7627435.33	704756.48
50	936	7627440.64	704716.82
51	937	7627437.93	704742.43
52	937	7627431.79	704751.72
53	947	7627435.82	704727.90
54	949	7627436.08	704721.81
55	950	7627432.63	704735.89
56	952	7627429.91	704760.89
57	958	7627427.32	704744.55
58	959	7627422.21	704760.50
59	1000	7627425.32	704749.47
60	1004	7627418.54	704751.48
61	1005	7627410.87	704751.69
62	1006	7627419.90	704738.68
63	1007	7627426.60	704734.23
64	1009	7627416.72	704747.28
65	1010	7627412.80	704744.34
66	1012	7627426.83	704726.93
67	1029	7627486.45	704706.43
68	1030	7627485.41	704699.77
69	1032	7627485.05	704717.41
70	1033	7627485.85	704730.76
71	1035	7627480.56	704740.03
72	1037	7627496.50	704714.66
73	1039	7627507.27	704718.01
74	1041	7627494.25	704725.67
75	1043	7627494.12	704705.61
76	1045	7627477.82	704687.82
77	1047	7627671.15	704700.69
78	1129	7627475.63	704716.46
79	1129	7627473.77	704726.24
80	1131	7627483.19	704727.19
81	1132	7627478.59	704699.96
82	1134	7627479.66	704707.83
83	1136	7627477.50	704691.48
84	1137	7627469.97	704697.16
85	1138	7627470.69	704707.48
86	1139	7627467.99	704717.89
87	1140	7627466.53	704727.05
88	1141	7627462.35	704699.20
89	1143	7627460.08	704725.40
90	1144	7627463.29	704718.02
91	1145	7627460.02	704707.77
92	1146	7627455.52	704714.59
93	1147	7627450.99	704720.79
94	1148	7627450.97	704720.18
95	1149	7627449.80	704708.66

96	1153	7627502.39	704711.46
97	1155	7627503.19	704724.81
98	1201	7627482.58	704720.52
99	1203	7627483.42	704735.69
100	1205	7627477.86	704735.24
101	1207	7627490.99	704716.03
102	1209	7627454.68	704669.01
103	1211	7627452.40	704679.41
104	1212	7627444.47	704670.51
105	1213	7627457.38	704689.61
106	1215	7627466.40	704675.98
107	1217	7627474.67	704681.83
108	1219	7627465.32	704683.31
109	1221	7627470.74	704694.10
110	1221	7627468.52	704691.12
111	1224	7627456.32	704697.54
112	1226	7627449.62	704686.78
113	1229	7627453.10	704704.32
114	1231	7627443.12	704668.12
115	1232	7627448.81	704703.83
116	1234	7627473.47	704700.10
117	1236	7627490.45	704696.59
118	1240	7627479.75	704710.87
119	1244	7627478.49	704696.32
120	1245	7627469.28	704687.45
121	1246	7627466.74	704672.93

BUCKET LOG & SUMMARY

Placed: 8/10/2005

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

Material: SAND 1.35 TN/CY

Bucket #	Time	Bucket Center Point X	Y
1	726	7627502.46	704744.89
2	728	7627504.11	704773.42
3	729	7627494.04	704733.58
4	731	7627496.71	704752.96
5	733	7627499.26	704737.08
6	734	7627508.13	704748.99
7	737	7627493.67	704766.41
8	738	7627499.50	704791.78
9	740	7627493.37	704786.48
10	741	7627491.15	704798.70
11	743	7627482.93	704779.48
12	747	7627482.67	704800.76
13	749	7627485.75	704773.32
14	751	7627476.63	704813.70
15	753	7627462.17	704784.92
16	757	7627501.67	704762.54
17	800	7627510.50	704757.44
18	802	7627471.82	704809.58
19	808	7627511.65	704722.14
20	810	7627530.48	704754.45
21	811	7627530.68	704761.74
22	812	7627527.56	704772.16
23	814	7627527.98	704787.35
24	816	7627524.80	704795.95
25	818	7627546.57	704749.75
26	819	7627539.20	704791.90
27	822	7627521.80	704780.22
28	828	7627550.29	704760.59
29	831	7627536.18	704759.76
30	835	7627520.20	704768.72
31	836	7627519.27	704796.71
32	837	7627536.51	704740.91
33	839	7627528.21	704749.65
34	843	7627546.21	704752.19
35	853	7627443.65	704794.55
36	855	7627435.05	704792.36
37	857	7627443.02	704787.28
38	859	7627449.23	704780.42
39	901	7627455.04	704774.17
40	903	7627457.20	704790.53
41	905	7627452.08	704805.87
42	907	7627462.31	704805.58
43	908	7627456.19	704800.28
44	910	7627441.85	704806.76

GRID SPACES TO RECEIVE FILL

C2, C3, B2, B3, A3, & A4

AMOUNT OF MATERIAL PLACED

700 TONS via ZB 31 (2)

AVERAGE BUCKET LOAD

700 TON
116 BUCKETS
6.03 TON/BUCKET
4.47 CY/BUCKET

NOTES:

Of the 700 tons on the barge 300 tons were divided into cells C2, C3, B2, & B3. The remaining 400 tons were placed solely in cells A3 & A4.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
C2	5	5.0	25.0
C3	16	5.0	80.0
B2	2	5.0	10.0
B3	13	5.0	65.0
A3	11	4.5	49.5
A4	69	4.2	289.8
TOTAL	116	4.5	519.3 CY
			701.1 TN

ESTIMATED QUANTITY TO DATE

	TARGET (CY)	ESTIMATE (CY)
C2	173	170
C3	167	210
B2	71	69
B3	279	198
A3	52	50
A4	244	290
TOTAL	**986**	**987**

Bucket size values (CY/Bucket) are not based on any tangable data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonage, but may not be the only combination of bucket sizes to do so.

BUCKET LOG & SUMMARY

Placed: 8/10/2005

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

Material: SAND 1.35 TN/CY

Bucket #	Time	Bucket Center Point X	Y
45	911	7627439.14	704801.37
46	916	7627474.44	704780.93
47	919	7627430.99	704799.77
48	939	7627429.76	704786.43
49	940	7627430.09	704782.77
50	942	7627415.48	704794.73
51	944	7627398.36	704808.58
52	945	7627409.49	704779.09
53	946	7627410.18	704772.99
54	949	7627423.45	704774.44
55	950	7627424.58	704784.14
56	951	7627419.69	704792.79
57	953	7627418.45	704778.84
58	954	7627412.47	704763.20
59	955	7627404.69	704759.77
60	957	7627404.56	704801.11
61	958	7627393.84	704799.58
62	959	7627408.11	704790.68
63	1003	7627417.34	704784.95
64	1005	7627402.71	704796.30
65	1006	7627404.89	704782.26
66	1007	7627405.45	704787.10
67	1008	7627396.79	704798.29
68	1009	7627401.49	704767.76
69	1013	7627422.87	704768.99
70	1015	7627392.94	704797.79
71	1016	7627398.13	704784.88
72	1017	7627398.30	704775.75
73	1018	7627394.87	704790.44
74	1020	7627392.73	704759.49
75	1022	7627392.47	704765.58
76	1024	7627390.52	704772.32
77	1025	7627385.14	704778.55
78	1026	7627389.75	704790.58
79	1028	7627394.30	704785.59
80	1029	7627398.25	704789.13
81	1030	7627413.40	704766.21
82	1032	7627410.00	704782.11
83	1033	7627420.77	704770.26
84	1035	7627405.24	704779.81
85	1036	7627394.09	704777.69
86	1037	7627385.40	704787.66
87	1038	7627401.67	704758.64
88	1040	7627410.42	704766.30

BUCKET LOG & SUMMARY

Placed: 8/10/2005

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

Material: SAND 1.35 TN/CY

Bucket #	Time	Bucket Center Point X	Y
89	1041	7627415.91	704764.32
90	1044	7627413.21	704774.73
91	1045	7627402.35	704767.74
92	1046	7627390.77	704781.43
93	1047	7627383.34	704774.95
94	1049	7627380.69	704787.18
95	1051	7627389.52	704766.88
96	1052	7627396.43	704754.53
97	1133	7627392.98	704753.41
98	1136	7627401.02	704750.75
99	1137	7627404.51	704768.89
100	1138	7627413.46	704768.04
101	1140	7627394.69	704799.56
102	1143	7627404.85	704781.04
103	1144	7627404.05	704782.89
104	1148	7627400.24	704784.21
105	1151	7627403.36	704788.99
106	1154	7627413.20	704758.92
107	1156	7627407.05	704783.41
108	1157	7627407.56	704786.44
109	1200	7627400.23	704783.60
110	1204	7627392.89	704780.77
111	1205	7627392.06	704766.20
112	1206	7627397.65	704767.87
113	1209	7627392.59	704769.83
114	1210	7627389.17	704785.12
115	1211	7627390.99	704789.33
116	1214	7627387.88	704769.35

BUCKET LOG & SUMMARY

Placed: 8/9/2005

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

Material: SAND 1.35 TN/CY

Bucket #	Time	Bucket Center Point X	Y
1	859	7627548.56	704775.22
2	901	7627554.30	704766.55
3	901	7627554.30	704766.55
4	903	7627554.95	704790.24
5	905	7627553.83	704780.55
6	907	7627548.47	704787.38
7	909	7627542.35	704782.08
8	910	7627537.65	704782.21
9	912	7627538.58	704769.42
10	914	7627558.63	704768.86
11	915	7627560.93	704774.88
12	918	7627566.30	704783.85
13	920	7627570.40	704777.66
14	922	7627571.29	704778.85
15	924	7627564.61	704799.70
16	926	7627551.98	704806.13
17	928	7627552.32	704803.08
18	930	7627545.65	704793.54
19	931	7627538.08	704797.40
20	933	7627539.04	704785.82
21	935	7627529.29	704788.53
22	944	7627553.02	704766.59
23	946	7627549.82	704774.58
24	947	7627550.24	704758.76
25	949	7627540.86	704774.83
26	951	7627536.21	704776.17
27	953	7627546.48	704777.11
28	955	7627529.17	704784.27
29	957	7627526.02	704778.28
30	958	7627523.18	704752.83
31	959	7627509.99	704739.21
32	1000	7627515.70	704760.33
33	1002	7627512.41	704749.48
34	1003	7627514.43	704776.17
35	1004	7627512.51	704768.32
36	1005	7627510.83	704738.58
37	1007	7627506.82	704732.61
38	1008	7627509.28	704759.90
39	1010	7627500.58	704754.06
40	1011	7627499.12	704747.42
41	1012	7627495.13	704742.06
42	1013	7627513.81	704738.50
43	1015	7627518.21	704743.24
44	1016	7627522.46	704742.51

GRID SPACES TO RECEIVE FILL

C2, C3, B2, & B3

AMOUNT OF MATERIAL PLACED

630 TONS via 420 BARGE (1)

AVERAGE BUCKET LOAD

630 TON
107 BUCKETS
5.89 TON/BUCKET
4.36 CY/BUCKET

NOTES:

The four grid cells are scheduled to receive 932 tons of sand between cells C2, C3, B4, & B5. 630 tons were placed leaving the cells 302 tons deficiant.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
C2	29	5.0	145.0
C3	29	4.5	130.5
B2	13	4.5	58.5
B3	36	3.7	133.2
TOTAL	107	4.4	467.2 CY
			630.7 TN

ESTIMATED QUANTITY TO DATE

	TARGET (CY)	ESTIMATE (CY)
C2	173	145.0
C3	167	130.0
B2	71	59.0
B3	279	133.0

Bucket size values (CY/Bucket) are not based on any tangable data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonage, but may not be the only combination of bucket sizes to do so.

BUCKET LOG & SUMMARY

Placed: 8/9/2005

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

Material: SAND 1.35 TN/CY

Bucket #	Time	Bucket Center Point X	Y
45	1018	7627512.67	704728.19
46	1019	7627522.62	704732.78
47	1021	7627540.98	704748.08
48	1022	7627533.86	704737.94
49	1023	7627536.11	704757.33
50	1025	7627523.17	704768.03
51	1027	7627529.00	704747.19
52	1029	7627537.08	704761.56
53	1032	7627522.10	704760.15
54	1034	7627508.05	704776.96
55	1037	7627503.15	704785.00
56	1039	7627500.15	704769.27
57	1040	7627502.13	704763.75
58	1044	7627521.57	704802.72
59	1046	7627520.14	704797.29
60	1047	7627511.61	704797.53
61	1048	7627506.34	704807.40
62	1051	7627497.58	704799.74
63	1055	7627515.23	704789.52
64	1131	7627498.76	704811.26
65	1132	7627488.95	704811.53
66	1135	7627506.85	704795.23
67	1137	7627519.36	704799.74
68	1138	7627513.90	704787.74
69	1142	7627515.33	704793.17
70	1148	7627490.66	704781.09
71	1149	7627484.15	704777.01
72	1151	7627472.61	704791.92
73	1157	7627471.45	704781.01
74	1159	7627469.64	704777.42
75	1202	7627486.27	704807.35
76	1204	7627493.15	704793.79
77	1205	7627479.38	704805.11
78	1207	7627481.71	704766.14
79	1208	7627478.57	704760.75
80	1210	7627481.99	704791.66
81	1211	7627472.81	704799.21
82	1215	7627469.96	704788.96
83	1216	7627460.80	704797.12
84	1217	7627465.53	704783.00
85	1219	7627467.97	704763.48
86	1220	7627468.27	704789.61
87	1223	7627482.40	704791.04
88	1224	7627491.38	704776.20

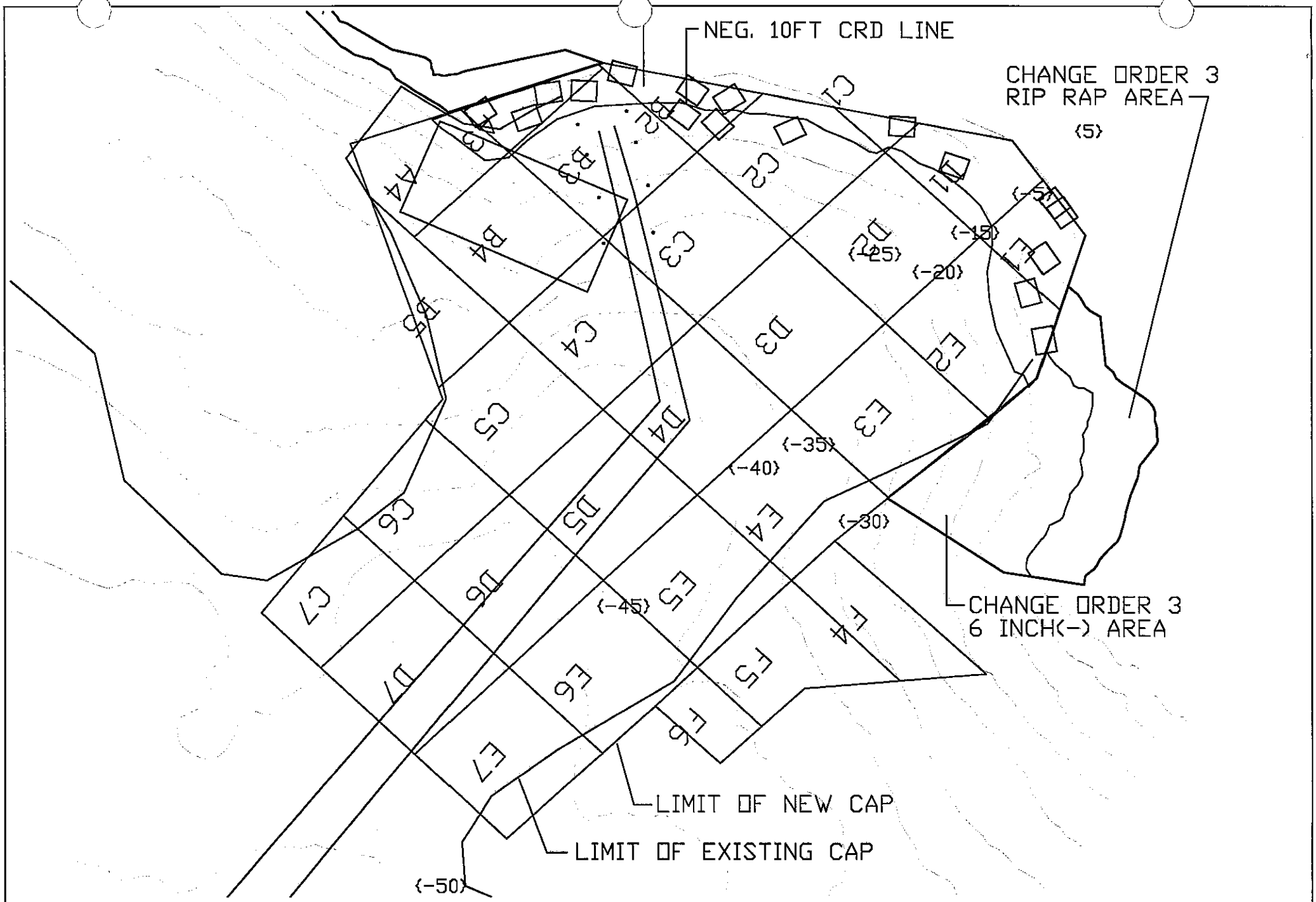
BUCKET LOG & SUMMARY

Placed: 8/9/2005

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

Material: SAND 1.35 TN/CY

Bucket #	Time	Bucket Center Point X	Y
89	1225	7627496.09	704776.68
90	1227	7627480.97	704785.61
91	1229	7627478.89	704772.30
92	1230	7627471.51	704752.44
93	1231	7627467.72	704769.57
94	1232	7627463.91	704770.89
95	1233	7627459.59	704784.38
96	1234	7627471.11	704768.86
97	1235	7627470.76	704756.11
98	1236	7627475.39	704769.35
99	1236	7627475.39	704769.35
100	1242	7627482.61	704767.94
101	1249	7627472.62	704761.53
102	1250	7627464.11	704793.38
103	1252	7627472.03	704771.27
104	1253	7627489.80	704750.11
105	1254	7627487.09	704744.71
106	1255	7627496.57	704763.29
107	1255	7627492.75	704764.01



BUCKET LOCATIONS: 4' OF GRAVEL FILTER	
PROJECT: DEQ McCORMICK & BAXTER	AADS JOB# 1105-533
ADVANCED AMERICAN DIVING SERVICE, INC.	9-14-05

GRAVEL PLACEMENT SUMMARY
DEQ McCORMICK & BAXTER
ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

CELL #	TARGET (CY)	TARGET (TN)		ESTIMATE (CY)	ESTIMATE (TN)
E2	10	14		11	15
E1	13	18		11	15
D1	14	19		8	11
C1	3	4		3	4
C2	5	7		8	11
B2	7	9		23	31
B3	4	5		5	7
A3	9	12		12	16
A4	3	4		3	4
TOTAL	68	92	0	84	113

TOTAL TONS PURCHASED	111 TN
TONAGE REQUIRED (NEAT)	92 TN

BUCKET LOG & SUMMARY PLACED: 8/27/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: GRAVEL **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	835	7627643.28	704727
2	837	7627653.66	704762.58
3	837	7627656.54	704758.85
4	841	7627593.89	704793.42
5	845	7627549.87	704791.6
6	900	7627525.89	704804.43
7	913	7627649.59	704708.58
8	916	7627614.37	704777.65
9	916	7627649.64	704740.8
10	1319	7627508.22	704798.23
11	1321	7627521.34	704794.22
12	1322	7627483.91	704814.71
13	1323	7627511.47	704807.87
14	1325	7627468.78	704807.84
15	1327	7627427.98	704799.24
16	1328	7627454.67	704807.01
17	1333	7627446.28	704796.91

IT IS BELIEVED THAT BUCKET # 2&3 ARE IN FACT ONLY ONE BUCKET WHICH WAS MARKED TWICE ACCIDENTALLY.

GRID SPACES TO RECEIVE FILL

ABOVE -10 CRD IN CELLS E2, E1, D1, C1, C2, B2, B3, A3, & A4.

AMOUNT OF MATERIAL PLACED

111 TONS via 420 BARGE (9-2)

AVERAGE BUCKET LOAD

111 TONS
16 BUCKETS
6.94 TON/BUCKET
5.14 CY/BUCKET

NOTES:

BARGE #9 CARRIED 671 TN OF 6"(-) AND 111 TN OF GRAVEL FILTER. GRAVEL WAS PLACED IN CELLS B2, C2, C1, D1, E1, & E2 AND THEN OVER LAID WITH 8" OF 6"(-), CHANGE ORDER 2, THEN THE BARGE WAS MOVED TO PLACE GRAVEL IN CELLS B2, B3, A3, & A4 AND AGAIN OVERLAID THE AREA WITH 6"(-) AS PART OF CHANGE ORDER 2.

CELL QUANTITY ESTIMATE

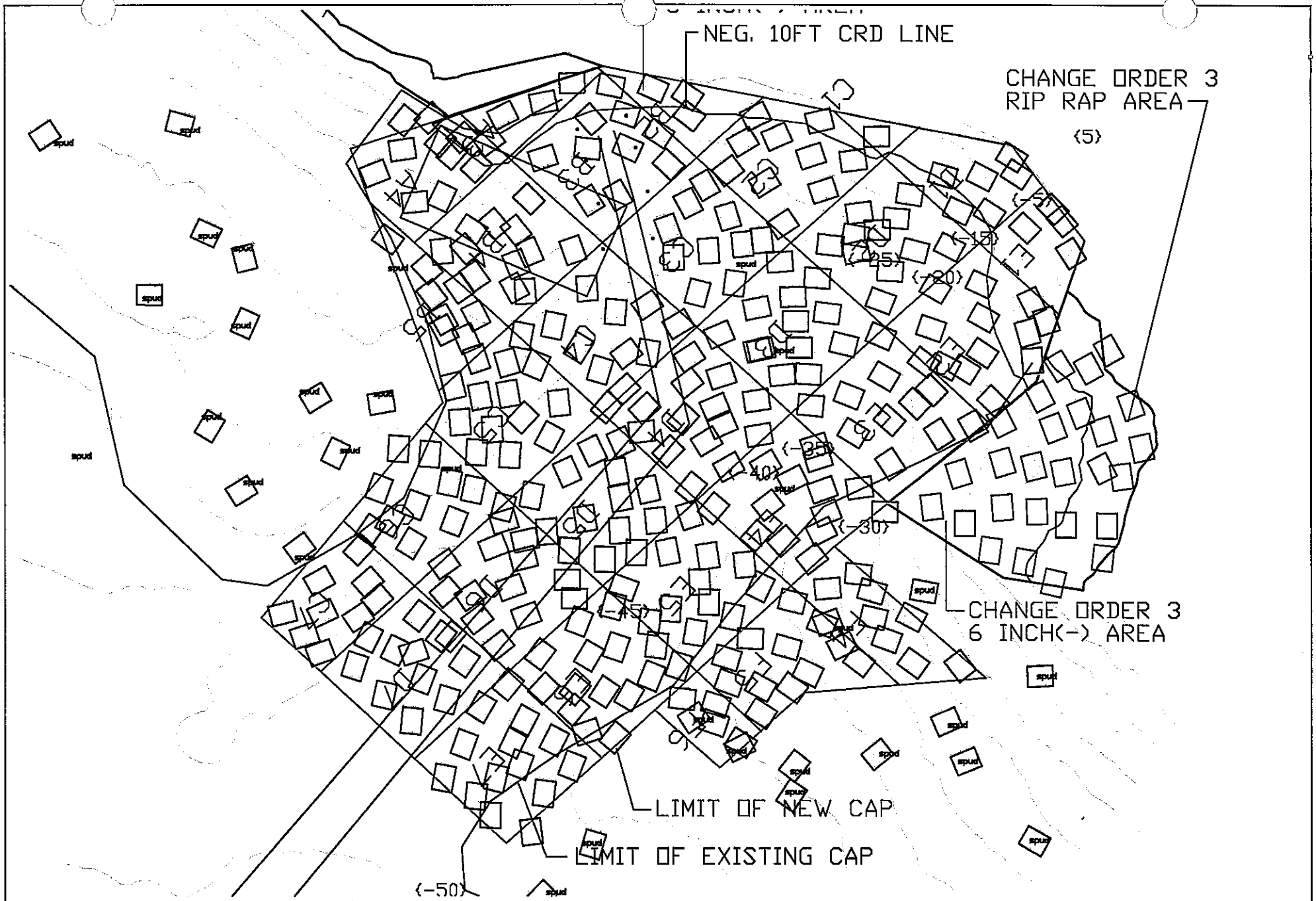
CELL	# BUCKETS	BUCKET SIZE	QUANTITY
E2	2	5.4	10.8
E1	2	5.4	10.8
D1	1.5	5.4	8.1
C1	0.5	5.4	2.7
C2	1.5	5.0	7.5
B2	4.5	5.0	22.5
B3	1	5.0	5
A3	2.5	4.8	12
A4	0.5	5.0	2.5
TOTAL	16	5.1	81.90 CY
			110.57 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)
E2	10	11 complete
E1	13	11 complete
D1	14	8 complete
C1	3	3 complete
C2	5	8 complete
B2	7	23 complete
B3	4	5 complete
A3	9	12 complete
A4	3	3 complete

TOTAL	68	84

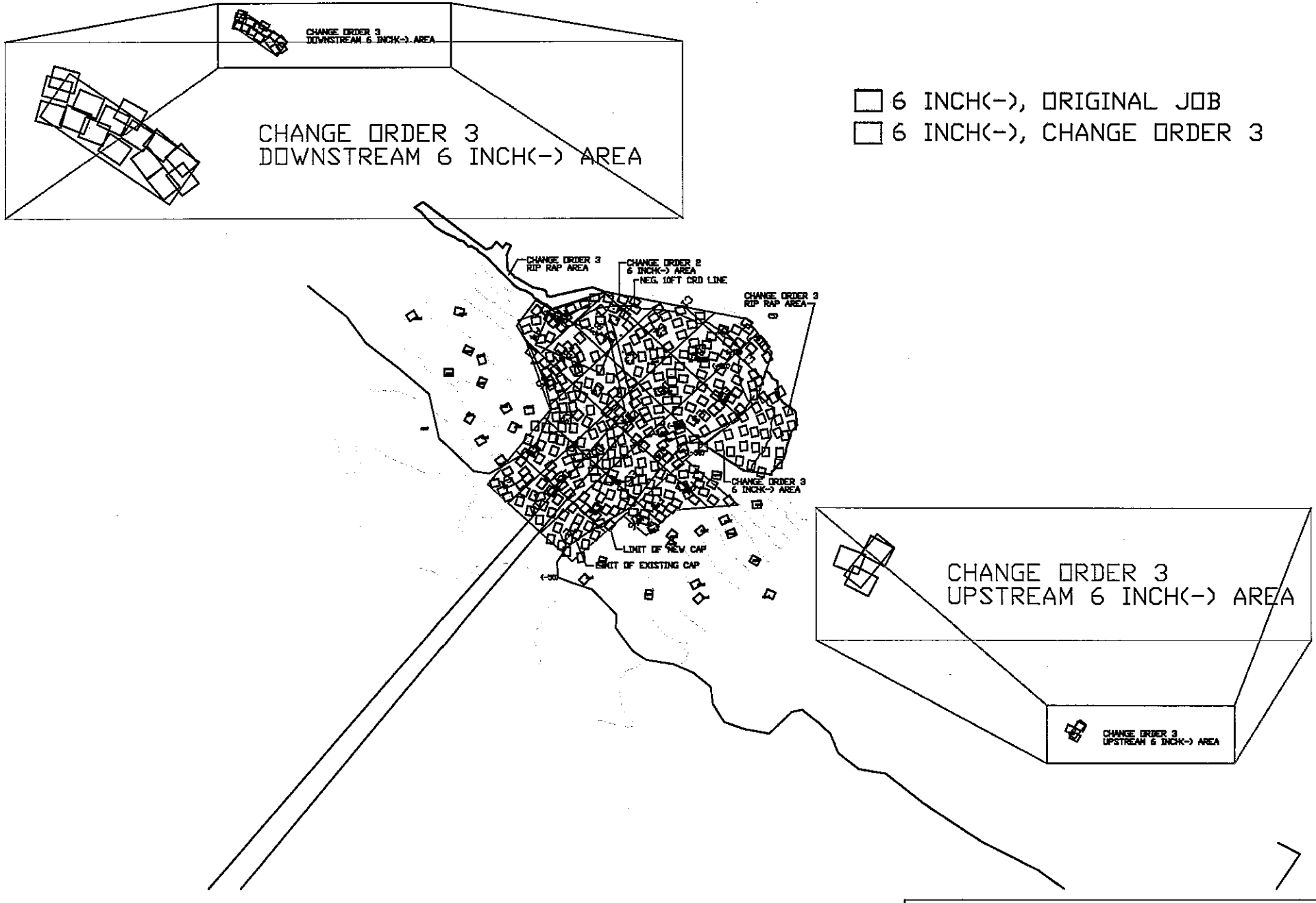
Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.



6 INCH(-), ORIGINAL JOB

6 INCH(-), CHANGE ORDER 3

BUCKET LOCATIONS: 8" OF 6 INCH MINUS	
PROJECT: DEQ McCORMICK & BAXTER	AADS JOB# 1105-533
ADVANCED AMERICAN DIVING SERVICE, INC.	9-14-05



6 INCH MINUS BUCKET LOACTIONS	
PROJECT: DEQ McCORMICK & BAXTER	AADS JOB# 1105-533
ADVANCED AMERICAN DIVING SERVICE, INC.	9-14-05

6INCH PLACEMENT SUMMARY
DEQ McCORMICK & BAXTER
ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

CELL #	TARGET (CY)	TARGET (TN)	ESTIMATE (CY)	ESTIMATE (TN)
A4	43	58	50	68
A3	17	23	20	27
B4	62	84	60	81
B3	62	84	45	61
B2	24	32	21	29
C5	61	82	71	96
C4	62	84	58	78
C3	62	84	53	72
C2	58	78	55	74
C1	6	8	6	7
D2	62	84	64	86
D1	38	51	33	45
E2	64	87	55	74
E1	26	35	28	37
F6	19	26	26	35
F5	51	69	44	59
F4	40	54	31	42
D7	62	84	50	68
D6	62	84	45	61
D4	62	84	60	81
D3	62	84	59	80
E7	61	82	63	85
E5	62	84	66	89
E4	63	85	67	90
E3	66	89	59	80
CO3	145	196	133	180
B5	34	46	40	54
C6	51	69	57	77
C7	43	58	47	63
D5	62	84	76	103
E6	62	84	78	105
U.S. CO3	4	5	14	19
D.S. CO3	30	41	72	97
SPUDS	remainder	remainder	130	176
TOTAL			1835	2478

TOTAL TONS PURCHASED	2472 TN
TONAGE REQUIRED (NEAT) MINUS SPUDS	2278 TN

BUCKET LOG & SUMMARY — PLACED: 8/27/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: 6 INCH MINUS — **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	927	7627644.93	704725.13
2	929	7627650.7	704717.67
3	930	7627645.14	704702.02
4	932	7627643.31	704713.01
5	935	7627642.35	704754.99
6	939	7627660.42	704744.76
7	942	7627653.23	704762.59
8	945	7627656.93	704757.62
9	947	7627610.06	704775.95
10	950	7627637.15	704783.1
11	952	7627639.1	704776.36
12	954	7627625.41	704775.52
13	957	7627628.42	704760.85
14	958	7627584.01	704791.26
15	1003	7627561.56	704797.36
16	1008	7627536.42	704799.27
17	1012	7627591.65	704758.83
18	1013	7627612.68	704747.3
19	1015	7627598.97	704745.86
20	1017	7627575.66	704751.98
21	1018	7627597.04	704768.41
22	1023	7627589.35	704737.61
23	1043	7627575.9	704745.28
24	1044	7627577.2	704761.05
25	1047	7627616.07	704761.8
26	1049	7627584.26	704754.17
27	1054	7627562.93	704769.96
28	1056	7627574.78	704781.79
29	1058	7627539.96	704773.03
30	1100	7627558.18	704783.47
31	1102	7627525.57	704777.69
32	1104	7627544.73	704791.14
33	1106	7627531.44	704789.07
34	1108	7627547.18	704756.42
35	1123	7627629.76	704686.03
36	1124	7627625.59	704705
37	1125	7627605.37	704714.68
38	1127	7627625.98	704718.97
39	1129	7627625.07	704732.37
40	1131	7627610.93	704699.93
41	1132	7627618.58	704698.5
42	1247	7627509.75	704807.31
43	1250	7627496.17	704810.12

GRID SPACES TO RECEIVE FILL

A4, A3, B4, B3. B2, C4, C3, C2, C1, D2, D1, E2, & E1

AMOUNT OF MATERIAL PLACED

671 TONS via 420 BARGE (9-1)

AVERAGE BUCKET LOAD

671 TONS
94 BUCKETS
7.14 TON/BUCKET
5.29 CY/BUCKET

NOTES:

ALL CELLS TO RECEIVE FILL ARE COMPLETE WITH THE EXCEPTION OF B4 WHICH WAS ONLY PARTIALLY COMPLETED. AS PART OF CHANGE ORDER 2, THE AREA ABOVE THE -10 CRD LINE WAS TO RECEIVE 8" OF 6"(-) MATERIAL. DURRING PLACEMENT AND IN THIS SUMMARY NO DISTINCTION WAS OR WILL BE MADE BETWEEN BUCKETS OF CHANGE ORDER 2 MATERIAL & THAT OF THE ORIGINAL JOB. HOWEVER PLEASE NOTICE THAT THE CELL QUANTITIES HAVE CHANGED FOR THOSE CELLS CLOSEST TO SHORE & THAT THE PURCHASE TOTAL FOR THE 6"(-) WILL HAVE INCREASED.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
A4	10	5.0	50
A3	4	5.0	20
B4	7	5.0	35
B3	9	5.0	45
B2	4	5.3	21.2
C5	2	5.3	10.6
C4	7	5.3	37.1
C3	10	5.3	53
C2	10	5.5	55
C1	1	5.5	5.5
D2	9	5.5	49.5
D1	6	5.5	33
E2	10	5.5	55
E1	5	5.5	27.5
TOTAL	94	5.3	497.40 CY
			671.49 TN

C5 not mentioned as receiving fill above and C1 showed placement on 9/9

CELL QUANTITY ESTIMATE

TARGET (CY) ESTIMATE (CY)

44	1252	7627464.21	704812.22
45	1255	7627436.96	704799.6
46	1255	7627420.92	704790.93
47	1258	7627479.55	704811.19
48	1305	7627398.06	704797.64
49	1308	7627452.89	704804.63
50	1308	7627431.55	704789.42
51	1309	7627408.33	704798.57
52	1315	7627510.38	704799.39
53	1347	7627485.21	704800.08
54	1351	7627412.34	704789.34
55	1357	7627416.9	704784.35
56	1359	7627426.57	704779.22
57	1403	7627413.01	704767.44
58	1416	7627525.5	704759.45
59	1417	7627528.17	704732.63
60	1421	7627516.45	704771.86
61	1424	7627517.85	704745.68
62	1427	7627513.54	704728.78
63	1429	7627501.88	704754.64
64	1431	7627531.16	704748.35
65	1433	7627538.89	704749.96
66	1434	7627509.85	704764.75
67	1435	7627504.12	704743.02
68	1440	7627498.24	704792.43
69	1441	7627502.16	704780.16
70	1444	7627486.12	704786.69
71	1448	7627470.32	704786.52
72	1450	7627471.5	704798.03
73	1452	7627452.71	704782.75
74	1505	7627471.03	704765.83
75	1508	7627482.19	704767.95
76	1510	7627464.5	704745.95
77	1513	7627447.14	704766.49
78	1514	7627442.09	704753.87
79	1518	7627447.4	704745.21
80	1519	7627456.83	704715.76
81	1523	7627466.83	704706.98
82	1525	7627470.05	704730.6
83	1526	7627481.31	704721.16
84	1527	7627397.31	704786.11
85	1535	7627442.15	704740.49
86	1539	7627386.37	704776.69
87	1541	7627402.28	704765.31
88	1543	7627445.68	704729.45
89	1544	7627424.6	704754.35
90	1551	7627475.13	704698.23
91	1553	7627494.1	704705
92	1602	7627444.72	704679.63
93	1602	7627449.99	704700.15
94	1604	7627444.34	704711.86

A4	43	50	
A3	17	20	
B4	62	35	
B3	62	45	
B2	24	21	
C5	61	11	
C4	62	37	
C3	62	53	
C2	58	55	
C1	6	6	
D2	62	50	
D1	38	33	
E2	64	55	
E1	26	28	
TOTAL	646	497	CY

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

BUCKET LOG & SUMMARY

PLACED: 8/31/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: 6 INCH MINUS **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	1442	7627530.4	704552.01
2	1443	7627519.94	704559.6
3	1445	7627507.4	704569.07
4	1446	7627520.57	704566.88
5	1447	7627538.4	704563.34
6	1448	7627525.93	704575.24
7	1450	7627524.92	704584.99
8	1451	7627550.63	704573.34
9	1455	7627538.26	704573.68
10	1517	7627576.96	704583.55
11	1519	7627562.44	704598.54
12	1521	7627550.73	704607.38
13	1522	7627556.78	704579.24
14	1524	7627548.51	704589.2
15	1525	7627534.09	704592.64
16	1536	7627616.62	704581.84
17	1538	7627597.52	704601.21
18	1540	7627576.64	704618.21
19	1541	7627582.57	704601.02
20	1543	7627564.53	704612.46
21	1545	7627598.29	704582.95
22	1548	7627587.88	704592.36
23	1550	7627582	704611.37

GRID SPACES TO RECEIVE FILL

F6, F5, & F4

AMOUNT OF MATERIAL PLACED

109 TONS via 419 BARGE (11-2)

AVERAGE BUCKET LOAD

109 TONS
23 BUCKETS
4.74 TON/BUCKET
3.51 CY/BUCKET

NOTES:

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
F6	4	4.0	16
F5	11	3.5	38.5
F4	8	3.3	26.4
TOTAL	23	3.5	80.90 CY
			109.22 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)
A4	43	50
A3	17	20
B4	62	35
B3	62	45
B2	24	21
C5	61	11
C4	62	37
C3	62	53
C2	58	55
C1	6	6
D2	62	50
D1	38	33

E2	64	55
E1	26	28
F6	19	16
F5	51	39
F4	40	26
TOTAL	756	578 CY

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

BUCKET LOG & SUMMARY PLACED: 9/1/05 & 9/6/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: 6 INCH MINUS **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	1120	7627537.25	704706.23
2	1120	7627538.53	704706.2
3	1120	7627553.49	704707
4	1120	7627571.04	704708.34
5	1121	7627564.55	704720.67
6	1121	7627551.07	704727.13
7	1121	7627545.91	704741.25
8	1121	7627560.67	704734.76
9	1121	7627536.85	704722.66
10	1121	7627522.05	704712.13
11	1122	7627552.08	704717.37
12	1122	7627546.79	704696.24
13	1122	7627557.05	704696.57
14	1126	7627586.91	704695.74
15	1126	7627618.61	704638.32
16	1127	7627616.17	704657.84
17	1127	7627605.56	704644.76
18	1128	7627628.56	704627.71
19	1128	7627633.3	704644.6
20	1128	7627633.37	704662.23
21	1128	7627632.95	704678.04
22	1128	7627642.1	704623.08
23	1129	7627653.4	704614.86
24	1129	7627658.3	704637.82
25	1129	7627657.17	704658.52
26	1129	7627653.38	704675.65
27	1129	7627648.17	704687.95
28	1129	7627655.76	704699.9
29	1129	7627664.21	704681.43
30	1130	7627672.58	704659.92
31	1130	7627674.51	704637.37
32	1130	7627672.88	704624.65
33	1130	7627680.17	704656.67
34	1131	7627688.17	704668
35	1131	7627683.93	704684.53
36	1131	7627675.14	704706.05
37	1131	7627667.26	704698.98
38	1132	7627672.98	704674.5
39	1132	7627646.92	704643
40	1132	7627645.7	704660.67
41	1135	7627585.64	704711.58
42	1141	7627598.99	704685.07
43	1144	7627608.48	704673.25

GRID SPACES TO RECEIVE FILL

C5, D6, C4, D4, D3, D2, E5, E4, E3, & CHANGE ORDER #3 AREA

AMOUNT OF MATERIAL PLACED

800 TONS via 420 BARGE (12)

AVERAGE BUCKET LOAD

800 TONS
130 BUCKETS
6.15 TON/BUCKET
4.56 CY/BUCKET

NOTES:

THE BARGE WAS NOT COMPETED IN ONE DAY. MATERIAL FROM THIS BARGE WAS USED ON THE CHANGE ORDER #3 AREA.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
C5	2	4.2	8.4
C4	5	4.2	21
D7	12	4.2	50.4
D6	10	4	40
D4	15	4	60
D3	13	4.5	58.5
D2	3	4.5	13.5
E7	14	4.5	63
E5	4	4.8	19.2
E4	14	4.8	67.2
E3	12	4.9	58.8
CO3	26	5.1	132.6
TOTAL	130	4.6	592.60 CY
			800.01 TN

CELL QUANTITY ESTIMATE

	TARGET (CY)	ESTIMATE (CY)
A4	43	50
A3	17	20
B4	62	35

44	1145	7627605.54	704690.35
45	1147	7627573.04	704688.22
46	1148	7627557.99	704684.38
47	1150	7627574.77	704673.58
48	1151	7627589.38	704661.62
49	1153	7627589	704678.66
50	1156	7627621.81	704676.53
51	1200	7627602.43	704701.38
52	1251	7627607.08	704730.44
53	1253	7627585.6	704725.56
54	1255	7627565.73	704748
55	1258	7627505.94	704716.22
56	1300	7627493.77	704723.86
57	1302	7627510.27	704703.34
58	1303	7627509.56	704693.02
59	1304	7627507.89	704679.09
60	1309	7627492.64	704683.16
61	1312	7627522.87	704695.69
62	1314	7627491.53	704674.07
63	1319	7627477.71	704683.57
64	1320	7627485.55	704704.63
65	1325	7627484.73	704690.67
66	1327	7627455.19	704672.04
67	1330	7627520.4	704683.6
68	1331	7627501.99	704666.48
69	1332	7627536.69	704686.19
70	1333	7627510.99	704652.25
71	1334	7627537.6	704672.79
72	1335	7627517.04	704670.32
73	1336	7627525.73	704660.35
74	1338	7627523.2	704676.84
75	1353	7627547.12	704631.19
76	1355	7627519.73	704644.11
77	1358	7627540.27	704661.16
78	1400	7627541.11	704645.34
79	1402	7627559.68	704668.53
80	1404	7627577.16	704652.24
81	1411	7627564.08	704642.27
82	1412	7627562.17	704635.02
83	1413	7627536.51	704633.3
84	1414	7627560.83	704663.63
85	1415	7627562.62	704651.42
86	1416	7627550.78	704655.4
87	1417	7627558.45	704624.18
88	1419	7627587.15	704642.84
89	1425	7627527.08	704601.35
90	1430	7627538.08	704613.2
91	1504	7627462.17	704615.92
92	1506	7627439.88	704612.89
93	1507	7627424	704609.68
94	1509	7627413.67	704622.13

B3	62	45
B2	24	21
C5	61	19
C4	62	58
C3	62	53
C2	58	55
C1	6	6
D2	62	64
D1	38	33
E2	64	55
E1	26	28
F6	19	16
F5	51	39
F4	40	26
D7	62	50
D6	62	40
D4	62	60
D3	62	59
E7	61	63
E5	62	19
E4	63	67
E3	66	59
CO3	145	133
TOTAL	1401	1172 CY

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

95	835	7627437.19	704639.1
96	836	7627433.07	704628.88
97	837	7627445.52	704631.58
98	838	7627426.73	704600.49
99	840	7627464.95	704608.54
100	841	7627434.97	704589.92
101	844	7627445.98	704601.78
102	859	7627444.89	704624.3
103	900	7627414.22	704611.17
104	901	7627400.86	704560.48
105	902	7627405.15	704576.77
106	903	7627416.29	704593.48
107	904	7627414.74	704568.6
108	905	7627421.56	704583.61
109	906	7627390.03	704570.5
110	908	7627394.36	704588.01
111	914	7627403.71	704601.74
112	915	7627378.39	704581.77
113	917	7627383.83	704593.17
114	918	7627412.45	704593.59
115	919	7627401.6	704587.2
116	927	7627484.28	704612.87
117	947	7627457	704552.84
118	948	7627453.01	704532.28
119	949	7627463.98	704542.92
120	950	7627447.9	704517.22
121	954	7627445.26	704560.46
122	1000	7627431.85	704523.75
123	1002	7627433.97	704538.28
124	1011	7627440.75	704552.07
125	1012	7627413.47	704538.24
126	1013	7627421.52	704551.39
127	1015	7627428.33	704565.79
128	1016	7627438.82	704574.62
129	1017	7627443.5	704543.48
130	1024	7627426.08	704531.2

BUCKET LOG & SUMMARY PLACED: 9/9/05 & 9/13/05

ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

MATERIAL: 6 INCH MINUS **1.35 TN/CY**

BUCKET #	TIME	BUCKET CENTER POINT X	Y
1	918	7627297.5	704728.1
2	936	7627391.62	704750.4
3	939	7627407.08	704738.42
4	943	7627412.83	704745.56
5	946	7627425.78	704735.47
6	947	7627408.93	704728.04
7	949	7627422.25	704746.51
8	951	7627419.68	704730.78
9	952	7627426.2	704719.66
10	954	7627413.35	704718.19
11	956	7627422.53	704710.64
12	957	7627413.66	704713.92
13	1000	7627417.32	704691.94
14	1001	7627458.97	704685.31
15	1003	7627438.49	704701.08
16	1006	7627439.63	704665.18
17	1007	7627439.01	704688.9
18	1008	7627427.88	704688
19	1008	7627426.58	704702.62
20	1011	7627426.42	704666.15
21	1012	7627419.91	704677.88
22	1016	7627436.92	704644.58
23	1017	7627432.65	704675.1
24	1019	7627441.45	704730.78
25	1019	7627433.63	704756.53
26	1027	7627408.04	704665.45
27	1028	7627415.84	704654.29
28	1029	7627425.16	704651.6
29	1030	7627417.55	704639.04
30	1031	7627448.15	704649.13
31	1033	7627400.66	704630.39
32	1034	7627402.37	704645.54
33	1038	7627395.72	704667.61
34	1039	7627388.03	704652.02
35	1042	7627384.59	704635.7
36	1044	7627392.37	704639.13
37	1050	7627349.94	704602.62
38	1054	7627380.1	704627.92
39	1055	7627364.39	704615.59
40	1058	7627358.67	704593.87
41	1100	7627364.88	704587.01
42	1101	7627365.74	704602.79
43	1108	7627383.59	704615.06

GRID SPACES TO RECEIVE FILL

B4, B5, C5, C6, C7, D6, D7, E5, E6, F6, F5, F4, UP & DOWN STREAN C.O. AREAS, & SPUDS

AMOUNT OF MATERIAL PLACED

892 TONS via ZB31 BARGE (13)

AVERAGE BUCKET LOAD

892 TONS
130 BUCKETS
6.86 TON/BUCKET
5.08 CY/BUCKET

NOTES:

FINISHED PLACING 6"(-) IN THE GRID AREA. USED REMAINING MATERIAL TO FOR THE UP & DOWN STREAM CHANGE ORDER 3 AREAS AND SPUD MARKS.

CELL QUANTITY ESTIMATE

CELL	# BUCKETS	BUCKET SIZE	QUANTITY
B4	5	5.0	25 X
B5	8	5.0	40 X
C5	10	5.2	52 X
C6	11	5.2	57.2 X
C7	9	5.2	46.8 X
D6	1	5.4	5.4 X
D5	14	5.4	75.6 X
E5	9	5.2	46.8 X
E6	15	5.2	78 X
F6	2	5	10 X
F5	1	5	5 X
F4	1	5	5 X
U.S. CO3	3	4.8	14.4
D.S. CO3	15	4.8	72
SPUDS	26	5.0	130
TOTAL	130	5.1	663.20 CY
			895.32 TN

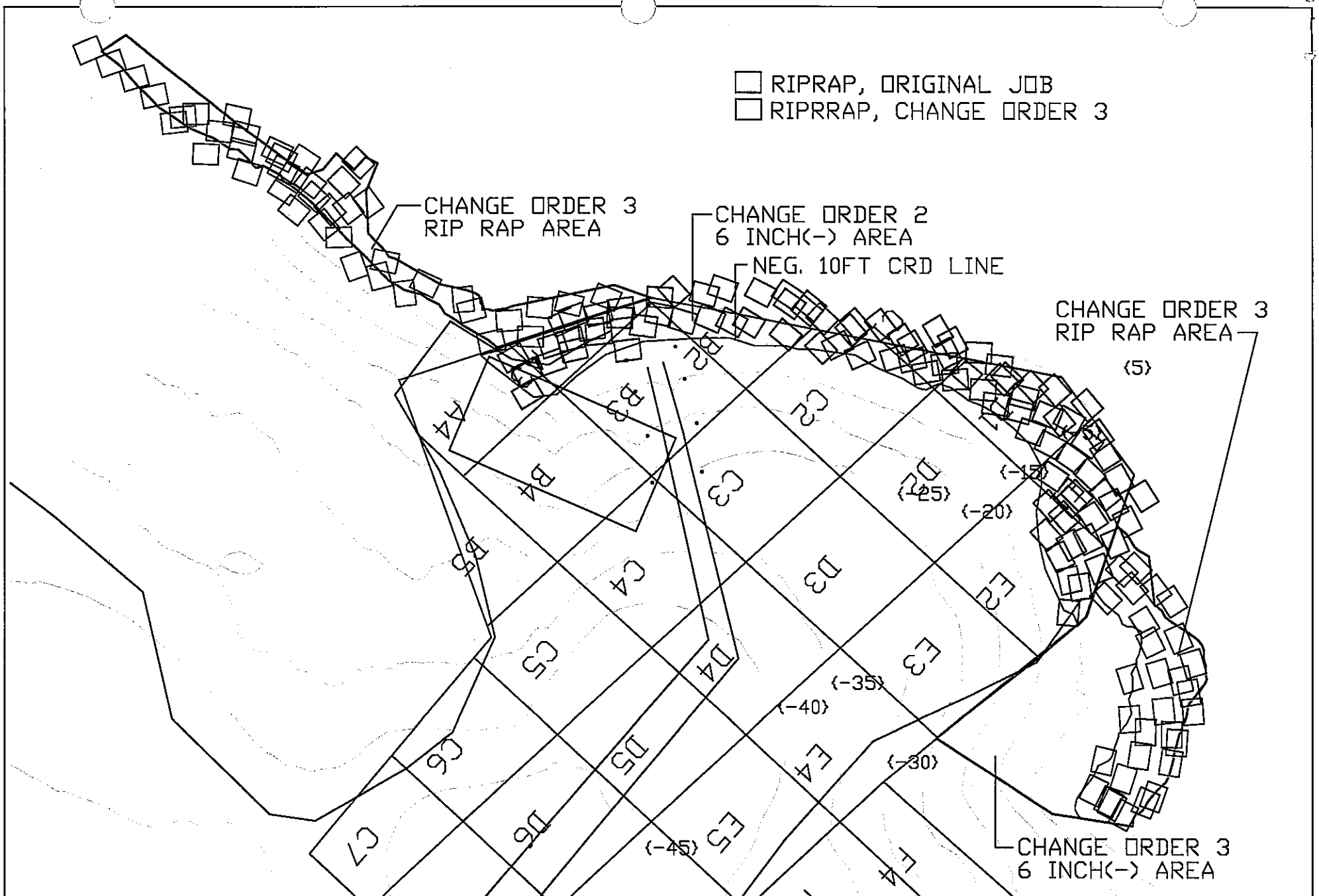
CELL QUANTITY ESTIMATE

44	1109	7627379.79	704601.18
45	1111	7627387.24	704608.27
46	1133	7627483.31	704670.04
47	1135	7627496.97	704639.27
48	1137	7627493.89	704651.51
49	1139	7627489.36	704626.71
50	1141	7627483.13	704648.16
51	1142	7627476.91	704624.02
52	1145	7627469.24	704640.04
53	1147	7627462.07	704658.47
54	1149	7627472.12	704666.71
55	1150	7627481.71	704658.54
56	1154	7627454.16	704634.98
57	1155	7627462.91	704627.45
58	1157	7627482.77	704635.41
59	1238	7627465.23	704572.67
60	1238	7627480.24	704605.69
61	1242	7627470.72	704585.89
62	1244	7627464.59	704564.78
63	1246	7627480.94	704553.99
64	1248	7627452.86	704573.01
65	1250	7627466.83	704599.37
66	1251	7627451.53	704586.42
67	1254	7627362.97	704687.37
68	1256	7627388.96	704685.43
69	1309	7627481.49	704589.24
70	1310	7627469.9	704556.13
71	1312	7627486.51	704570.25
72	1315	7627497.31	704590.02
73	1321	7627495.26	704577.91
74	1322	7627502.83	704604.45
75	1323	7627501.75	704626.98
76	1325	7627494.57	704599.21
77	1338	7627476.73	704571.74
78	1340	7627506.05	704581.87
79	1342	7627512.39	704595.07
80	1344	7627510.26	704641.33
81	1345	7627517.5	704625.32
82	1346	7627517.85	704607.07
83	1350	7627531.92	704621.88
84	1351	7627514.23	704615.08
85	913	7627256.16	704791.86
86	915	7627309.65	704796.45
87	917	7627335.18	704716.71
88	921	7627335.06	704742.86
89	924	7627319.97	704753
90	927	7627333.79	704651.1
91	929	7627356.64	704628.58
92	932	7627370.91	704665.87
93	939	7627321.26	704676.37
94	942	7627408.64	704656.31

	TARGET (CY)	ESTIMATE (CY)
A4	43	50
A3	17	20
B4	62	60
B3	62	45
B2	24	21
C5	61	71
C4	62	58
C3	62	53
C2	58	55
C1	6	6
D2	62	64
D1	38	33
E2	64	55
E1	26	28
F6	19	26
F5	51	44
F4	40	31
D7	62	50
D6	62	45
D4	62	60
D3	62	59
E7	61	63
E5	62	66
E4	63	67
E3	66	59
CO3	145	133
B5	34	40
C6	51	57
C7	43	47
D5	62	76
E6	62	78
U.S. CO3	4	14
D.S. CO3	30	72
SPUDS	remainder	130

Bucket size values (CY/Bucket) are not based on any tangible data. All values used are educated guesses based on the observation of relative bucket sizes while observing a 5.5 CY max load. The values used will satisfy the average bucket size for the entire barge along with the total tonnage but may not be the only combination of bucket sizes to do so.

95	944	7627451.9	704492.19
96	946	7627472.09	704512.29
97	949	7627525.26	704474.34
98	1014	7627663.16	704474.77
99	1016	7627581.91	704469.73
100	1018	7627578.53	704486.24
101	1025	7627645.88	704513.54
102	1032	7627619	704544.69
103	1035	7627611.32	704560.1
104	1037	7627648.1	704577.92
105	1040	7627584.07	704547.48
106	1043	7627550.32	704531.4
107	1045	7627551.5	704542.92
108	1059	7627529.93	704550.2
109	1100	7627511.89	704561.65
110	1116	7627564.58	704599.09
111	1118	7627602.5	704611.41
112	1120	7627570.3	704589.81
113	1141	7628004.31	704322.43
114	1143	7628015.08	704325.78
115	1146	7628008.79	704314.4
116	1326	7627101.22	705100.13
117	1328	7627108.53	705101.75
118	1329	7627095.04	705108.21
119	1333	7627058.42	705126.85
120	1334	7627060.82	705136.51
121	1336	7627063.49	705140.09
122	1338	7627067.76	705124.77
123	1340	7627072.62	705130.71
124	1343	7627082.81	705113.41
125	1344	7627108.3	705109.05
126	1354	7627099.92	705114.76
127	1355	7627088.73	705126.62
128	1357	7627091.49	705118.64
129	1400	7627074.89	705120.32
130	1401	7627082.26	705124.37



BUCKET LOCATIONS: 2' OF RIPRAP	
PROJECT: DEQ McCORMICK & BAXTER	AADS JOB# 1105-533
ADVANCED AMERICAN DIVING SERVICE, INC.	9-14-05

RIP RAP PLACEMENT SUMMARY
DEQ McCORMICK & BAXTER
ADVANCED AMERICAN DIVING SERVICE, JOB #1105-533

TOTAL TONAGE PURCHASED	1212 TN		
ORIGINAL JOB	611 TN	ZB31 BARGE (10)	PLACED 8-29-05 & 8-30-05
CHANGE ORDER MATERIAL	601 TN	419 BARGE (14)	PLACED 9-7-05 & 9-8-05

SUBMITTAL 02210-2

Note: This page intentionally left blank.

E&E Transmittal Rec'd # 2

ADVANCED AMERICAN
DIVING SERVICE, INC.
415 S. McLoughlin Blvd. P.O. Box 1630
Oregon City, Oregon 97045
503-650-8207 Fax 503-650-8230

TRANSMITTAL FORM

To: Ecology and Environment, Inc.
2101 Fourth Ave., Suite 1900
Seattle, WA 98121

Ph: 206-624-9537
Fax: 206-621-9832
Attention: Susan Gardner

Date:	8/1/05	**Job No:**	1105-533
Job Name:	McCormick & Baxter Sed Cap		
Job Location:	Portland., OR		
RE:	Submittals - Sediment Cap Materials		

We are sending you herewith the following items:

- [ ] Plans
- [ ] Specifications
- [ ] Prints
- [ ] Shop Drawings
- [ ] Samples
- [ ] Catalogue Cuts
- [ ] Purchase Order
- [ ] Change order
- [ ]

Copies	Dated	No.	Description
6	7/25/05	02210-1 02230-1	Sand, 6" Minus, Gravel - Material Data
			from Morse Bros.
6	6/30/05	02230-2	Rip Rap Source (Quarry Location) and
			contact person at Westside Rock

These items are transmitted as checked below:

- [x] For approval
- [ ] For your use
- [ ] As requested
- [ ] For review and comment
- [x] Approved as submitted - riprap (Source), sand, gravel
- [x] Approved as noted - 6-inch-minus
- [ ] Returned for corrections
- [x] "split portion" page missing, but attached here from last year's information

REMARKS:
Please return 2 copies of the above submittals after your review.

Copy To:

Signed: M. W. Nelson
Mike Nelson

MORSE BROS.
A KRC COMPANY

CCB #2101

FAX COVER SHEET

To: Advanced American	
Attn: Mike Welson	
Fax: 650-8230	
Phone:	

From:	Billy
Date:	7-25-05
Phone:	503-286-4201
Fax:	503-286-8701

☐ Urgent ☐ Please reply ☐ For your information ☐ As requested

Total pages including this cover sheet 4

COMMENTS

Mike,

I just spoke w/ Susan. She has given me verbal approval for the 6" minus, Sand and Gravel filter. Please see attached gradations.

Thanks,

Billy

PORT OF ST. HELENS

Mailing Address: P.O. Box 598, St. Helens, Oregon 97051
Office Location: 100 E Street, Columbia City, Oregon 97018
Telephone: (503) 397-2888 - Fax: (503) 397-6924
Web Page: www.portsh.org

June 9, 2004

Mr. Bill Stimpson
Morse Brothers
1339 NW Eastwood Ave
Gresham OR 97030

Re: Port of St Helens; Columbia City; Dredge Disposal Sands

Dear Mr. Stimpson:

In answer to your questions, the following is provided:

- Date material received – Start 29 Sep 200 – end 10 Oct 2000
- Material from: Upper Martin Island Bar – Navigation Channel
- Disposal site: River mile O-82.8
- All dredging was performed for the US Army Corps of Engineers to support the 40-foot navigation channel
- Dredging was performed by the dredge *Oregon*, by pipeline.
- Calculation of material landed: Approximately 122,000 cy.

I hope this helps.

Sincerely,

Paul Langner

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The Columbia River's *DEEP WATER PORT* ...With A Future

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SUBMITTAL 02230-2

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Westside Rock
PMB # 463
2459 SE TV Hwy
Hillsboro, Oregon 97124

confidential fax

To:	**Mike Nelson (Business Fax)**
Fax Number:	503-650-8230

From:	**Donald Leamon**
Fax Number:	503-640-6674
Business Phone:	503-640-1976
Home Phone:	503-260-0716

Contact for inspection of rip rap

Pages:	4
Date/Time:	6/30/2005 10:11:13 AM
Subject:	Rock Quote - McCormick & Baxter - Portland

Thanks for letting us bid with you.

Donald Leamon
Westside Rock

PMB #463
2459 SE TV HWY
Hillsboro, Oregon
Billing Phone: 503-640-1976
Hayden Quarry: 503-357-9336
Goble Quarry: 503-556-4292

Westside Rock

Hayden Quarry/Goble Quarry

June 30, 2005

Advanced American Diving Service, Inc.
415 S McLoughlin Blvd
Oregon City, OR 97045

Project Name: *McCormick & Baxter - Portland*

To: Mike

Rip Rap source

Thank you for your latest request in our products, unless noted all prices are FOB our Goble Quarry which is located at 70075 Nicolai Road in Rainier, OR. Our staff of qualified personnel is at your service from 7:30 am to 4:00 pm, ready with the latest equipment and state certified scales to efficiently provide you highest quality product available. Our terms are Net Due 10th of the following month, after 10 days a 1% SERVICE CHARGE per month on the unpaid balance, totaling 12 % per year.

Unless notified by a letter of intent or a purchase order this quote expires in 30 days

SUBMITTAL 02230-3

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MORSE BROS., INC
QA/QC DIVISION

(6"-0 Cobble)

AGGREGATE SAMPLE BENCH SHEET

LAB ID #:
PRODUCT NAME: 6"-0 Cobble
PRODUCT CODE:

PROJECT NAME: McCormick & Baxter	DATE SAMPLED: 7-14-04	___ LIGHT RAIN ___ HEAVY RAIN ___ DRY	
PROJECT #:	TIME SAMPLED: 13:45	AMT. REPRESENTED: ☐ MG ☐ TON	
PLANT ID: 05-015-1	SAMPLED AT: P. Stockpile	FEEDER RATE:	TONNAGE SUMMARY: PASSING INCORP.
PRODUCT SOURCE NAME: Watters Q.	SAMPLED BY: [illegible]	ARCHIVE: ☐ YES ☐ NO	REJECT FAILING INCORP.
MBI LOT/SUBLOT:	DATE RECIEVED: 7-14-04	BLENDING SOURCES: % OTHER ___ % NATURAL ___ % CRUSHED ___	
AGENCY LOT/SUBLOT:	TIME RECEIVED: 13:45	SAMPLE TYPE: ODOT PC / MBI PC / MISC / CHECK	

SIEVE ANALYSIS ☐ DRY T-27 ☒ WET T-11/27 ☐ QUICK SHAKE

SIEVE NO.	SPEC LIMITS	MASS 1	MASS 2	TOTAL MASS	% RET	% PASS	FRACTURED PIECES TM 213: ACC. RET	TEST MASS	FRAC MASS	1FACE%	2FACE%	SPECS	ELONGATED PIECES: TEST MASS	ELONG MASS	FLAT MASS
8"	100	0			0	100									
6"	80-90	3067.4			3.6	96									
3"	40-50	36066.0			42.9	54									
2"		15043.4			17.9	36									
1½"		10221.0			12.1	24									
1"	10-20	9578.1			11.4	12									
3/4"		1675.1			2.0	10									
1/2"		2367.5			2.8	7.3	(Factor = .073)								
10						1.5									
40	0-5	(See split portion)				0.7									
200	0-5					0.4									
PAN															

MOISTURE = ((A - B) / (B - T)) x 100	SUM OF SIEVES (F) =	FM TM 771		SE T 176	REMARKS:
WET AGG + PAN A =	INITIAL DRY WT (G) = 84125.2	D & C TM 226		1	
DRY AGG + PAN B =	POST WASH WT (H) =	ELONG. TM 229		2	
PAN TARE T =	WASH LOSS (I) (G - H) =	WOOD TM 225		3	
MOISTURE =	WASH LOSS % (I / G) x 100 =	2.00mm / 6.3mm		AVG. >	
OTHER:	ERROR RATE % ((H - F) / H) x 100 =	CLEAN TM 227		OTHER:	Revision Date: 12/04/97

MBI ANGELL QUARRY
MBI DEER ISLAND
07/16/2004 08:04 5033971973
P.02

MORSE BROS., INC
QA/QC DIVISION

(6" - Sieve fraction)

AGGREGATE SAMPLE BENCH SHEET

LAB ID #:
PRODUCT NAME: 6" minus Cobble
PRODUCT CODE:

PROJECT NAME: McCormick & Baxter	DATE SAMPLED:	____ LIGHT RAIN ____ HEAVY RAIN ____ DRY	
PROJECT #:	TIME SAMPLED:	AMT. REPRESENTED: ☐ MG ☐ TON	
PLANT ID: 16	SAMPLED AT:	FEEDER RATE:	TONNAGE SUMMARY: PASSING INCORP.
PRODUCT SOURCE NAME: Boulders	SAMPLED BY:	ARCHIVE: ☐ YES ☐ NO	REJECT FAILING INCORP.
MBI LOT/SUBLOT: Washers	DATE RECIEVED:	BLENDING SOURCES: % OTHER ____ % NATURAL ____ % CRUSHED ____	
AGENCY LOT/SUBLOT: 05-015-1	TIME RECEIVED:	SAMPLE TYPE: ODOT PC / MBI PC / MISC / CHECK	

SIEVE ANALYSIS ☐ DRY T-27 ☐ WET T-11/27 ☐ QUICK SHAKE

SIEVE SIZE	SPEC LIMITS	MASS 1	MASS 2	TOTAL MASS	% RET	% PASS	ACC. RET	TEST MASS	FRAC MASS	1FACE%	2FACE%	SPECS	TEST MASS	ELONG MASS	FLAT MASS
							(x Factor = .073)								
							Corrected % passing								
3/8"		449.9			20.7	79	6								
1/4"		558.9			25.7	54	4								
4		266.9			12.3	41	3								
8		385.3			17.7	24	2								
10		62.1			2.9	21	1.5								
16		116.9			5.4	15	1.1								
30		87.8			4.0	11	0.8								
40	0-5	24.8			1.1	10	0.7								
50	0-5	26.7			1.2	9	0.7								
200	0-5	75.9			3.5	5.5	0.4								
Pan		6.2			0.3										

FRACTURED PIECES TM 213 | ELONGATED PIECES

MOISTURE = ((A - S) / (B - T)) x 100	SUM OF SIEVES (F) =	FM TM 17/1	SE T 176
WET AGG + PAN A =	INITIAL DRY WT (G) = 2172.5	D & C TM 216	1
DRY AGG + PAN B =	POST WASH WT (H) = 2061.4	ELONG. TM 229	2
PAN TARE T =	WASH LOSS (I) (G - H) =	WOOD TM 225	3
MOISTURE =	WASHLOSS % (I / G) x 100 =	2.00mm / 6.3mm	AVG. >
OTHER:	ERROR RATE % [(H - F) / H] x 100 =	CLEAN TM 227	OTHER:

REMARKS:

Revision Date: 12/04/97

MORSE BROS., INC
QA/QC DIVISION

AGGREGATE SAMPLE BENCH SHEET

LAB ID #:
PRODUCT NAME: 2" - 1/2" Gravel Filter
PRODUCT CODE: 2020-2.000-0.500-00

PROJECT NAME: McCormick & Baker	DATE SAMPLED: 7-12-04	___ LIGHT RAIN ___ HEAVY RAIN	X DRY		
PROJECT #:	TIME SAMPLED: 15:20	AMT. REPRESENTED:	☐ MG	☐ TON	
PLANT ID: 20 26-01B-1	SAMPLED AT: P. Belt	FEEDER RATE:		TONNAGE SUMMARY:	PASSING INCORP.
PRODUCT SOURCE NAME: Angell Q.	SAMPLED BY: [illegible]	ARCHIVE: ☐ YES	X NO	REJECT	FAILING INCORP.
MBI LOT/SUBLOT:	DATE RECIEVED: 7-12-04	BLENDING SOURCES: % OTHER ___	% NATURAL ___	% CRUSHED ___	
AGENCY LOT/SUBLOT:	TIME RECEIVED: 15:20	SAMPLE TYPE: ODOT PG	MBI PG	MISC	CHECK

SIEVE ANALYSIS ☐ X DRY T-27 ☐ WET T-11/27 ☐ QUICK SHAKE

SIEVE SIZE	SPEC LIMITS	MASS 1	MASS 2	TOTAL MASS	% RET	% PASS
3"	100	0		0	0	100
2"	75-85	291.1			1.6	98
1 1/2"	40-60	470.7			2.6	96
1"		7800.9			43.0	53
3/4"		4460.9			24.6	28
1/2"	10-25	2740.7			15.1	13
3/8"		1685.9			9.3	4
1/4"		269.3			1.5	2
#40	0-5	201.3			1.1	1
#200	0-5	91.1			0.5	0.7
PAN		108.1			0.6	

FRACTURED PIECES TM 213

ACC. RET	TEST MASS	FRAC MASS	1FACE%	2FACE%	SPECS

ELONGATED PIECES

TEST MASS	ELONG MASS	FLAT MASS

MOISTURE = ((A - B) / (B - T)) x 100	SUM OF SIEVES (F) = 18120.0	FM TM 771		SE T 176	REMARKS:
WET AGG + PAN A =	INITIAL DRY WT (G) = 18140.6	D & C TM 226		1	Gilson TS-2 Shaker
DRY AGG + PAN B =	POST WASH WT (H) =	ELONG. TM 229		2	
PAN TARE T =	WASH LOSS (I) (G - H) =	WOOD TM 225		3	
MOISTURE =	WASH LOSS % (I / G) x 100 =	2.00mm / 6.3mm		AVG.	
OTHER:	ERROR RATE % ((H - F) / H) x 100 = 0.11%	CLEAN TM 227		OTHER:	Revision Date: 12/04/97

MBI DEER ISLAND
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07/12/2004 17:13
PAGE 02
JUL-12-2004 17:02
P.02
96%

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SUBMITTAL 02410-2

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MB

☐ Albany (541) 926-2541 ☐ Corvallis (541) 752-4420 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0111 ☐ Stayton (503) 769-6465
☐ Angel Quarry (503) 286-4201 ☐ Deer Island (503) 397-4659 ☐ Salem (503) 390-6965 ☐ Sundial (503) 491-4423
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6600 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Sherwood (503) 692-8242
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST
- gals. to full load
- gals. to ⅔ load
- gals. to ⅓ load

TEST CYL. TAKEN
- ☐ YES
- ☐ YES
- ☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS. Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST #
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGE WATER
DELIVERY POINT

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

REASON FOR DELAY TIME:
- ☐ JOB NOT READY
- ☐ LACK OF HELP
- ☐ WHEEL BARROW JOB
- ☐ WAITING FOR TRUCK TO UNLOAD
- ☐ ADDING WATER
- ☐ ARRIVED JOB EARLY
- ☐ OTHER

DATE 8/8/05 P.O. #
TIME 14:24 PLANT 242110 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER HEIDI
NET 0 lb

WATER REQUESTED BY:

SPECIAL INSTRUCTIONS:

CUSTOMER TICKET
DELIVERY SLIP

MATERIAL	MIX DESIGN	SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

Load Count Accum. Qty
JOB: 2 1,330.00 Ton 1,206.56 Mg
DESTINATION:

TRIM WATER GAL./YD.
WATER/CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	630.00	Ton		
	DELIVERED TO ZONE 999				
	99998 CITY OF PORTLAND				

TERMS: NET - CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL
TICKET # 1922716

RECEIVED BY
Initials of Acknowledger

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement concrete.

FORM 30 Revised 10/04

1922716

Administrative Group (541) 926-6491 • 32260 Old Hwy 34, Tang[illegible] 97389
ALSO SERVING YOU AT: Harrisburg Prestress (541) 995-6327 • Tangent Op[illegible]ns (541) 926-6491

COB# 2101

1

MBI

☐ Albany (541) 928-2547 ☐ Corvallis (541) 752-3428 ☐ Hardrock (541) 745-7672 ☐ [illegible]
☐ Angell Quarry (503) 286-4201 ☐ Deer Island (503) 397-4659 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0111 ☐ Stayton (503) 769-6465
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6600 ☐ Salem (503) 390-6955 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Sherwood (503) 692-6242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST
gals. to full load
gals. to ⅔ load
gals. to ⅓ load

TEST CYL. TAKEN
☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:
☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST #
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGE WATER
DELIVERY POINT
DATE 8/8/05 RO #
TIME 14:23 PLANT 242110 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER HEIDI
NET 0 lb

SPECIAL INSTRUCTIONS:

CUSTOMER TICKET
DELIVERY SLIP

MATERIAL	MIX DESIGN SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

Load Count Accum. Qty
JOB: 1 700.00 Ton 635.03 Mg
DESTINATION:

TRIM WATER GAL./YD.
WATER/CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	700.00	Ton		
	DELIVERED TO ZONE 999				
	99998 CITY OF PORTLAND				

TERMS: NET - CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month or a minimum of $1.00 will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL
TICKET # 1922715

RECEIVED BY

Initials of Acknowledger

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take respons[illegible]y for the warning in the product label regarding working with Portland Cement concrete.

FORM 30 Revised 10/04

1922715

CCB# 2101

Administrative Group (541) 928-6491 • 32260 Old Hwy 34, Ta[illegible] OR 97389
ALSO SERVING YOU AT: Harrisburg Prestress (541) 995-6327 • Tangent L[illegible]ions (541) 928-6491

(2)

☐ Albany (541) 928-2647 ☐ Corvallis (541) 752-3428 ☐ Hardrock (541) 745-7572 ☐ Reichhold (503) 366-5900 ☐ Springfield (541) 747-1213
☐ Angell Quarry (503) 286-4201 ☐ Deer Island (503) 397-4659 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0111 ☐ Stayton (503) 769-6465
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6600 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-8955 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST
_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load

TEST CYL. TAKEN
☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:
☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST # [redacted]
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
DELIVERY POINT 6900 N EDGE WATER
[redacted]
DATE 8/11/05 P.O. #
TIME 11:53 PLANT PIT
DRIVER 242110 0
GROSS TRUCK # TRLR #
TARE 0 lb WEIGHMASTER BARGE
NET 0 lb SONJA
0 lb
SPECIAL INSTRUCTIONS:

CUSTOMER TICKET

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

Load Count Accum. Qty
========= ==========
JOB: 1 780.00 Ton 707.60 Mg
DESTINATION:

TRIM WATER GAL./YD.
WATER/CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	780.00	Ton		
	DELIVERED TO ZONE 999				
	99998 CITY OF PORTLAND				

TERMS: NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL
TICKET #

RECEIVED BY
Initials of Acknowledger

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement co[redacted]e.

2038409
FORM 30 Revised 10/04
2038408

Administrative Group (541) 928-6491 • 32260 Old H[redacted] Tangent, OR 97389
ALSO SERVING YOU AT: Harrisburg Prestress (541) 995-6327 • Tangent Operations (541) 928-6491

CCB# 21[redacted]

(3)

☐ Albany (541) 928-6491 ☐ Dallas (541) 623-6146 ☐ Hardbrook (541) 746-7572 ☐ Springfield (541) 747-1213
☐ Angell Quarry (503) 288-4201 ☐ Deer Island (503) 397-4688 ☐ Hillsboro - Best Mix ☐ Rebhhold (503) 366-5900 ☐ Stayton (503) 769-6466
☐ Brownsville (541) 466-5888 ☐ Eugene (541) 689-6600 ☐ Lake Oswego (503) 548-3101 ☐ St. Helens (503) 397-0111 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5575 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-8955 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ¾ load
_____ gals. to ½ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS. Additional unloading time charged at current hourly truck rate.

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:

☒ JOB NOT READY
☒ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☒ OTHER

CUSTOMER ACCOUNT # 70096 CODE
JOB # 16889 BID #
DEST # [redacted]
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
DELIVERY POINT 6900 N EDGE WATER
[redacted]
DATE 8/11/05 PO #
TIME 11:54 PLANT PIT
DRIVER 242110 0
GROSS TRUCK # TRLR #
TARE 0 lb WEIGHMASTER
NET 0 lb SONJA
SPECIAL INSTRUCTIONS

CUSTOMER TICKET

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	2	1,465.00 Ton	1,329.03 Mg
DESTINATION:			

TRIM WATER GAL./YD.
WATER/ CEMENT RATIO
MAXIMUM ADD. WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	685.00	Ton		
	DELIVERED TO ZONE 999				
	BASE CITY OF PORTLAND				

TERMS: NET - CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL

TICKET # 2038410

RECEIVED BY

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement concrete.

Initials of Acknowledger

FORM 30 Revised 10/04

2038409

Administrative Group (541) 928-6491 • 32260 Old H[illegible] Tangent, OR 97389
ALSO SERVING YOU AT: Harrisburg Prestress (541) 995-6327 • Tangent Operations (541) 928-6491

CCB# 21[illegible]

(4)

☐ Albany (541) 928-2547 ☐ Corvallis (541) 752-3428 ☐ Hardrock (541) 745-7572 ☐ Reichhold (503) 366-5900 ☐ Springfield (541) 747-1213
☐ Angell Quarry (503) 286-4201 ☐ Deer Island (503) 397-4669 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0111 ☐ Stayton (503) 769-6465
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6600 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-6955 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST # 1
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGE WATER LOADED 8/16/05
DELIVERY POINT

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:
☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

DATE 8/17/05 P.O. #
TIME 13:55 PLANT 242110 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER HEIDI
NET 0 lb

SPECIAL INSTRUCTIONS:

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	1	721.00 Ton	654.08 Mg
DESTINATION:	1	721.00 Ton	654.08 Mg

TRIM WATER GAL./YD.
WATER/ CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	721.00	Ton		
	DELIVERED TO ZONE 999				
	99998 CITY OF PORTLAND				

TERMS: NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL
TICKET # 2038940

RECEIVED BY

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement concrete.

Initials of Acknowledger

FORM 30 Revised 10/04
2038940

CCB# 21[illegible]

Administrative Group (541) 928-6491 • 32260 Old H[illegible], Tangent, OR 97389
ALSO SERVING YOU AT Harrisburg Prestress (541) 995-6327 • Tangent Operations (541) 928-6491

5

MBI

☐ Angell Quarry (503) 289-4201 ☐ Deer Island (503) 397-4659 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0111 ☐ Stayton (503) 769-6405
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6600 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-6955 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 668-5577 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load.

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST # 1
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGE WATER LOADED 8/16/05
DELIVERY POINT

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:

☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

DATE 8/17/05 P.O. #
TIME 13:55 PLANT 242110 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER HEIDI
NET 0 lb

SPECIAL INSTRUCTIONS:

DELIVERY SLIP

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	2	1,662.00 Ton	1,507.74 Mg
DESTINATION:	2	1,662.00 Ton	1,507.74 Mg

TRIM WATER GAL./YD.

WATER/ CEMENT RATIO

MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	941.00	Ton		
	DELIVERED TO ZONE 999				
	99998 CITY OF PORTLAND				

TERMS: NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL

TICKET # 2038941

RECEIVED BY

Initials of Acknowledger

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement concrete.

FORM 30 Revised 10/04

2038941

CCB# 21(

Administrative Group (541) 928-6491 • 32260 Old Hw[illegible] ngent, OR 97389
ALSO SERVING YOU AT Harrisburg Prestress (541) 995-6327 • [illegible] t Operations (541) 928-6491

6

MBI

☐ Angell Quarry (503) 286-4201 ☐ Deer Island (503) 397-4659 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0111 ☐ Stayton (503) 769-6465
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6800 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-6955 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7672 ☐ Gresham (503) 666-5677 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 14687 CODE
JOB # 16026 BID #
DEST #
SOLD TO MBI SUNDIAL AGGREGATE
BARGE MATERIAL 2005
DELIVERY POINT SUNDIAL PLANT

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:

☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

DATE 8/19/05 P.O. #
TIME 11:47 PLANT 242110 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER SONJA
NET 0 lb

SPECIAL INSTRUCTIONS:

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

Load Count Accum. Qty
JOB: 1 931.00 Ton 844.59 Mg
DESTINATION:

TRIM WATER GAL./YD.
WATER/ CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	931.00	Ton		
	PLANT PICKUP				
	99999 OREGON (NO TAX)				

TERMS: NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL

TICKET # 2039166

RECEIVED BY

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement concrete.

Initials of Acknowledger

FORM 30 Revised 10/04

2039166

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CCB# 2101

Administrative Group (541) 928-6491 • 32260 Old Hwy 34, Tangent 97389
ALSO SERVING YOU AT Harrisburg Prestress (541) 995-6327 • Tangent Oper. (541) 928-6491

MBI

☐ Angell Quarry (503) 286-4201 ☐ Brownsville (541) 466-5899 ☐ Coffin Butte (541) 745-7572
☐ Deer Island (503) 397-4659 ☐ Eugene (541) 689-6600 ☐ Gresham (503) 666-5577
☐ Hillsboro - Best Mix (503) 648-3101 ☐ Lebanon Dispatcher (541) 258-7123
☐ St. Helens (503) 397-0111 ☐ Salem (503) 390-6955 ☐ Sherwood (503) 692-8242
☐ Stayton (503) 769-6465 ☐ Sundial (503) 401-4423

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST # 1
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
DELIVERY POINT 6900 N EDGE WATER LOADED 8/19/05

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:

☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

DATE 8/19/05 P.O. #
TIME 09:07 PLANT 242110 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER SONJA
NET 0 lb

SPECIAL INSTRUCTIONS:

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	1	731.00 Ton	663.15 Mg
DESTINATION:	1	731.00 Ton	663.15 Mg

TRIM WATER GAL./YD.
WATER/CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND	731.00	Ton		
	DELIVERED TO ZONE 999				
	99998 CITY OF PORTLAND				

TERMS: NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of **1½%** per month, or a minimum of **$1.00**, will be made on the unpaid balance at the end of the following month's billing cycle. This is an **ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE:** We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL

TICKET # 2039133

RECEIVED BY

Initials of Acknowledger

FORM 30 Revised 10/04

2039133

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement concrete.

CCB# 21[illegible]

Administrative Group (541) 928-6491 • 32260 Old H[illegible], Tangent, OR 97389
ALSO SERVING YOU AT Harrisburg Prestress (541) 995-6327 • Tangent Operations (541) 928-6491

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☐ Albany (541) 928-2547 ☐ Corvallis (541) 752-3429 ☐ Hardrock (541) 745-7572 ☐ Reichhold (503) 368-5900 ☐ Springfield (541) 747-1213
☐ Angell Quarry (503) 288-4201 ☐ Deer Island (503) 397-4669 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0111 ☐ Clayton (503) 799-6465
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-8600 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-6956 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load ☐ YES
_____ gals. to ⅔ load ☐ YES
_____ gals. to ½ load ☐ YES

TEST CYL. TAKEN

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS. Additional unloading time charged at current hourly truck rate.

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:
☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST #
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGE WATER
DELIVERY POINT
DATE 8/25/05 P.O. #
TIME 10:38 PLANT 241610 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER LINDA
NET 0 lb

SPECIAL INSTRUCTIONS:

CUSTOMER TICKET

DELIVERY SLIP

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	1	671.00 Ton	608.72 Mg
DESTINATION:			

TRIM WATER GAL./YD.

WATER/ CEMENT RATIO

MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
6C	6" COBBLE ROCK	671.00	Ton		
	DELIVERED TO ZONE 999				
	99999 CITY OF PORTLAND				

TERMS: NET = CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

RECEIVED BY

TOTAL

TICKET # 1858328

FORM 30 Revised 10/04

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement conc[illegible]

Initials of Acknowledger

1858328

CCB# 21L

Administrative Group (541) 928-6491 • 32260 Old Hw[illegible]angent, OR 97389
ALSO SERVING YOU AT Harrisburg Prestress (541) 995-6327 • Tangent Operations (541) 928-6491

#9-1

MBI

☐ Angell Quarry (503) 286-4201 ☐ Deer Island (503) 397-4659 ☐ Hillsboro Mix (503) 64 ☐ St. Helens (503) 397-0111 ☐ Clayton (503) 769-6465
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6500 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-8956 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS. Additional unloading time charged at current hourly truck rate.

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

WATER REQUESTED BY:

REASON FOR DELAY TIME:

☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST #
SOLD TO ADVANCED TAMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGE WATER
DELIVERY POINT
DATE 8/25/05 P.O. #
TIME 10:43 PLANT 241610 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER LINDA
NET 0 lb

SPECIAL INSTRUCTIONS:

CUSTOMER TICKET
DELIVERY SLIP

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	1	111.00 Ton	100.70 Mg
DESTINATION:			

TRIM WATER GAL./YD.
WATER/ CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
21212	2 1/2"-1/2" CRUSHED ROCK	111.00	Ton		
	DELIVERED TO ZONE 999				
	99998 CITY OF PORTLAND				

TERMS: NET - CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES DUE AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge of 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at the end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF 18%. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material furnished on this job according to OREGON REVISED STATUTE 87.021.

RECEIVED BY

TOTAL

TICKET # 1858329

FORM 30 Revised 10/04

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand and take responsibility for the warning in the product label regarding working with Portland Cement concrete.

Initials of Acknowledger

CCB# 2101

Administrative Group (541) 928-6491 • 32260 Old Hwy 34, Tangent, OR 97389
ALSO SERVING YOU AT Harrisburg Prestress (541) 995-6327 • Tangent Operations (541) 928-6491

1858329

#9-2

Westside Rock
Rip Rap - McCormick & Baxter
Sediment Cap Completion

Report Date: 08/24/2005

From 08/24/2005 to 08/24/2005
Commodity Out

Ticket #	Date	Time In	Company ID	Vehicle ID	Material	Location	Oper	Gross	Tare	Net	Units	Unit Name	Unit Price	Net Price	Tax	Total Price	Chg
Job: BUILDSRRAP																	
7755	8/24/2005	0:49:58	AAD	TRITON	RIPRAP		SH	43480	22900	20580	10.29	TONS	.00	$0.00	$.00	$.00	Y
7756	8/24/2005	0:49:56	AAD	RICHARDS2	RIPRAP		SH	40880	22040	18840	9.42	TONS	.00	$0.00	$.00	$.00	Y
7757	8/24/2005	1:10:09	AAD	TRITON	RIPRAP		SH	49760	22900	26860	13.43	TONS	.00	$0.00	$.00	$.00	Y
7758	8/24/2005	1:10:45	AAD	STAR	RIPRAP		SH	51620	25420	26200	13.10	TONS	.00	$0.00	$.00	$.00	Y
7759	8/24/2005	1:18:47	AAD	RICHARDS2	RIPRAP		SH	40840	22040	18800	9.40	TONS	.00	$0.00	$.00	$.00	Y
7760	8/24/2005	1:24:14	AAD	TRITON	RIPRAP		SH	45480	22900	22580	11.29	TONS	.00	$0.00	$.00	$.00	Y
7761	8/24/2005	1:30:44	AAD	STAR	RIPRAP		SH	52140	25420	26720	13.36	TONS	.00	$0.00	$.00	$.00	Y
7762	8/24/2005	1:45:31	AAD	RICHARDS2	RIPRAP		SH	42400	22040	20360	10.18	TONS	.00	$0.00	$.00	$.00	Y
7763	8/24/2005	1:51:47	AAD	TRITON	RIPRAP		SH	48920	22900	26020	13.01	TONS	.00	$0.00	$.00	$.00	Y
7764	8/24/2005	1:57:04	AAD	STAR	RIPRAP		SH	57260	25420	31840	15.92	TONS	.00	$0.00	$.00	$.00	Y
7765	8/24/2005	2:08:23	AAD	RICHARDS2	RIPRAP		SH	43380	22040	21340	10.67	TONS	.00	$0.00	$.00	$.00	Y
7767	8/24/2005	2:15:55	AAD	TRITON	RIPRAP		SH	51380	22900	28480	14.24	TONS	.00	$0.00	$.00	$.00	Y
7768	8/24/2005	2:19:15	AAD	STAR	RIPRAP		SH	57160	25420	31740	15.87	TONS	.00	$0.00	$.00	$.00	Y
7769	8/24/2005	2:32:50	AAD	RICHARDS2	RIPRAP		SH	45020	22040	22980	11.49	TONS	.00	$0.00	$.00	$.00	Y
7770	8/24/2005	2:36:56	AAD	TRITON	RIPRAP		SH	51900	22900	29000	14.50	TONS	.00	$0.00	$.00	$.00	Y
7771	8/24/2005	2:42:45	AAD	STAR	RIPRAP		SH	58220	25420	32800	16.40	TONS	.00	$0.00	$.00	$.00	Y
7772	8/24/2005	2:57:33	AAD	RICHARDS2	RIPRAP		SH	42460	22040	20440	10.22	TONS	.00	$0.00	$.00	$.00	Y
7773	8/24/2005	1:01:36	AAD	TRITON	RIPRAP		SH	52300	22900	29400	14.70	TONS	.00	$0.00	$.00	$.00	Y
7774	8/24/2005	1:05:05	AAD	STAR	RIPRAP		SH	61260	25420	35840	17.92	TONS	.00	$0.00	$.00	$.00	Y
7775	8/24/2005	1:24:33	AAD	RICHARDS2	RIPRAP		SH	45420	22040	23380	11.69	TONS	.00	$0.00	$.00	$.00	Y
7776	8/24/2005	1:24:45	AAD	TRITON	RIPRAP		SH	53540	22900	30640	15.32	TONS	.00	$0.00	$.00	$.00	Y
7777	8/24/2005	1:33:39	AAD	STAR	RIPRAP		SH	62420	25420	37000	18.50	TONS	.00	$0.00	$.00	$.00	Y
7778	8/24/2005	1:46:43	AAD	RICHARDS2	RIPRAP		SH	45260	22040	23240	11.62	TONS	.00	$0.00	$.00	$.00	Y
7779	8/24/2005	1:51:04	AAD	TRITON	RIPRAP		SH	52360	22900	29460	14.73	TONS	.00	$0.00	$.00	$.00	Y
7781	8/24/2005	2:08:56	AAD	STAR	RIPRAP		SH	64320	25420	38900	19.45	TONS	.00	$0.00	$.00	$.00	Y
7782	8/24/2005	2:10:30	AAD	RICHARDS2	RIPRAP		SH	48180	22040	26140	13.07	TONS	.00	$0.00	$.00	$.00	Y
7783	8/24/2005	2:18:48	AAD	TRITON	RIPRAP		SH	54060	22900	31160	15.58	TONS	.00	$0.00	$.00	$.00	Y
7784	8/24/2005	2:28:00	AAD	STAR	RIPRAP		SH	62320	25420	36900	18.45	TONS	.00	$0.00	$.00	$.00	Y
7785	8/24/2005	2:39:58	AAD	RICHARDS2	RIPRAP		SH	45480	22040	23440	11.72	TONS	.00	$0.00	$.00	$.00	Y
7786	8/24/2005	2:42:19	AAD	TRITON	RIPRAP		SH	55840	22900	32940	16.47	TONS	.00	$0.00	$.00	$.00	Y
7787	8/24/2005	3:00:22	AAD	STAR	RIPRAP		SH	59140	25420	33720	16.86	TONS	.00	$0.00	$.00	$.00	Y
7788	8/24/2005	3:02:10	AAD	RICHARDS2	RIPRAP		SH	46260	22040	24220	12.11	TONS	.00	$0.00	$.00	$.00	Y
7789	8/24/2005	3:12:50	AAD	TRITON	RIPRAP		SH	52500	22900	29600	14.80	TONS	.00	$0.00	$.00	$.00	Y
7791	8/24/2005	3:30:11	AAD	STAR	RIPRAP		SH	58320	25420	32900	16.45	TONS	.00	$0.00	$.00	$.00	Y
7792	8/24/2005	3:33:54	AAD	RICHARDS2	RIPRAP		SH	47220	22040	25180	12.59	TONS	.00	$0.00	$.00	$.00	Y
7793	8/24/2005	3:37:12	AAD	TRITON	RIPRAP		SH	53200	22900	30300	15.15	TONS	.00	$0.00	$.00	$.00	Y
7794	8/24/2005	3:48:43	AAD	STAR	RIPRAP		SH	61280	25420	35860	17.93	TONS	.00	$0.00	$.00	$.00	Y
7795	8/24/2005	3:54:44	AAD	RICHARDS2	RIPRAP		SH	47780	22040	25740	12.87	TONS	.00	$0.00	$.00	$.00	Y
7796	8/24/2005	3:59:51	AAD	TRITON	RIPRAP		SH	52600	22900	29700	14.85	TONS	.00	$0.00	$.00	$.00	Y
7797	8/24/2005	4:15:48	AAD	STAR	RIPRAP		SH	65820	25420	40400	20.20	TONS	.00	$0.00	$.00	$.00	Y
7798	8/24/2005	4:19:26	AAD	RICHARDS2	RIPRAP		SH	46900	22040	24860	12.43	TONS	.00	$0.00	$.00	$.00	Y
7799	8/24/2005	4:24:01	AAD	TRITON	RIPRAP		SH	54840	22900	31940	15.97	TONS	.00	$0.00	$.00	$.00	Y

10

From 08/24/2005 to 08/24/2005

Commodity Out

Report Date: 08/24/2005

Ticket #	Date	Time In	Company ID	Vehicle ID	Material	Location	Oper	Gross	Tare	Net	Units	Unit Name	Unit Price	Net Price	Tax	Total Price	Chg
7801	8/24/2005	4:48:04	APD	STAR	RIPRAP		SH	59420	25420	34000	17.00	TONS	.00	$0.00	$.00	$.00	Y
Total Tickets: 43								2229380	1007940	1221440				$0.00	$0.00	$0.00	
Total Net Wt/Tons: 610.72																	
Grand Total Tickets: 43								2229380	1007940	1221440				$0.00	$0.00	$0.00	
Grand Total Net Wt/Tons: 610.72																	

Total Tons
Rip Rap

MBI

☐ Albany (541) 928-2547 ☐ Corvallis (541) 752-3426 ☐ Hardrock (541) 745-7572 ☐ Reichhold (503) 366-5900 ☐ Springfield (541) 747-1213
☐ Angell Quarry (503) 286-4206 ☐ Deer Island (503) 397-4659 ☐ Hillsboro - Best Mix (503) 648-3106 ☐ St. Helens (503) 397-0111 ☐ Stayton (503) 769-6485
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 699-6600 ☐ Salem (503) 390-6955 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Sherwood (503) 692-8242

MAP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST #
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
DELIVERY POINT 6900 N EDGEWATER

ORIGINAL TICKET

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

REASON FOR DELAY TIME:

☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

DATE 8/30/05 P.O. #
TIME 15:28 PLANT PIT
DRIVER 242110 0
GROSS TRUCK # TRLR #
TARE 0 lb WEIGHMASTER BARGE
NET 0 lb HEIDI
0 lb

WATER REQUESTED BY:

SPECIAL INSTRUCTIONS:

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

Load Count Accum. Qty
======== ==========
JOB: 1 597.00 Ton 541.59 Mg
DESTINATION:

TRIM WATER GAL./YD.
WATER/ CEMENT RATIO
MAXIMUM ADD WATER GALS.

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
PORTSAND	PORT OF SH DREDGE SAND DELIVERED TO ZONE 999 99998 CITY OF PORTLAND	597.00	Ton		

IMS: NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES E AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge ½% per month, or a minimum of $1.00, will be made on the unpaid balance at end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF %. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material ished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL
TICKET # 2040335

RECEIVED BY

FORM 30 Revised 10/04

portant: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand d take responsibility for the warning in the product label regarding working with Portland Cement concrete.

Initials of Acknowledger

2040335

Administrative Group (541) 928-6491 • 32250 Old Hwy 34, Tang... OR 97389
ALSO SERVING YOU AT ...

IB# 2101

#11-1

08/31/2005 08:40 5033665903 MBI WATERVIEW PAGE 01

1105-533

1105-533

2nd Barge of Cobble

MBI

☐ Angell Quarry (503) 266-4201 ☐ Cobb Island (503) 367-4039 ☐ Hillsboro - East Mix (503) 648-3101 ☐ St. Helens (503) 397-3111 ☐ Clayton (503) 163-6400
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-8600 ☐ Salem (503) 390-6955 ☐ Sundial (503) 491-4423
☐ Coffin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Sherwood (503) 692-6242

AP LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT CUSTOMER'S REQUEST

_____ gals. to full load
_____ gals. to ⅔ load
_____ gals. to ⅓ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16589 BID #
DEST # 1
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGEWATER
DELIVERY POINT DELIVERED 8/30/05

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

REASON FOR DELAY TIME:

☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

DATE 8/31/05 P.O. #
TIME 08:46 PLANT 241610 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER LINDA
NET 0 lb

WATER REQUESTED BY:

SPECIAL INSTRUCTIONS:

MATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	1	909.00 Ton	824.63 Mg
DESTINATION:	1	909.00 Ton	824.63 Mg

TRIM WATER G

WATER/ CEMENT RATIO

MAXIMUM ADD WATER

PRODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUN
6C	6" COBBLE ROCK	909.00	Ton		
	DELIVERED TO ZONE 999 99998 CITY OF PORTLAND	109 →	barge	#11	
		+ 800 →	barge	#12	
		909			

#11-2 & 12

TOTAL P.01

RMS: NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES E AND PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge 1½% per month, or a minimum of $1.00, will be made on the unpaid balance at end of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF %. PERSONAL NOTICE: We reserve the right to claim lien for all labor and material nished on this job according to OREGON REVISED STATUTE 87.021.

TOTAL

TICKET # 185

RECEIVED BY

FORM 30 Revised 10/04

Important: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand nd take responsibility for the warning in the product label regarding working with Portland Cement concrete.

Initials of Acknowledger

CB# 2101

Administrative Group (541) 928-6491 • 32250 Old Hwy 34, Tangent, OR 97389
ALSO [illegible]NG YOU AT Harrisburg Business (541) 995-6327 • Tangent Operations (541) 928-6491

1858479

P.01

TOTAL P.01

☐ Albany (541) 928-2547 ☐ Corvallis (541) 752-3428 ☐ Hardrock (541) 745-7572 ☐ Reichhold (503) 366-5900 ☐ Springfield (541) 747-1213
☐ Angell Quarry (503) 296-4201 ☐ Cedar Island (503) 397-4669 ☐ Hillsboro - Best Mix (503) 648-3101 ☐ St. Helens (503) 397-0117 ☐ Stayton (503) 769-6466
☐ Brownsville (541) 466-5899 ☐ Eugene (541) 689-6600 ☐ Lebanon Dispatcher (541) 258-7123 ☐ Salem (503) 390-6955 ☐ Sundial (503) 491-4423
☐ Collin Butte (541) 745-7572 ☐ Gresham (503) 666-5577 ☐ Shorwood (503) 692-8242

LOCATE	BATCH TIME	LEAVE PLANT	ARRIVE JOB	BEGIN POUR	FINISH POUR	LEAVE JOB	ARRIVE PLANT

WATER ADDED AT STOMER'S REQUEST

____ gals. to full load
____ gals. to ⅔ load
____ gals. to ⅓ load

TEST CYL. TAKEN

☐ YES
☐ YES
☐ YES

6 MINUTES PER YARD FREE UNLOADING TIME ALLOWED ON FULL LOADS.
Additional unloading time charged at current hourly truck rate.

CUSTOMER ACCOUNT # 30096 CODE
JOB # 16889 BID #
DEST # 1
SOLD TO ADVANCED AMER DIVING SERV INC
MCCORMICK BAXTER UPLAND
6900 N EDGEWATER
DELIVERY POINT DELIVERED 9/1/05

DATE 9/1/05 P.O. #
TIME 15:00 PLANT 241610 PIT 0
DRIVER
GROSS 0 lb TRUCK # BARGE TRLR #
TARE 0 lb WEIGHMASTER LINDA
NET 0 lb

ADDITIONAL WATER ADDED TO THIS NCRETE WILL REDUCE STRENGTH. ANY WATER ADDED IS AT CUSTOMER'S OWN RISK.

REASON FOR DELAY TIME:

☐ JOB NOT READY
☐ LACK OF HELP
☐ WHEEL BARROW JOB
☐ WAITING FOR TRUCK TO UNLOAD
☐ ADDING WATER
☐ ARRIVED JOB EARLY
☐ OTHER

ATER REQUESTED BY:

SPECIAL INSTRUCTIONS:

ATERIAL	MIX DESIGN, SSD	MOISTURE CORRECTION	DESIRED AMOUNT	ACTUAL AMOUNT	SSD CORRECTED AMOUNT

	Load Count	Accum. Qty	
JOB:	1	892.00 Ton	809.21 Mg
DESTINATION:	1	892.00 Ton	809.21 Mg

TRIM WATER GAL/
WATER/ CEMENT RATIO
MAXIMUM ADD WATER GA

ODUCT #	PRODUCT DESCRIPTION	QUANTITY	UNITS	UNIT PRICE	AMOUNT
6C	6" COBBLE ROCK DELIVERED TO ZONE 999 99998 CITY OF PORTLAND	892.00	Ton		

NET – CASH SALES PAYABLE UPON PICKUP OR DELIVERY. CHARGE SALES D PAYABLE BY THE 15TH OF MONTH FOLLOWING PURCHASE. A service charge % per month, or a minimum of $1.00, will be made on the unpaid balance at of the following month's billing cycle. This is an ANNUAL PERCENTAGE RATE OF PERSONAL NOTICE: We reserve the right to claim lien for all labor and material l on this job according to OREGON REVISED STATUTE 87.021.

RECEIVED BY

TOTAL
TICKET # 185860

ant: I acknowledge receipt of a copy of Morse Bros., Inc.'s Ready Mix concrete product label, and I understand ku responsibility fo warning in the product label regarding working with Portland Cement concrete.

itials of Acknowledger

FORM 30 Revised 10/04

1858608

Administrative Group (541) 926-6491 | 32260 Old Hwy 34, Tangent, OR 9

2101

JAN-24-1900 00:53

13

RECEIVED

SEP 1 5 2005

From 09/06/2005 to 09/06/2005

Commodity Out

Report Date: 09/06/2005

Job: BUILDSRRAP

Ticket #	Date	Time In	Company ID	Vehicle ID	Material	Location	Oper	Gross	Tare	Net	Units	Unit Name	Unit Price	Net Price	Tax	Total Price	Cl
7977	9/6/2005	7:26:54	PAD	GREER	RIPRAP		SH	47020	22760	24260	12.13	TONS	.00	$0.00	$.00	$.00	Y
7978	9/6/2005	8:01:29	PAD	RICHARDS2	RIPRAP		SH	44380	22040	22340	11.17	TONS	.00	$0.00	$.00	$.00	Y
7979	9/6/2005	8:08:07	PAD	TRITON	RIPRAP		SH	52920	22900	30020	15.01	TONS	.00	$0.00	$.00	$.00	Y
7980	9/6/2005	8:13:24	PAD	GREER	RIPRAP		SH	49380	22760	26620	13.31	TONS	.00	$0.00	$.00	$.00	Y
7981	9/6/2005	8:30:51	PAD	RICHARDS2	RIPRAP		SH	47000	22040	24960	12.48	TONS	.00	$0.00	$.00	$.00	Y
7982	9/6/2005	8:33:09	PAD	TRITON	RIPRAP		SH	54760	22900	31860	15.93	TONS	.00	$0.00	$.00	$.00	Y
7983	9/6/2005	8:38:46	PAD	GREER	RIPRAP		SH	47180	22760	24420	12.21	TONS	.00	$0.00	$.00	$.00	Y
7984	9/6/2005	8:45:18	PAD	STAR	RIPRAP		SH	59360	25420	33940	16.97	TONS	.00	$0.00	$.00	$.00	Y
7985	9/6/2005	8:56:50	PAD	RICHARDS2	RIPRAP		SH	45300	22040	23260	11.63	TONS	.00	$0.00	$.00	$.00	Y
7986	9/6/2005	9:03:29	PAD	TRITON	RIPRAP		SH	54980	22900	32080	16.04	TONS	.00	$0.00	$.00	$.00	Y
7987	9/6/2005	9:05:55	PAD	GREER	RIPRAP		SH	47140	22760	24380	12.19	TONS	.00	$0.00	$.00	$.00	Y
7988	9/6/2005	9:13:52	PAD	STAR	RIPRAP		SH	54320	25420	28900	14.45	TONS	.00	$0.00	$.00	$.00	Y
7989	9/6/2005	9:26:27	PAD	TRITON	RIPRAP		SH	49900	22900	27000	13.50	TONS	.00	$0.00	$.00	$.00	Y
7990	9/6/2005	9:30:01	PAD	RICHARDS2	RIPRAP		SH	44000	22040	21960	10.98	TONS	.00	$0.00	$.00	$.00	Y
7991	9/6/2005	9:37:10	PAD	GREER	RIPRAP		SH	48040	22760	25280	12.64	TONS	.00	$0.00	$.00	$.00	Y
7992	9/6/2005	9:47:03	PAD	STAR	RIPRAP		SH	52520	25420	27100	13.55	TONS	.00	$0.00	$.00	$.00	Y
7993	9/6/2005	9:50:21	PAD	TRITON	RIPRAP		SH	47040	22900	24140	12.07	TONS	.00	$0.00	$.00	$.00	Y
7994	9/6/2005	9:55:26	PAD	RICHARDS2	RIPRAP		SH	41700	22040	19660	9.83	TONS	.00	$0.00	$.00	$.00	Y
7995	9/6/2005	0:03:18	PAD	GREER	RIPRAP		SH	46520	22760	23760	11.88	TONS	.00	$0.00	$.00	$.00	Y
7996	9/6/2005	0:09:32	PAD	STAR	RIPRAP		SH	54760	25420	29340	14.67	TONS	.00	$0.00	$.00	$.00	Y
7997	9/6/2005	0:17:42	PAD	TRITON	RIPRAP		SH	49420	22900	26520	13.26	TONS	.00	$0.00	$.00	$.00	Y
7999	9/6/2005	0:27:51	PAD	RICHARDS2	RIPRAP		SH	42140	22040	20100	10.05	TONS	.00	$0.00	$.00	$.00	Y
8000	9/6/2005	0:28:33	PAD	GREER	RIPRAP		SH	46520	22760	23760	11.88	TONS	.00	$0.00	$.00	$.00	Y
8001	9/6/2005	0:33:56	PAD	STAR	RIPRAP		SH	52280	25420	26860	13.43	TONS	.00	$0.00	$.00	$.00	Y
8004	9/6/2005	0:44:44	PAD	TRITON	RIPRAP		SH	49780	22900	26880	13.44	TONS	.00	$0.00	$.00	$.00	Y
8005	9/6/2005	0:55:31	PAD	RICHARDS2	RIPRAP		SH	44220	22040	22180	11.09	TONS	.00	$0.00	$.00	$.00	Y
8006	9/6/2005	0:55:53	PAD	GREER	RIPRAP		SH	44940	22760	22180	11.09	TONS	.00	$0.00	$.00	$.00	Y
8007	9/6/2005	1:00:03	PAD	STAR	RIPRAP		SH	53620	25420	28200	14.10	TONS	.00	$0.00	$.00	$.00	Y
8008	9/6/2005	1:07:42	PAD	TRITON	RIPRAP		SH	49220	22900	26320	13.16	TONS	.00	$0.00	$.00	$.00	Y
8011	9/6/2005	1:24:12	PAD	RICHARDS2	RIPRAP		SH	43960	22040	21920	10.96	TONS	.00	$0.00	$.00	$.00	Y
8012	9/6/2005	1:25:06	PAD	GREER	RIPRAP		SH	46360	22760	23600	11.80	TONS	.00	$0.00	$.00	$.00	Y
8013	9/6/2005	1:28:56	PAD	STAR	RIPRAP		SH	54040	25420	28620	14.31	TONS	.00	$0.00	$.00	$.00	Y
8014	9/6/2005	1:35:05	PAD	TRITON	RIPRAP		SH	48440	22900	25540	12.77	TONS	.00	$0.00	$.00	$.00	Y
8015	9/6/2005	1:48:08	PAD	RICHARDS2	RIPRAP		SH	44200	22040	22160	11.08	TONS	.00	$0.00	$.00	$.00	Y
8016	9/6/2005	1:48:48	PAD	GREER	RIPRAP		SH	48180	22760	25420	12.71	TONS	.00	$0.00	$.00	$.00	Y
8019	9/6/2005	1:59:51	PAD	STAR	RIPRAP		SH	57360	25420	31940	15.97	TONS	.00	$0.00	$.00	$.00	Y
8020	9/6/2005	2:01:43	PAD	TRITON	RIPRAP		SH	47380	22900	24480	12.24	TONS	.00	$0.00	$.00	$.00	Y
8021	9/6/2005	2:08:11	PAD	RICHARDS2	RIPRAP		SH	45700	22040	23660	11.83	TONS	.00	$0.00	$.00	$.00	Y
8022	9/6/2005	2:18:21	PAD	GREER	RIPRAP		SH	44200	22760	21440	10.72	TONS	.00	$0.00	$.00	$.00	Y
8023	9/6/2005	2:20:10	PAD	STAR	RIPRAP		SH	52000	25420	26580	13.29	TONS	.00	$0.00	$.00	$.00	Y
8026	9/6/2005	2:34:01	PAD	TRITON	RIPRAP		SH	51100	22900	28200	14.10	TONS	.00	$0.00	$.00	$.00	Y
8027	9/6/2005	2:34:48	PAD	RICHARDS2	RIPRAP		SH	44360	22040	22320	11.16	TONS	.00	$0.00	$.00	$.00	Y

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From 09/06/2005 to 09/06/2005

Commodity Out

Report Date: 09/06/2005

Ticket #	Date	Time In	Company ID	Vehicle ID	Material	Location	Oper	Gross	Tare	Net	Units	Unit Name	Unit Price	Net Price	Tax	Total Price	Gb
8028	9/6/2005	2:47:34	AAD	GREER	RIPRAP		SH	45500	22760	22740	11.37	TONS	.00	$0.00	$.00	$.00	Y
8029	9/6/2005	2:56:12	AAD	STAR	RIPRAP		SH	58080	25420	32660	16.33	TONS	.00	$0.00	$.00	$.00	Y
8030	9/6/2005	2:57:11	AAD	TRITON	RIPRAP		SH	48320	22900	25420	12.71	TONS	.00	$0.00	$.00	$.00	Y
8034	9/6/2005	1:09:46	AAD	RICHARDS2	RIPRAP		SH	45680	22040	23640	11.82	TONS	.00	$0.00	$.00	$.00	Y
8035	9/6/2005	1:10:42	AAD	GREER	RIPRAP		SH	46920	22760	24160	12.08	TONS	.00	$0.00	$.00	$.00	Y
Total Tickets: 47								2292140	1089960	1202180				$0.00	$0.00	$0.00	

Total Net Wb/Tons: 601.39

Note: This page intentionally left blank.

SUBMITTAL 02410-3

Note: This page intentionally left blank.

To: Advanced American
Diving

From: Westside Rock
Goble Quarry

attn: Jake

Here is our Scale
License

thanks
Scott

FORM 1014 REV 12/00
OREGON DEPARTMENT OF AGRICULTURE
635 CAPITOL STREET NE
SALEM OR 97301-2532
(503) 986-4550

POST THIS LICENSE IN A CONSPICUOUS PLACE

LICENSEE

WESTSIDE ROCK
2459 SE TV HWY, PMB #342
HILLSBORO, OR 97124

FIRM NO. 141969 170184
WESTSIDE ROCK
BUSINESS LOCATION GOBLE QUARRY
70075 NICOLAI
GOBLE, OR 97048

LICENSE TYPE	LICENSE NUMBER	DATE ISSUED	DATE EXPIRES		
026	173356	08/17/2005	06/30/2006	210.00	TOTAL DEVICES 1

Device License-Scale Type E over 60,000 lbs Capacity

MBI- WATTERS QUARRY

FACSIMILE TRANSMITTAL SHEET

TO: Jake

FROM: Linda MBI

COMPANY

DATE 9-14-05

FAX NUMBER 503. 650. 8230

TOTAL NO. OF PAGES INCLUDING COVER: 2

PHONE #

SENDERS REFERENCE NUMBER:
503.397.0111 503.397.1276 FAX

MESSAGE:

Department of Agriculture
Measurement Standards Division
635 Capitol Street NE
Salem, Oregon 97301-2532

HEAVY CAPACITY SCALE REPORT

Form 2033 Rev. 5/01

COL. | Retest

Date	Time	Duration
4-27-05	2 25 AM (PM)	1

License Status	Number Issued	Number Required	Number Tested
A	1-E	1-E	1-E

Firm Name: Moore Scale INC

Mailing Address: 22600 OLD HWY 34

City, State, Zip Code: Tangent OR 97389 — County # 22

Device Location: 60371 Columbia River Hwy

City, State, Zip Code: St Helens OR 97051 — County # 5

Firm Number: 91700 — License Number: 85624

Operator / Corporation Name:

Previous Firm Name:

Seasonal Months: _____ to _____

Phone Number: (503) 397-0111

Add Bell Dormant Other

DESCRIPTION OF EQUIPMENT

II-Sect. Scale: 2 3 / II / CENTER / I / 1 4

INDICATOR

Scale Capacity	120000	Beam Capacity	/
No. of Sections	7	Make	/
Section/CLC Capacity	50000	ID No.	/
Printer	YES	Min. Grad.	/

Dial Capacity	/	Digital Capacity	120000
Make	/	Make	Toledo
ID No.	/	ID No.	513486-5DC
Min. Grad.		Min. Incr.	20LB

VI-Sect. Scale: 6 VI 7 / 5 V 8 / 4 IV 9 / 3 III 10 / 2 II 11 / 1 I 12

VEHICLE LENGTH RESTRICTIONS Limited to Single Drafts up to: 40'

Platform Dimensions: 40' x 10'

Previous Test Date: 3-1-04

SCALE TEST DETERMINATIONS

Balance on Arrival: OK

Beam Sensitivity: Zero Load NA — Full Load NA

Load Pos'n	Test Weights	Indication	Error on Indication	Load Pos'n	Test Weights	Indication	Error on Indication	Load Pos'n	Test Weights	Indication	Error on Indication
I	13000	13000	Ø	I	25000	25020	+20	M	25000	25000	—
II		13000	Ø	M		25000	Ø	II		25000	—
III		13000	Ø	II		25000	Ø	M		25000	—
IV		13000	Ø	M		25000	Ø	IV		25000	Ø
V		13000	Ø	III		25000	Ø	M		25000	Ø
VI		13000	Ø	M		25000	Ø	VII		25020	+20
VII		13020	+20	IV		25020	+20		BAL	CHG	Ø

Shift Test

Load Pos'n	Indication	Load Pos'n	Indication	Load Pos'n	Indication
I	55140				
II	55140				
III	55140				
	BAL CHG	Ø			

Strain Load Test

Uncalibrated Strain Load	29940	
Test Weights Added to	25000	
Combined Load Indication	54940	
Error on Test Weights	Ø	BAL CHG
Load Applied to Section	I	Ø

Code References:

Remarks:

Action Taken:	Device Approved	Device Rejected	Days for Correction:	Repair Order Number:	Rejection Code: *
	☒	☐			

Department Representative: [signature]

Operator Copy Received By: Ruido Sieco

* REJECTION CODES ON REVERSE SIDE

For Information By Phone: SALEM (503) 986-4670 / FAX: (503) 986-4784 / TDD Hearing Impaired: (503) 986-4762

White Report = OFFICE, Yellow Report = OPERATOR, Pink Report = INSPECTOR

Page 2

F

Other Product Data

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MEMORANDUM: QUARRY VISITS – SEDIMENT CAP COMPLETION PROJECT

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PACRIM GEOTECHNICAL INC.
506 SW 6TH AVENUE, SUITE. 1006, PORTLAND, OR 97204

GEOTECHNICAL ENGINEERING
AND APPLIED EARTH SCIENCES

Date	August 25, 2005	**Project**	McCormick & Baxter
To	John Montgomery Ecology & Environment	**Subject**	Quarry Visits - Sediment Cap Completion Project
From	André D. Maré, P.E.		

MEMORANDUM

This memorandum presents the results of visual inspection of rock and sand products for the McCormick & Baxter Sediment Cap Completion project. PacRim was requested to visually inspect the products at the source prior to shipping to the site. Products inspected by PacRim include Gravel Filter, 6-Inch Minus Rock, Riprap, and Sand.

Goble Quarry

On August 1, 2005, I visited Westside Rock's Goble Quarry to view the proposed riprap materials. Present at the site was Don Lehman of Westside Rock. Don did not yet have materials sorted to the appropriate size, but was requesting pre-approval of the source material prior to sorting. I noted that the proposed material was hard, durable basalt and free of defects. I revisited the site on August 23, 2005. Sorting had been completed and the proposed rocks were stockpiled. Based on visual examination, the stockpile appears to have the correct distribution of rock sizes required by the Specifications. I recommend acceptance of the riprap.

Waterview Site

On August 1, 2005, I visited the Waterview Site owned by Morse Brothers. I was shown a stockpile of the proposed dredge sand. The sand was a uniform poorly graded material, generally fine to medium grained. The particles appeared to be angular to subrounded. Based on visual examination, the material appeared to meet the required grain size distribution which is simply 80% falling between the two U.S. Standard Sieve Sizes 10 and 100. We understand grain size distribution test results have been submitted that confirm conformance with the Specification. I recommend acceptance of the sand.

Watters Quarry

On August 23, 2005, I visited the Watters Quarry owned by Morse Brothers. Present at the site were Mike Johns of Advanced American Diving and a Morse Brothers representative. I was shown a stockpile of 6"-Minus Rock. The product consisted of hard, durable, angular basalt and/or andesite rock, and was free of defects. Based on visual examination, the material appeared to meet the required grain size distribution. We understand grain size distribution test results have been submitted that confirm conformance with the Specification. I recommend acceptance of the 6"-Minus Rock.

Also at the Watters Quarry, I was shown a stockpile of Gravel Filter material. The product consisted of hard, durable, angular basalt and/or andesite rock, and was free of defects. Based on visual examination, the material appeared to meet the required grain size distribution. We understand grain size distribution test results have been submitted that confirms conformance with the Specification. I recommend acceptance of the Gravel Filter.

I recommend the design team continue to perform ongoing inspections of rock and sand materials as the job progresses.

TECHNICAL MEMORANDUM: DESCRIPTION OF RECENT PLACEMENT OF ORGANOCLAY MAT AT M&B SITE OVER A BUBBLE CHANNEL THAT CARRIED CREOSOTE COATED ON THE BUBBLE TO THE SURFACE

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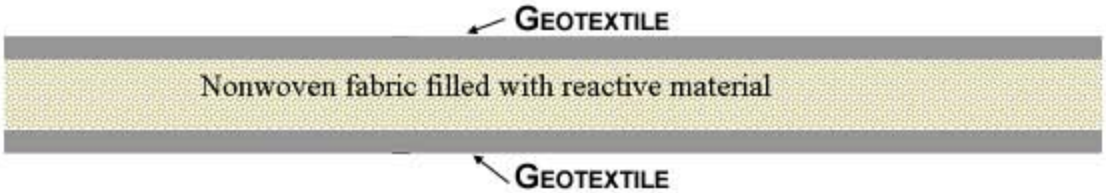
Description of Recent Placement of Organoclay Mat at M&B Site over a Bubble Channel that Carried Creosote Coated on the Bubble to the Surface

There is always bubbling at the site due to biologic activity within the sediments. Historically, many of these bubbles carried creosote to the water surface where they passed through areas with saturations of creosote in the sediment. With the emplacement of the sediment cap, although the bubbling still occurs (greatly increasing with low water levels and summer temperatures), there is no sheen observed in association with the bubbling.

The exception being last winter when we observed sheen associated with one bubble channel near the historic bulkhead to the west of the TFA organoclay placement area. This bubble induced sheen release became more pronounced last month when the river dropped to yearly low levels. Just west of the bubble is where we observed sheen during emplacing the sediment cap, and therefore placed an additional 5 feet of sand. We decided that since we had the contractors working on the upland cap in the field, that we could inexpensively repair the bubble pathway. We also had the opportunity to use the new CETCO product, an organoclay mat. CETCO provided us the material free of charge. We will remove the mats after one year and have them analyzed (by Dr. Reible at UT) to determine how much has been sorbed into the mats. We laid 2 mats down so that we could easily assess breakthrough. The purpose of assessing the ability of the mats to sorb creosote associated with the bubbling, is to determine whether this will be a cost-effective repair for the cap in the future. Below is a description of the reactive mat (organoclay mat) from the CETCO website.

Reactive Core Mat®

Product Description: A patented permeable composite mat consisting of reactive material(s) encapsulated in a nonwoven core matrix bound between two geotextiles. The upper geotextile is a needlepunched non-woven that is heat-laminated to a matrix of nonwoven fibers needlepunched into a woven geotextile. Through its innovative processing RCMTM can combine two active materials, if required.



Application: For in-situ subaqueous capping of contaminated sediments or post-dredge residual sediments. RCM provides a reactive material that treats contaminants which are carried by advective or diffusive flow. Reactive cap allows for thinner cap thickness than a traditional sand cap. Additional benefits of geotextiles provide stability and physical isolation.

RCM can also be used for embankment seepage control and groundwater remediation.

RCM Product	Contaminant(s)
Activated Carbon	PAHs, PCBs
Apatite	Heavy metals
Organoclay	PAHs, PCBs, organo-Hg

We used the organoclay mat with 0.8 lbs of organoclay per square foot of mat. We used a 15 foot by 10 foot section of mat, although the bubble pathway was only mm in diameter and remained in the same spot over the 3 weeks that we were observing it. We centered the mat over the bubble pathway.

Initially, we placed a pile (2-3 feet) of sand over the bubble while we were awaiting the shipment of the organoclay mats. Thus, prior to placing the mat, we needed to scrape the newly placed sand from the ACB so that the mats would be as close as possible to the origin of the bubbling. Once the sand was spread out and leveled, we centered the mat on the bubble location and laid the mat flat. The mat was easy to emplace using 3 people out in the water. Upon water saturation, minutes, it readily sank and was easy to move into place. We walked across the mat to ensure that it was in contact with the underlying ACB and lying flat. Using a back hoe, we spread a small layer of sand across the mat and then placed the second mat located directly overtop of the first mat with a small amount (inches) of sand between. Again we ensured that the mat was flat against the sand bottom and placed 4 50-lb sand bags on the corners. Then, we spread more sand overtop (inches) and then placed three 5 foot by 10 foot chain link fence panels overtop to demarcate the location and hold the mats down. Then, we spread the remaining sand, from the sand dump a few days prior, over the area.

The following day, we capped a larger area (900 sq. feet), overtop of where the mats had been placed (150 sq. ft. area). We capped it with an average of 4.5 feet of sand, 4 inches of filter gravel and a foot of 12-inch minus rock as armoring. I have attached a few photos of the bubble, the organoclay mats, and of mat placement.

Dr. Reible will be conducting a column study (for CETCO) using a couple of pieces of the organoclay mat used on our site. He will place creosote saturated sand in the base of the column, covered by the organoclay mat and then bubble gas up through the column. This work will be funded by CETCO. We will then have him analyze our blankets after they have been in place for approximately 1 year. Thus, we will have both lab and field data to make future assessments regarding the organoclay blankets for cap repair.

Feel free to call me with any questions.

Regards,

Heidi Blischke, R.G.
Lower Willamette Section
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, OR 97201

Phone: 503-229-5556
FAX: 503-229-6899

please visit our website at www.deq.state.or.us

Bubble

Bubble coated with creosote creating sheen burst at surface

Sand dump prior to emplacing OC mat

Spreading sand prior to laying the OC mat

Close-up of OC mat

Laying mat

Laying 2nd mat, can see sand bag in water over the first mat. Kevin moved the sand bag to the top of the 2nd mat.

Placing thin layer of sand over mats

Placing fencing over mats to demarcate

You can see sand bag and fence in water

Final sediment cap repair – 4.5 feet of sand, 6” filter gravel and 1 foot 12-inch minus rock over OC mat

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MEMORANDUM: TECHNICAL DATA SHEET FOR ORGANOCLAY REACTIVE CORE MAT

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CETCO
COLLOID ENVIRONMENTAL TECHNOLOGIES COMPANY
P.O. Box 428 • Lovell, Wyoming 82431
(307) 548-6521 • Fax (307) 548-6413

October 28, 2005

Ecology & Environment
c/o John Montgomery
333 SW 5th Avenue
Portland, OR 97204

Dear John Montgomery,

Enclosed is a copy of the Technical Data Sheet for Organoclay Reactive Core Mat.

Thank you,

Roger B. Wilkerson
Quality Assurance
CETCO
92 Hwy 37
Lovell, Wyoming 82431
(800) 322-1149 ext.423
(307) 548-6927 fax
e-mail: roger.wilkerson@cetco.com

CETCO® LINING TECHNOLOGIES

Technical Data

ORGANOCLAY REACTIVE CORE MAT™

MATERIAL PROPERTY	TEST METHOD	VALUE
ORGANOCLAY		
Bulk Density Range	CETCO Test Method	45 – 55 lbs/ft^3
Moisture Content	ASTM D 2216	$\leq$ 5%
Hydraulic Conductivity	ASTM D 2434	1 x 10^{-2} cm/sec minimum
Oil Adsorption Capacity	CETCO Test Method	0.5 lb of oil per lb of clay minimum
Quaternary Amine Content	TGA – CETCO Test Method	25 – 33% quat loading @ 800°C
FINISHED RCM PRODUCT		
Organoclay Mass per Area	CETCO Test Method	0.8 lb/ft^2
Mat Grab Strength	ASTM D4632	90 lbs. MARV

An aqueous permeable composite of geotextiles and a non-swelling granular clay compound that reliably adsorbs oil and similar organics from water.
Roll Size: 15' x 75'
Packaged on 4" PVC core tubes, and wrapped with 6 mil polyethylene plastic packaging.

CETCO® LINING TECHNOLOGIES

1500 West Shure Drive Arlington Heights, IL 60004 USA 800.527.9948 Fax 847.577.5571
For the most up-to-date product information please visit our website, www.cetco.com
A wholly owned subsidiary of AMCOL International Corporation

The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

G

Change Orders, Field Memoranda, and Field Directives

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CHANGE ORDERS

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CONTRACT CHANGE ORDER

CONTRACTOR: Advanced American Diving Service, Inc.

AGENCY: Oregon Department of Environmental Quality

CONTRACT NO. 5123-PA

CHANGE ORDER NO. 1

DATE August 18, 2005

PROJECT: McCormick and Baxter Sediment Cap Completion

This Change Order amends any or all preceding contract documents and correspondences which pertain to the subject of this order and authorizes the following changes in the work:

Based on the Contractor's proposal received August 18, 2005, the Contractor shall perform exploratory dive services and underwater loop cutting services on a unit rate per hour basis for a total not-to-exceed price of $47,269.24. David Evans Associates (DEA) is a subcontractor to the Contractor. Except for in-house DEA hours (not-to-exceed 20 hours at a hourly rate of $69.30), the Contractor's Superintendent or Engineer and Ecology and Environment's on-barge representative shall agree and sign each other's logbook as to the number of hours each group below worked. Except in unusual circumstances, groups will normally work either 4-hour days or 8-hour days.

The group rates are as follows:

Group	Hourly Rate
3-man dive crew with barge, boat, and all equipment	$451.50
4-man crane barge with tug, auxiliary barge, and all equipment	$989.23
DEA Field Hydrographer with GPS and Hypack software-4 hour day	$200.06
DEA Field Hydrographer with GPS and Hypack software-8 hour day	$139.41

Rates shall cover all plant, labor, equipment, material and profit to perform the work.

The scope-of-work is summarized below. Except for loop cutting, a representative of DEQ will most likely be on the barge to direct work. E & E will have a representative on the barge almost continuously and will be available to give specific locations.

SCOPE-OF-WORK:

		Estimated Group Hours		
Item	Description	Dive Crew Hours	Crane Barge Hours	DEA Field Hours
A	Obtain cores in sand in cap completion area	8	0	0
B	Map Cap Edge	12	12	0
C	Determine the condition of the ACB and 6-inch minus interface	8	0	8
D	Investigate the No-Armor Area	4	0	4
E	Check selected submerged logs and their impact upon the sediment cap.	4	0	4
F	Investigate the shoal downstream from the railroad bridge	4	0	4

G	Check “Armor Slough”	4	0	4
H	Check erosion near the railroad	4	0	4
I	Locate, mark if necessary, and cut plastic and stainless steel loops on the ACB	16	0	0
TOTAL FIELD HOURS		64	12	28

Although modifications to the sequence of the scope-of-work as indicated above may be beneficial, priority shall be given to

- the need to complete the sediment cap and then
- to assess the results of the investigation so repairs, if necessary, may be accomplished.

ORIGINAL NOT-TO-EXCEED (“NTE”) CONTRACT PRICE: $430,000.00

BALANCE OF PREVIOUS CHANGES:

TOTAL EXTRA: $0.00

TOTAL CREDIT: $0.00

TOTAL” NTE” CONTRACT PRICE BEFORE THIS CHANGE: $430,000.00

THIS CHANGE ORDER:

TOTAL EXTRA: $47,269.24

TOTAL CREDIT $0.00

TOTAL “NTE” CONTRACT PRICE TO DATE: $477,269.24

Four hundred seventy seven thousand two hundred sixty nine dollars and twenty four cents

AGENCY

BY: _____ DATE: _____

TITLE: _____

CONTRACTOR

BY: _____ DATE: _____

TITLE: _____

STATE OF OREGON - DAS

BY: _____ DATE: _____

TITLE: _____

CONTRACT CHANGE ORDER

CONTRACTOR: Advanced American Diving Service, Inc.

AGENCY: Oregon Department of Environmental Quality

CONTRACT NO. 5123-PA

CHANGE ORDER NO. 2

DATE August 30, 2005

PROJECT: McCormick and Baxter Sediment Cap Completion

This Change Order amends any or all preceding contract documents and correspondences which pertain to the subject of this order and authorizes the following changes in the work:

1. Additional 6" Minus Rock

   a. Furnish an additional 400 tons of 6" minus rock.
   b. Install 200 tons beneath the contracted rip-rap.
   c. Install 100 tons in three discrete repair areas discovered by recent dive team inspections, as specified by the project engineer.
   d. Install 100 tons over barge spud locations that penetrated the sediment cap.
   e. Installation shall include 8 hours of crane barge time with associated crew.
   f. The TOTAL "NTE" CONTRACT PRICE will be increased by $13,193.84 for this fixed price item.

ORIGINAL NOT-TO-EXCEED ("NTE") CONTRACT PRICE: $430,000.00

BALANCE OF PREVIOUS CHANGES:

TOTAL EXTRA: $47,269.24.00

TOTAL CREDIT: $0.00

TOTAL" NTE" CONTRACT PRICE BEFORE THIS CHANGE: $477,269.24

THIS CHANGE ORDER:

TOTAL EXTRA: $13,193.84

TOTAL CREDIT $0.00

TOTAL "NTE" CONTRACT PRICE TO DATE: $490,463.08

Four hundred ninety thousand four hundred sixty three dollars and eight cents

AGENCY

BY: _____ DATE: _____

TITLE: _____

CONTRACTOR

BY: _____ DATE: _____

TITLE: _____

STATE OF OREGON - DAS

BY: _____ DATE: _____

TITLE: _____

CONTRACT CHANGE ORDER

CONTRACTOR: Advanced American Diving Service, Inc.

AGENCY: Oregon Department of Environmental Quality

CONTRACT NO. 5123-PA

CHANGE ORDER NO. 3

DATE September 1, 2005

PROJECT: McCormick and Baxter Sediment Cap Completion

This Change Order amends any or all preceding contract documents and correspondences which pertain to the subject of this order and authorizes the following changes in the work:

1. Additional 6" Minus Rock

    a. Furnish an additional 200 tons of 6" minus rock.
    b. Install at locations directed either by DEQ or the Engineer.

2. Additional Rip-Rap
    a. Furnish an additional 600 tons of rip-rap
    b. Install at locations directed either by DEQ or the Engineer.

This work is pursuant to the Contractor's Proposal dated August 31, 2005. The work will involve 8 hours of a tugboat, barge, and crew to load and transport materials, as well as 20 hours of barge, crane barge, tugboat, crew and operators to place material. The total lump sum price for this Change Order is $40,148.36.

ORIGINAL NOT-TO-EXCEED ("NTE") CONTRACT PRICE: $430,000.00

BALANCE OF PREVIOUS CHANGES:

TOTAL EXTRA: $60,463.08

TOTAL CREDIT: $0.00

TOTAL" NTE" CONTRACT PRICE BEFORE THIS CHANGE: $490,463.08

THIS CHANGE ORDER:

TOTAL EXTRA: $40,148.36

TOTAL CREDIT $0.00

TOTAL "NTE" CONTRACT PRICE TO DATE: $530,611.44

Five hundred thirty thousand, six hundred eleven dollars and forty four cents.

AGENCY

BY: _____ DATE: _____

TITLE: _____

CONTRACTOR

BY: _____ DATE: _____

TITLE: _____

STATE OF OREGON - DAS

BY: _____ DATE: _____

TITLE: _____

CONTRACT CHANGE ORDER

CONTRACTOR: Advanced American Diving Service, Inc.

AGENCY: Oregon Department of Environmental Quality

CONTRACT NO. 5123-PA

CHANGE ORDER NO. 4

DATE October 12, 2005

PROJECT: McCormick and Baxter Sediment Cap Completion

This Change Order amends any or all preceding contract documents and correspondences which pertain to the subject of this order and authorizes the following changes in the work:

1. Provide the following additional Quantities of Materials aboard a barge at the site and mobilize/demobilize equipment and personnel to and from the site.

   a. Riprap-500 tons.
   b. 6-inch minus-350 tons
   c. Sand-400 tons
   d. 7 CETCO Reactive core mats 100'x15'
   e. CETCO Spreader Bar.

   The spreader bar shall become the property of DEQ and shall be placed within the Support Area at a location to be directed by DEQ when the in-water work is complete.

   Place the materials as indicated on the attached sketches and as directed by DEQ. Provide information on the as-built location of materials. Ancillary work includes removal of pilings and logs by divers within the work area prior to placement of materials. Additionally, spud holes within the cap that were previously created by the Contractors operations shall be filled.

   The total lump sum price for this Item 1 of the Change Order is $87,864.03 is pursuant to the Contractor's Proposal dated October 6, 2005.

2. Provide a Dive Barge and Crew to perform sampling in accordance with the scope-of-work described in the attached technical memorandum dated September 15, 2005, as modified on October 4, 2005. This work shall be performed at the unit price of $451.50 per hour for the dive barge and crew and a unit price of $237.35 per hour for the DEA representative. The work shall not exceed 24 hours for either unit price item. The deliverable for this item shall be the samples and a table of northings, eastings, and sample ID for each sample. The total not-to-exceed price for the work in Item 2 is $16,532.40 per the Contractor's proposal dated October 6, 2005..

3. In order to update, clarify, correct, and complete Sediment Cap Record Drawings produced by DEA on January 11, 2005 (file name: REMT2ab.dwg) the following shall be performed by DEA:

   a. Field Survey Work

      Acquire GPS coordinates on several cap features, including but not limited to the "blister repair area" from the 2004 sediment cap construction, any locations currently showing oil sheen, and along the ACB edge everywhere except in Willamette Cove to verify the DEA November 2004 Survey of the ACB edge. This work will be performed under the direction of E & E or DEQ. E & E and DEQ believe that these locations will be unsubmerged and it will be possible to perform the survey from dry land. This effort will take no more than 8 hours and will be paid at the price of $139.41 per hour.

b. Office Work

Provide draft and final electronic files and hardcopy drawings of the sediment cap features, including the survey specified in Item a above and any other dive surveysthat were performed after the date of the record drawings to E & E and DEQ for review. Most of the Hypack data collected during the dive survey was converted into a CAD drawing and organized by Mike Mutschler and Vanessa Rayner in DEA's office on August 26, 2005. This work shall take no more than 16 hours and will be paid at the unit price of $66.00 per hour.

The total not-to-exceed price for Item 3 of this Change Order is $2224.06 per the Contractor's proposal dated October 6, 2005.

The sum of the lump sum and not-to-exceed prices in Items 1, 2, and 3 above is $106,620.50.

ORIGINAL NOT-TO-EXCEED ("NTE") CONTRACT PRICE: $430,000.00

BALANCE OF PREVIOUS CHANGES:

TOTAL EXTRA: 100,611.44

TOTAL CREDIT: $0.00

TOTAL" NTE" CONTRACT PRICE BEFORE THIS CHANGE: $530,611.44

THIS CHANGE ORDER:

TOTAL EXTRA: $106,620.50.

TOTAL CREDIT $0.00

TOTAL "NTE" CONTRACT PRICE TO DATE: $637,231.90

SIX HUNDRED THIRTY SEVEN THOUSAND, TWO HUNDRED THIRTY ONE DOLLARS AND NINETY CENTS..

AGENCY

BY: _____ DATE: _____

TITLE: _____

CONTRACTOR

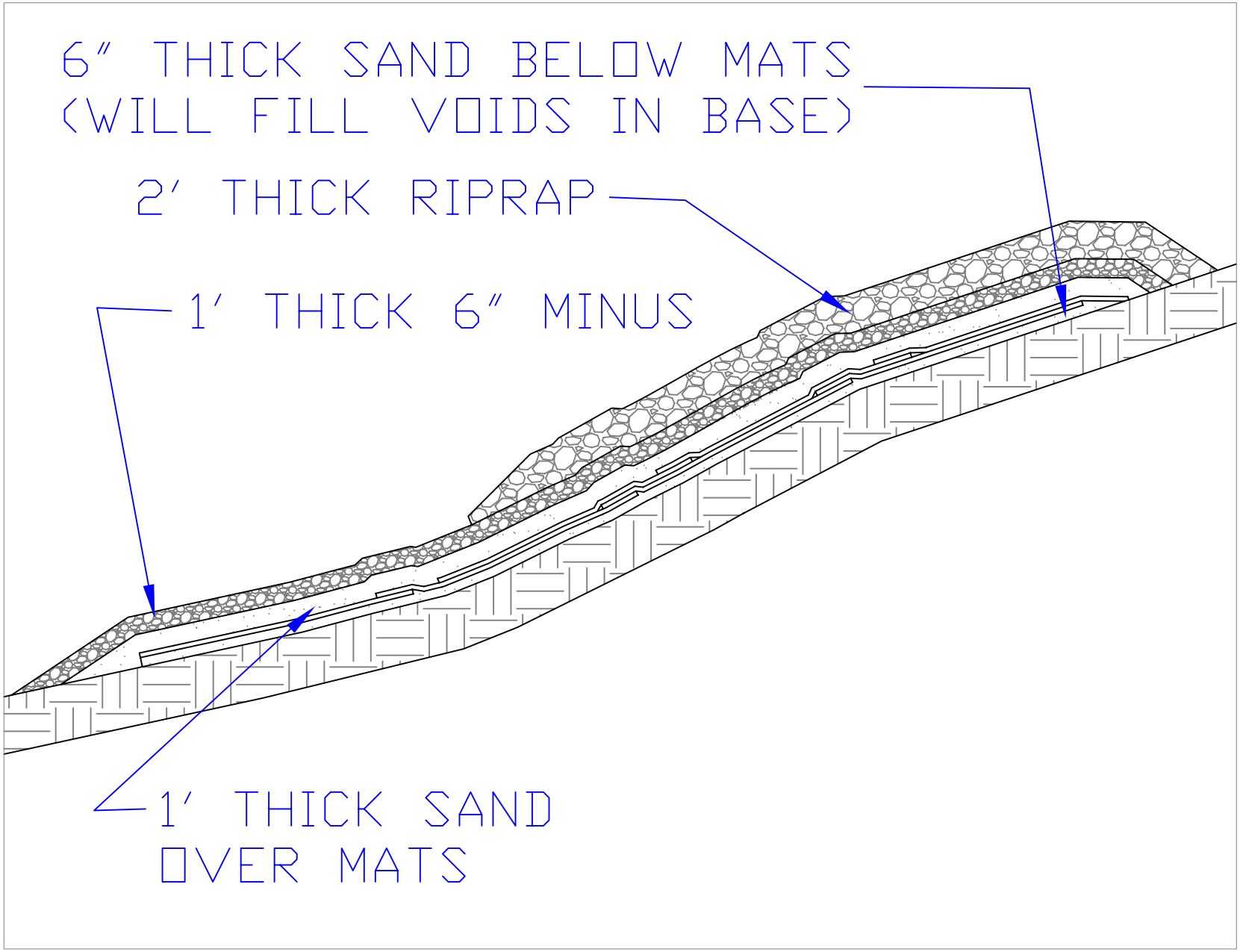
BY: _____ DATE: _____

TITLE: _____

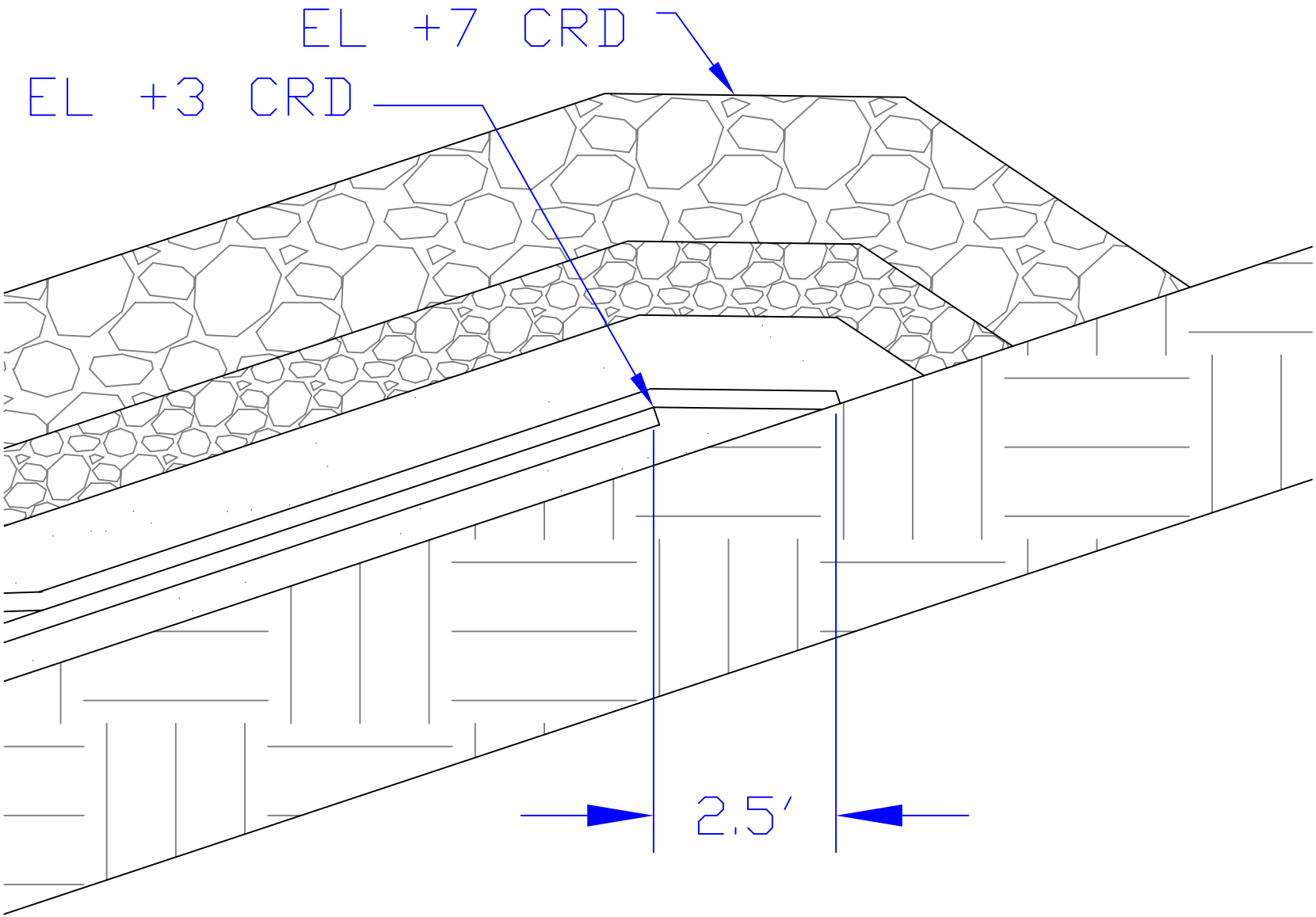
STATE OF OREGON - DAS

BY: _____ DATE: _____

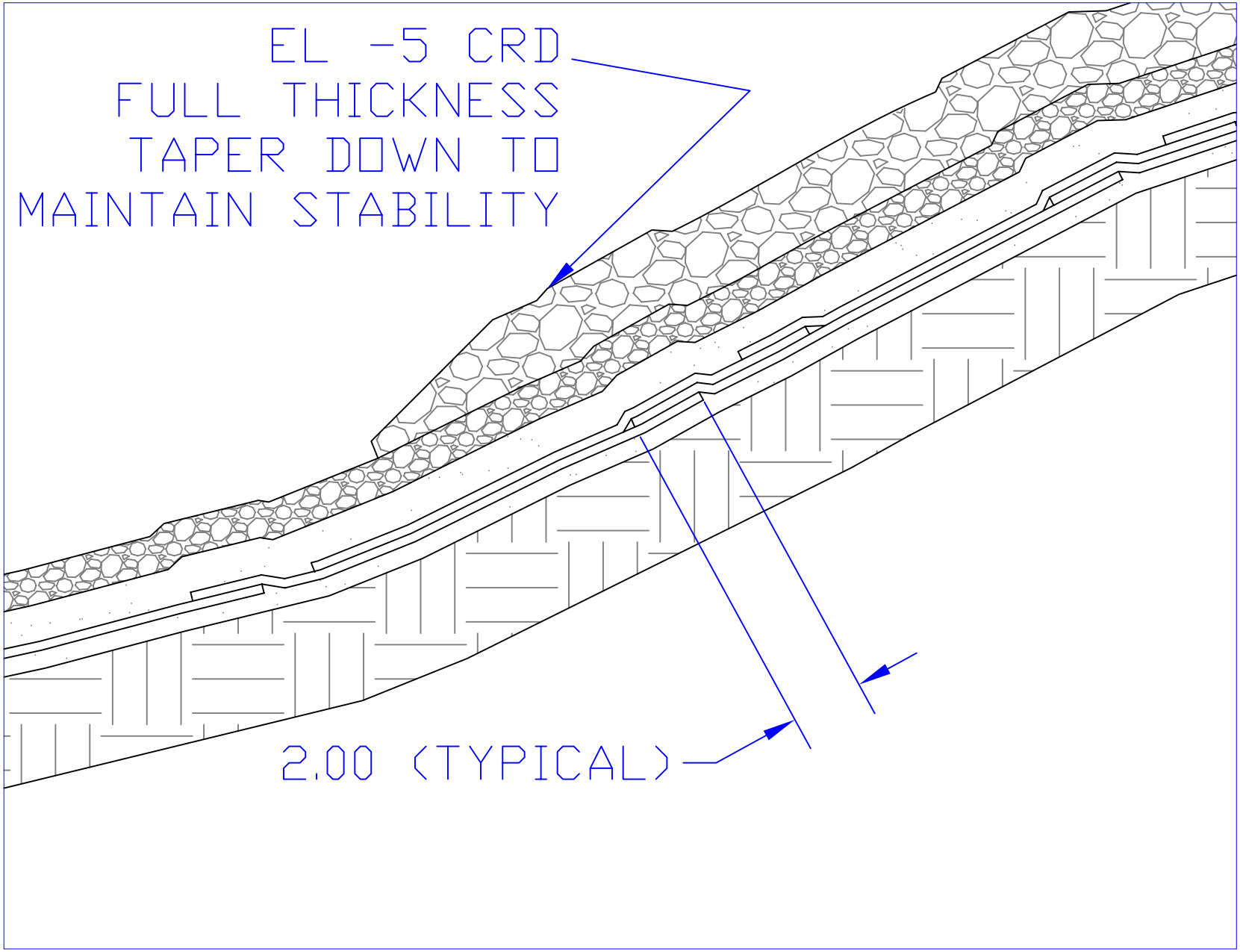
TITLE: _____


6″ THICK SAND BELOW MATS
(WILL FILL VOIDS IN BASE)
2′ THICK RIPRAP
1′ THICK 6″ MINUS
1′ THICK SAND
OVER MATS

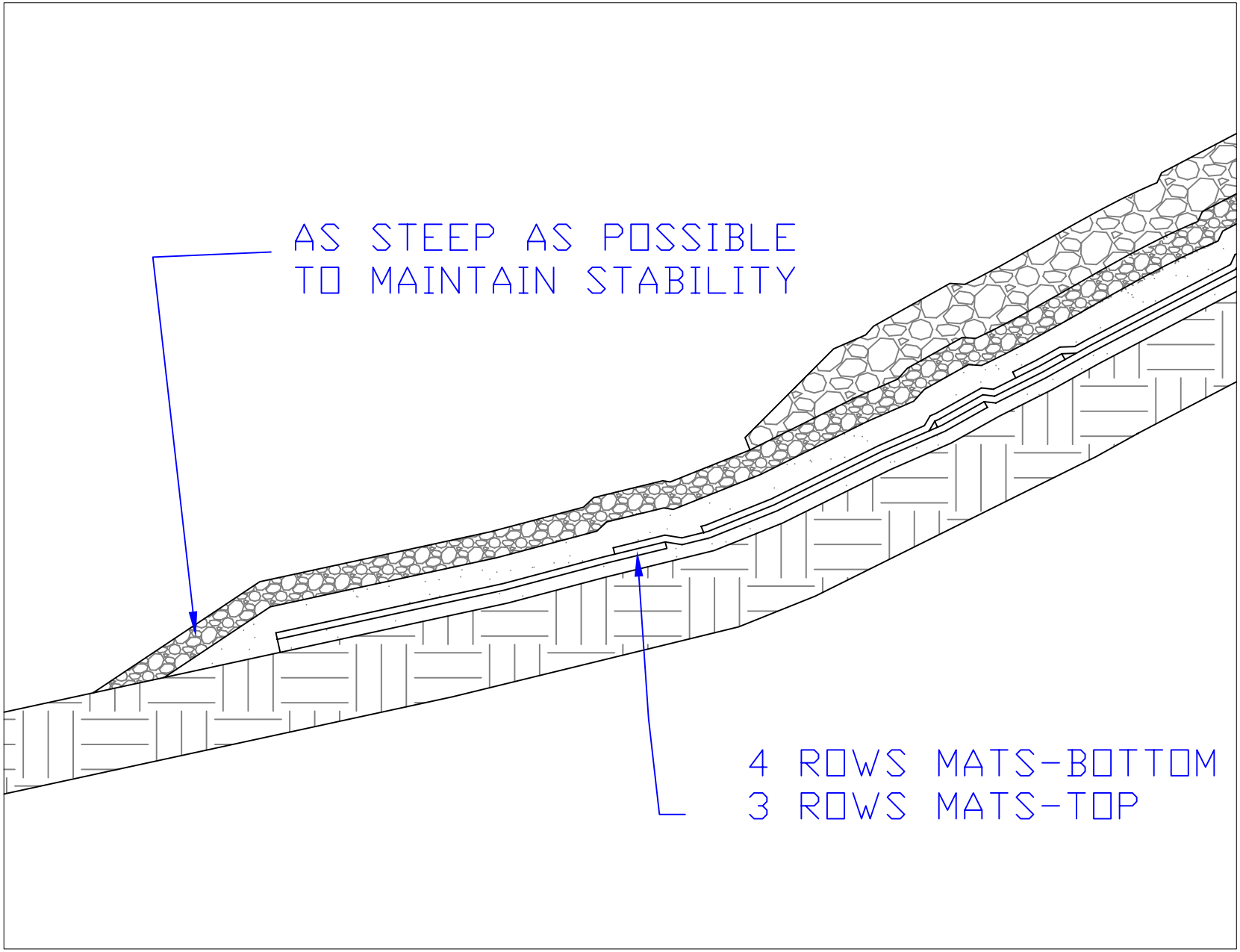
SECTION



DETAIL 1


EL -5 CRD
FULL THICKNESS
TAPER DOWN TO
MAINTAIN STABILITY
2.00 (TYPICAL)

DETAIL 2


AS STEEP AS POSSIBLE
TO MAINTAIN STABILITY
4 ROWS MATS-BOTTOM
3 ROWS MATS-TOP

DETAIL 3

ecology and environment, inc.
International Specialists in the Environment

Portland Office
333 SW Fifth Avenue, Suite 608
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

Technical Memorandum

To: Kevin Parrett, Project Manager (DEQ) – McCormick and Baxter Superfund Site

Date: September 15, 2005, Modified October 4, 2005

From: George Lukert , Modified by Alexander Whitman

Subject: Draft Scope of Work-2005 Surface Water and Transition Zone Water Investigation

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1. INTRODUCTION

Ecology and Environment, Inc. (E & E) under contract with the Oregon Department of Environmental Quality (DEQ) is scheduled to conduct the 2005 Surface Water and Transition Zone Water Investigation, beginning September, 2005 at the former McCormick and Baxter Company Creosoting Plant in Portland, Oregon (Figure 1). The purpose of this investigation is to obtain representative surface water, and transition zone water (porewater) samples for use in evaluating site conditions under low-river stage conditions after the sediment cap installation (completed in October 2004). Samples will be collected in two phases as part of the 2005 sampling event. The first phase will consist of the collection of surface water samples by Oregon State University personnel on behalf of DEQ. The second phase will consist of the collection of transition zone water samples by E & E in October 2005. The latter event will require the assistance of divers to place and retrieve sampling equipment at deeper water sampling locations.

2. STATEMENT OF WORK

2.1 GENERAL

To assist E & E in the collection of transition zone water samples, Advanced American Diving will furnish all materials, equipment, labor, and incidentals necessary to complete the work as specified in the scope of work. This investigation requires the use of vessels, divers and underwater breathing and protective equipment to install sampling devices at 17 proposed locations at depths up to 45-feet underwater. The methods used to conduct these activities are described below.

The diving contractor will be required to provide all appropriate equipment for diving and installation of sampling devices. Sampling devices consisting of Henry samplers, and/or modified sampling probes will be supplied by E & E. All other associated sampling equipment such as tubing, fittings, pumps, and sampling containers will also be supplied by E & E

2.2 COLLECTION OF TRANSITION ZONE SAMPLES

2.2.1 Methods

Seventeen sample locations are proposed for porewater samples. These locations are found at water depths ranging from 5 to 45ft. A diver will be required to navigate to specified locations, clear away armoring on the bottom, and install sampling devices. The armoring generally consists of roughly 6 to 18-inches of 6 to 10-inch minus rock. Beneath the armoring, is a layer of sand roughly 24-inches thick. It is into this layer of sand that the sampler shall be inserted. At up to four locations the armoring overlying the targeted sand layer consists of articulated concrete block overlaying a geotextile fabric, and approximately 4-inches of filter gravel. At these locations, the appropriate sampling device (described below) will be driven between the blocks and through the underlying geotextile and gravel to the appropriate sampling depth. The anticipated sampling device may be either;

A. PushPoint® mini-piezometer probes (Henry Samplers) made of small diameter 316 stainless steel. They are available in several different lengths ranging from 14-inches to 72-inches. The devices are pushed into the sediments to the desired depth using a twisting motion. When the desired depth is reached, an internal guard-rod is removed from the probe body. Plastic tubing shall then

be attached to allow collection of the sample using a peristaltic pump aboard the vessel. Or;

B. Soil Vapor Extractor (SVE) probes. These Probes are similar to the Henry Samplers, however, the SVE probes are larger and stronger allowing them to be placed using a slide hammer or similar device. Once in place, plastic tubing will be attached to the sampler to collect the sample from the vessel using a peristaltic pump.

Installation of either sampling device will require using fittings and tools (e.g. crescent wrench, screw driver) to connect the tubing to the sampling device. Specifications for both devices are attached. Following the sample collection, the sampling device shall be removed and decontaminated by the Contractor for use at the next sample location.

2.2.2 Equipment

Advanced American Diving (AAD) will supply a vessel capable of transporting their personnel and equipment and at least two E & E field personnel. The vessel shall be equipped with GPS technology and sufficiently shallow draft to allow the diving crew to access all specified sampling locations (see Figure 2.).

AAD will supply personal diving apparatus, and air supply to complete the task. Diving apparatus will consist of wetsuits, fully encompassing helmets with air supply, communication links, and other items as needed. Divers will be connected to the surface vessel via the air and communication umbilical lines.

2.2.3 Personnel

One diver shall operate in the water to remove armoring and place/remove sampler. A second diver will remain on the surface vessel, ready to assist the first diver in the event of problems or an emergency. A third AAD person will operate the vessel, the air supply, and the communications equipment. Additional personnel may be required so that work can continue for up to ten hours per day.

The Contractor shall arrange for 1 DEA person to be on the barge to take GPS readings.

Additionally, two E & E personnel will remain on the vessel to document all activities, communicate with the diver, GPS the location, and collect and package the samples.

3.3 POREWATER SAMPLE LOCATIONS

There are ten proposed Transition Zone sample locations where a diver must sample the location. These locations range form 5 to 45-ft below water surface and are shown on Figure 2. Note that sample locations 15 and 16 are surface water sampling locations only, and will not require diver assistance.

Attachments:
Figure 1: Site Location Map
Figure 2: Proposed Surface Water and Pore Water Sample Locations
Attachment A: Technical Specifications for AMS Gas Vapor Probe with Extensions
Attachment B: Operators Manual and Applications Guide for MHE Products Push Point Sampler

ATTACHMENT A

Technical Specifications for AMS Gas Vapor Probe with Extensions

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FIELD Environmental Instruments

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AMS

Gas Vapor Probe With Extensions

Supplied as a set of parts for sampling to depths of about 4' (1.2m) by hand using the supplied cross handle. This gas vapor probe may be used to probe to greater depths using additional extensions and the Slide Hammer available separately.

The GVP Base and Extensions are provided with liner rods to prevent soil entering the probe as it is driven. They are removed before sampling and a barbed adapter is threaded onto the upper end of the sampling string for attachment of a sampling tube.

AMS has perfected the design of extensions for use with hand sampling equipment. The Standard Extensions are made from high tensile carbon steel type 4130. They are light to carry and maintain their torsional and compressive strengths.

For sensitive sampling situations, or where an acid bath decontamination will be required, AMS Extensions made from hard drawn stainless steel tube type 304 are available. The Extensions are made in five lengths, from 1' to 5' (0.3 m to 1.5 m) with either threaded, Quick Spin or Quick Connect couplings.

INFORMATION

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Braddock, PA 15104

For Orders or Inquiries:
800-393-4009
Fax 412-271-5083

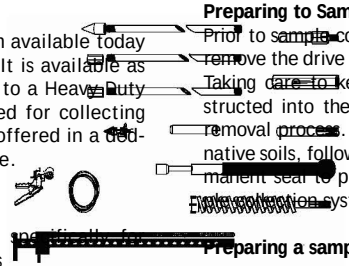
Visit us soon on the web
www.fieldenvironmental.com

GAS VAPOR PROBE KITS

TECHNICAL DATA SHEET

DESCRIPTION:

The Gas Vapor Probe System is the finest system available today for environmental assessment and monitoring. It is available as a series of kits from a Basic Kit without a drill to a Heavy Duty Kit that also includes AMS Flighted Augers. Used for collecting samples of soil gas at shallow depths. Tips are offered in a dedicated tip or a retract-a-tip, which is removable.



BENEFITS AND FEATURES:

The AMS Gas Vapor Probe has been designed specifically for placement of devices used to recover soil gas samples. The GVP kit may also be used for collection of soil and groundwater samples when used with accessory screens that are sold separately.

USE:

The site should be surveyed for the presence of underground utilities, pipelines, underground tanks and piping, as well as other structures or objects. The position of underground objects should be flagged and/or marked to local protocols. Use the electric drill with 1 1/2" Concrete Bit to cut a hole in the pavement if necessary, prior to using the tile probe. Once the pilot hole has been made, proceed sampling using the GVP points. Following the determination of sample collection depth, cut a length of Flouropolymer tubing slightly longer than collection depth. This extra length is to aid in the ease of sampling with tip installed. Attach one end to the barbed nipple on the selected sampling tip. Assemble from the sampling tip up. Place the assembled sampler, comprising tip assembly, extension, and extension drive adapter tip downward into the hole prepared by the Tile Probe. Certain soil conditions may allow for the assembled piece to be driven directly into the soil itself. Driving may be accomplished via AMS Slide Hammer, or electric rotorary hammer drill. Once the first extension has been lowered or driven into the ground, place at clamp (not supplied) at ground level to stabilize it. Lift the driving device off the probe assembly, loosen and remove extension drive adapter from the extension and teflon tubing. Pass the tubing through another GVP extension with the coupling down. Remove ground clamp, and continue to drive and add extensions until sampling point(s) have been reached.

Preparing to Sample - GVP Tip

Prior to sample collection, it is necessary to expose tip and possibly remove the drive tip end, GVP extensions & extension drive adapter. Taking care to keep the tubing clean will allow it to pass unobstructed into the Extension Drive Adapter during the assembly & removal process. After removal, fill in around tubing with sand or native soils, followed by bentonite chips or powder to provide a permanent seal to protocol. Attach Flouropolymer Tubing to the sampler collection system with a short piece of flexible tubing.

Preparing a sample - Retract-A-Tip

When sampling depth is reached, pull back the sampler assembly 3" either manually or with the Removal Jack. Take the sample and then proceed to the next sampling depth. When sampling is completed, remove the sampler and pack the hole with native soils and/or bentonite chips, powder or grout.

Application of a gentle vacuum to the proximal end of the Flouropolymer tube will draw soil gas through the selected Gas Vapor Tip, through the tubing, and eventually the pump.

HELPFUL HINTS:

Suggested use of the tile probe in preparation of hole allows for the location of unknown obstructions, thereby eliminating potential damage of GVP Probe & speeding up the sampling process. Threads should always be cleaned after each use. Vegetable oil, used sparingly, can be used for thread lubrication. It is important to never contaminate any part(s) of the system that may come in contact with the sample. Always check to make sure that the power supply and cord are in proper working condition. Please refer to operator's manual and instructional video prior to use of this product.

ANCILLARY ITEMS:

Soil Probes, Tile Probes, Ground Clamps, Screens, Electric Vacuum pump or Vacuum Station

ATTACHMENT B

Operators Manual and Applications Guide for MHE Products Push Point Sampler

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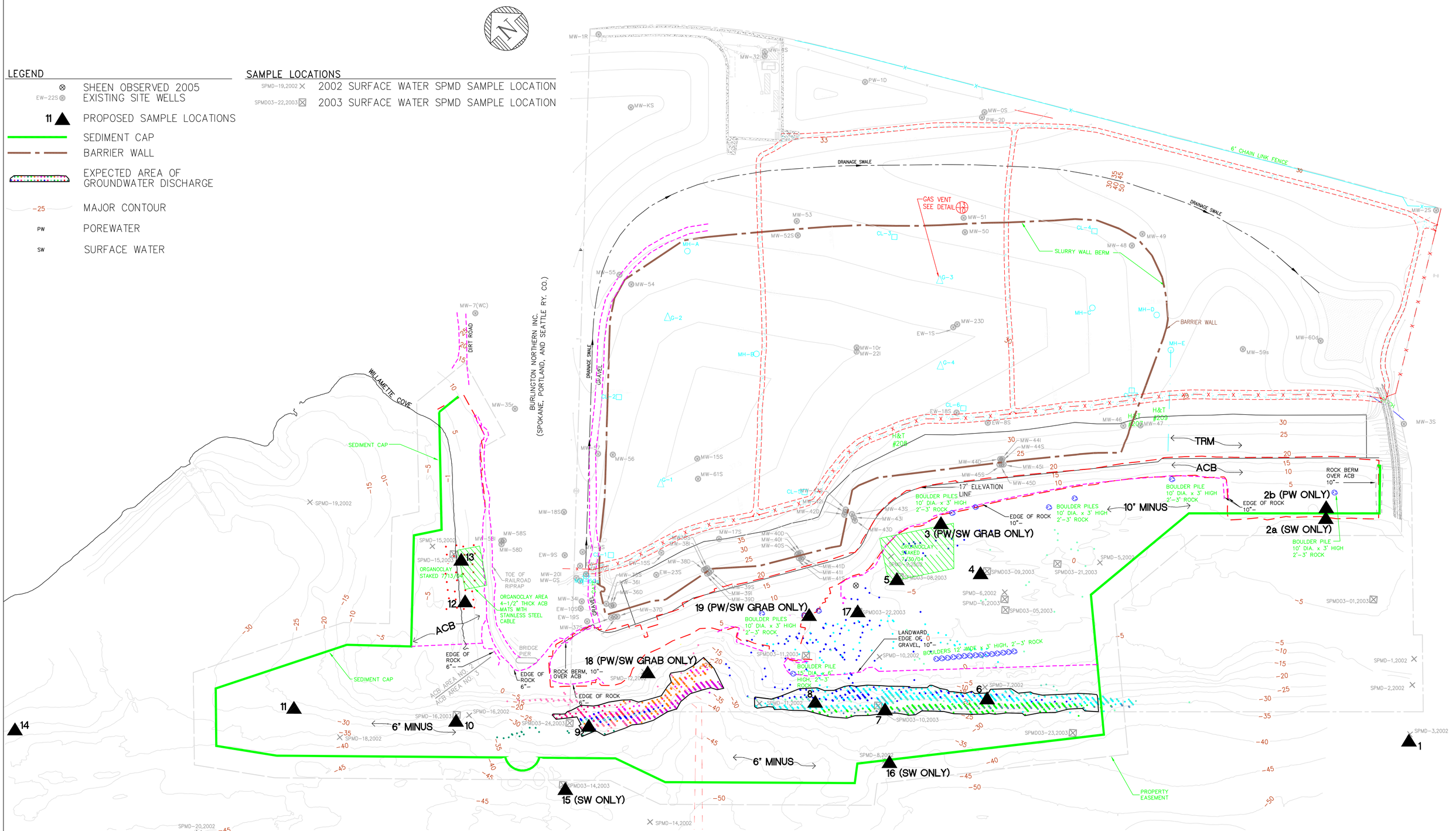
LEGEND

- SHEEN OBSERVED 2005
- EW-22S EXISTING SITE WELLS
- 11 PROPOSED SAMPLE LOCATIONS
- SEDIMENT CAP
- BARRIER WALL
- EXPECTED AREA OF GROUNDWATER DISCHARGE
- -25 MAJOR CONTOUR
- PW POREWATER
- SW SURFACE WATER

SAMPLE LOCATIONS

- SPMD-19,2002 2002 SURFACE WATER SPMD SAMPLE LOCATION
- SPMD03-22,2003 2003 SURFACE WATER SPMD SAMPLE LOCATION



SCALE IN FEET: 1"= 100'

0 100 200 300

ecology and environment, inc. International Specialists in the Environment Portland, Oregon		FIGURE 2: PROPOSED SURFACE WATER AND PORE WATER SAMPLE LOCATIONS FOR THE FALL 2005 SAMPLING EVENT
DESIGNED BY: E. HALE		McCORMICK & BAXTER CREOSOTING CO. PORTLAND, OREGON
CHECKED BY:		
DRAWN BY: K. KRAJEWSKI	APPROVED BY A. WHITMAN	SCALE: NOTED; DATE ISSUED: 9-08-05; C.A.D. FILE NO.: PROPOSED SAMPLES.dwg; DRAWING NO.: 1 of 2

REVISIONS

MHE Products PushPoint Sampler (Patent Pending)
Operators Manual and Applications Guide

Ver. 2.00 8/5/01

Models: PP27, PP14, PPX36, PPX72

Introduction

The groundwater/surface water interface (GSI) has been a research interest of mine for the past decade. This transitional zone is usually rich in biomass and may play a predominant role in the bioattenuation of contaminated groundwater entering surface water bodies. Usually these biologic processes have limited effectiveness in attenuating highly contaminated groundwater, leaving a plume of parent contamination and metabolic byproducts that eventually expresses itself in receiving waters - usually classified as non-point sources of pollution because of the uncertainty of the discharge area. Part of the problem in the detection and study of these plumes is that there were no devices on the market for the rapid, discrete collection of pore water samples. Reliance on conventional technology and techniques to perform a detailed investigation required extensive effort and burdensome equipment.

Through several iterations, I have evolved a simple device for collecting pore water samples from beneath surface water bodies or the beach areas surrounding them. Pore-water sampling using the PushPoint becomes a simple and efficient process, generating a wealth of information and very little waste. If one collects groundwater samples in a transect perpendicular to groundwater flow in the suspected area of plume discharge to an open water body, their analysis yields information about the aerial extent of contaminant discharge to the water body. At this point, additional sampling can complement the initial data and provide the information necessary to map the plume expression in both magnitude and aerial distribution. This is becoming increasingly important to regulators as they decide the ecological impacts of discharging contaminant plumes.

Sampling at each location usually takes 5 minutes, allowing a small crew to collect dozens of samples in an afternoon. These samples can be analyzed in the field for real-time information useful in directing field investigations and research. The work that I have conducted at several contamination sites indicates that many groundwater plumes discharge in surface water bodies in 2-3' of water depth - accessible to investigators wearing hip boots or waders. Many plumes, especially Light Non-Aqueous Phase Liquid (LNAPL) plumes can be delineated by collection of samples in very shallow water or from under beaches. My initial experience has shown that Dense Non-Aqueous Phase Liquid (DNAPL) contaminant plumes express themselves in the shallow, near-shore water as well, even though the on-shore depth of the contaminant mass was deep in the aquifer.

Directions

Look at Figure 1.

As you can see, the PushPoint device is a very simple, precisely machined tool consisting of a tubular body fashioned with a screened zone at one end and a sampling port at the other. The bore of the PushPoint body is fitted with a guard-rod that gives structural support to the PushPoint and prevents plugging and deformation of the screened zone during insertion into sediments. The PushPoint is made of 316 stainless steel assuring compatibility with most sampling environments. The screened-zone consists of a series of interlaced machined slots which form a short screened-zone with approximately 20% open area.

Operation of the device is not difficult. One simply holds the device in a manner that squeezes the two handles towards each other to maintain the guard-rod fully inserted in the PushPoint body during the insertion process (as shown in Figure 2). Holding the device in this manner, push the PushPoint into the

sediments or beach to the desired depth using a gentle twisting motion. When the desired depth is reached (or you hit refusal, usually at an aquitard) remove the guard-rod from the PushPoint body without disturbing the position of the deployed sampler. Once the guard-rod has been removed from the PushPoint, it SHOULD NOT be reinserted into the device until the bore of the PushPoint has been thoroughly cleansed of all sand, silt, etc.

Attach a syringe or peristaltic pump to the PushPoint sample-port (see Figure 3) and withdraw water at a low-flow sampling rate (50-200 ml/min.). The first 20-50 ml of groundwater will be turbid. This is the "development" water and should be discarded. Once non-turbid aliquots have been withdrawn, representative samples can be collected for on-site and off-site analysis.

Cleaning and Maintenance

I cannot stress how important cleanliness and linearity are to the working life of the instrument. The PushPoint was designed as an indefinitely reusable device; potentially able to be reused hundreds of times. The tolerance between the guard-rod and the bore of the PushPoint is very small. Increases in this tolerance through abrasion and damage may allow silty material into this annular space, eventually jamming the guard-rod into the bore - maybe permanently!

Excess wear and abrasion can also be introduced if the guard-rod is inserted frequently when the PushPoint body is bent. All the small bends should be "undone" prior to reinsertion of guard-rod to avoid scraping the sides of the bore causing burrs. Before reinsertion of the guard-rod into the cleaned PushPoint, the device should be "straight as an arrow". Use caution when straightening the screened-zone, it is somewhat delicate without the guard-rod inside it, and can be broken through repeated bending. Similarly, the guard-rod should be bend-free and clean when inserted into the bore of the device. When a clean and straight PushPoint is assembled, the guard-rod should slide fairly easily through the PushPoint bore and its handle should seat against the sampling port.

Clean the exterior of the guard-rod and PushPoint body and screened-zone with a stiff brush and cleaning solution (soapy water).Cleaning and decontamination of the bore of the instrument is easily accomplished using the cleaning adapter provided. Remove the spray nozzle of a "garden sprayer" filled with cleaning solution. Connect the adapter as shown in Figure 4. Insert the sampling port of the PushPoint to the adapter and squirt ~ 100 ml of pressurized cleaning solution backwards through the sampler and out the screened-zone into a waste receptacle. Gently push the guard rod into the bore of the PushPoint to its end to dislodge any bridged material. Re-rinse the bore with cleaning solution. Follow this with a distilled water and/or methanol rinse. Reinsert the guard-rod and the device is ready to be used again.

In some instances it may be advantageous to force the cleaning solution through the screened-zone and out the sampling port. To do so, gently insert the screened-zone of the PushPoint into the cleaning adapter, making sure not to bend the screened-zone, until the entire screened-zone is within the adapter. The screened-zone is somewhat fragile. To avoid damage, do not bend the screen-zone during insertion into the adapter. Squirt cleaning solution through the sampler to a waste receptacle.

Helpful Hints, Information, and Cautions

- Multiple depths can be sampled in one hole if samples are collected, in order, from deepest to shallowest. Insert the sampler using a twisting motion until you reach refusal. Remove the guard-rod. **Do not push the sampler further into the sediments once the guard-rod has been removed as this may damage the screened-zone and plug the device with sediment**. Once sampling has been completed at this deepest depth, the PushPoint can be partially pulled from the hole to a new sampling

elevation. Remember, to prevent screened-zone damage, do not to insert the PushPoint into the sediments without the guard-rod inserted into the PushPoint body. Alternately, multiple holes can be used to collect samples from multiple depths at a particular sampling location. If vertical sampling is performed in one hole, it is recommended that some type be device such as a sampling platform be used to prevent lateral movement and slippage of the PushPoint as sampling is conducted near the top of the hole (see Figure 3). This offsets the leverage of the instrument and reduces hole degeneration. A simple platform would be a plate of steel with a 3/16" dia. hole through its center and would serve the fundamental purpose of maintaining a rigid hole opening . MHE offers a 8" dia., heavy-duty steel sampling platform engineered for the precise sampling depth requirements of field research. If repeated shallow sampling is to be conducted, it may be more convenient to use a shorter sampler (i.e. MHE - PP14").

- If you wish to reuse the PushPoint sampler at a particular sampling location and want to clean the bore quickly while you're there so that the guard-rod may be safely reinserted, you can use a syringe filled with surface water or DI water to backflush the bore several times before reinserting the guard-rod. Use at least 100 ml of water. If you have too much trouble reinserting the guard-rod (i.e. grit), it will be necessary to use the standard cleaning procedures.
- If the screened-zone of the PushPoint becomes plugged while inserted in the sediments due to passage through "something", it is frequently possible to hydraulically/pneumatically shock the screened-zone free of adhering material while it is inserted into the sediments. Attach a large-volume (50 ml) syringe to the sampling port. In a quick motion, pull the syringe plunger most of the way back (creating a vacuum) and then immediately release the plunger - the plunger will slam to a neutral position, sending a shock wave through the bore of the PushPoint and may alleviate the problem.
- The PushPoint can be used as a piezometer to determine the static head of the groundwater and hence, the potential direction of groundwater movement. To do this, a tube is connected to the sample port as shown in Figure 5. A continuous stream of water is established from the syringe (or pump) to the screened-zone by pumping out any air remaining in the PushPoint /tubing. When the tube is disconnected from syringe, the static water level in the tube will represent the static water level at the depth that the screened-zone occupies. In some discharge areas I have found several feet of head differential, and when the tubing is removed, the PushPoint flows like a miniature artesian well.
- It is frequently possible to push the PushPoint through thin lenses of low-permeably material and collect samples from below them and gather valuable geochemical samples. At many of the sites where the PushPoint has been used, sampling from just below a layer of fine sand/silt/clay, one occasionally encounters seemingly large pockets of gas that seem to have coalesced and collected under this less permeable stratum. Analysis of these pockets may provide additional insight to predominant biological processes. It is likely true that the concentration of volatile chemicals in the groundwater has equilibrated with these bubbles which means that their presence in a sampling stream or syringe would not significantly affect the concentration of dissolved volatile organic chemicals (VOC's). In fact, if one assumes that equilibrium conditions exist, the concentration of VOC's in the bubbles is directly related the concentration in the surrounding groundwater. An different condition may exist if the groundwater is supersaturated with bacterial metabolic waste gasses and the negative pressure exerted by the pump (or syringe) initiates degassing of dissolved gasses from the groundwater. In this instance, VOC's would partition from the groundwater to the bubbles as they are formed in the sampling tubing (this is fairly evident if occurring). The consequence of this condition is that part of the dissolved contaminant mass has partitioned into the gas phase and unless the gas-phase is captured, quantified and accounted for, the native VOC concentration of the groundwater is not reflected by analysis of the groundwater alone. If this condition exists, the degassing effect can be minimized by decreasing the sampling rate to a rate more easily yielded by the sampled formation. With experience, it is easy to distinguish which of these conditions (or combination of conditions) exist and to what extent they affect sample quality.
- The internal volume of a PushPoint PP27 is approx. 1.5 ml. A 50 ml syringe full of distilled water, decon water, methanol, etc. will push about 33 volumes through the bore.
- When straightening the screened zone it is sometimes helpful to flush out the bore of the device with a cleaning solution and then insert the guard-rod to the area of the bend in the screened-zone. Gently unbend the portion of the screened-zone nearest the rod and carefully advance the rod to the next bend.

After the rod has been fully inserted into the screened-zone perform the final screened-zone, straightening until the guard-rod slides freely through it.

- If the sampling port of the PushPoint is above the static level of the water body, each time you remove the syringe or pump from the PushPoint sampling port, air will fill the bore of the PushPoint, allowing the water level in the bore to reach its static head. To avoid this plug of air from entering the subsequent syringe, attach a pinch clamp and/or a 3-way valve between the sampling port and the syringe or pump inlet as shown in Figure 7.
- I have conducted dye tests (concentrated uranine dye) by injecting concentrated dye under a perforated 1.5' diameter disk through which the PushPoint was inserted from depths of 3" - 12" into sediments. The goal of these tests was to determine whether or not surface water and dye are drawn into samples collected in near surface sediments (i.e. whether a cone of depression is formed). The results indicated that no surface water is drawn into samples even though sampling was conducted with a peristaltic pump at its maximum rate of 600 ml/min for several minutes.
- I usually couple my field investigations with global positioning system (GPS) identification of the sampling location. If conditions permit, a pin flag can be placed at the sampling location for later location by GPS - I usually use sub-meter grade GPS for this surveying. GPS can then used in the future to relocate previously sampled location even if certain site physical characteristics have changed (eroding shorelines, etc.). If long-term study of a shoreline is planned it will be useful to have an elevation benchmark established on shore that can be used as a reference. The elevation of the sampling locations can then accurately measured. This may be helpful in areas where sediment levels are not stable such as in erosional areas.
- Sampling by syringe has many advantages. This is my preferred field method due to its simplicity and versatility. It is useful to be able to collect several 50 ml syringes full of groundwater, store them on ice and perform the sample transfer to VOA vial, etc. under more controlled conditions. To transfer sample to a VOA vial, place the end of the transfer tube (Figure 8) to the bottom of the VOA vial. Dispense sample into the VOA vial and slowly withdraw the transfer tube from the vial maintaining the mouth of the transfer tube just below the sample surface. When the transfer tube is almost out of the vial, continue to dispense sample and leave an "anti-meniscus" of sample above the rim of the vial. Add several drops of HCl (which will displace a few drops of sample) and cap. If VOC samples are to be collected and/or stored temporarily in a syringe, I recommend 100% polyethylene/polypropylene ("two piece") syringes such as those made by Henke Sass Wolf GMBH (NormJect ®, 50 ml)) configured as shown in Figure 8. From personal experience I have found that small amounts of aromatic compounds (BTEX) can leach from the rubber parts of the rubber-tipped plunger found in common medical syringes. Rubber-tipped plunger syringes have less side-wall resistance and work much smoother than the 100% polyethylene/polypropylene syringes so I use medical syringes for "development" of the PushPoint. Standard medical syringes also work well for collecting samples for non-VOC analysis. I utilize handheld meters for pH, conductivity, redox, DO, etc. One can dispense sample from the syringe into these types of instruments for field measurements. The disposable syringes may be cleaned and reused several times, but because they are a friction fit; prolonged reuse results in scoring of the barrel which eventually causes air leaks.
- The 50 ml, 100% polyethylene/polypropylene "two piece" syringes mentioned above can be purchased directly from MHE, configured with tubing, clamp, and stopper as was the example syringe included with your order, or customized to suit your individual needs. If you would to make your own, the syringes that I am currently using are purchased from National Scientific. The tubing is Tygon 1/4"OD x 1/8" ID. Be sure to use some type of clamp at the tubing mouth to ensure a good seal at the sampler port. The entire syringe assemblies are now available from MHE at a reasonable cost.
- Headspace GC analysis of VOC's can be easily accomplished using 100% polyethylene/polypropylene syringes. Dispense all but 25 ml of the sampled groundwater from the syringe. Refill the syringe to the 50 ml mark with ambient air and then stopper the tubing (and heat the syringe in a water bath if desired) as shown in Figure 9. Shake the syringe assembly to equilibrate the VOC's in the sample with the contained atmosphere. Insert a GC syringe needle through the transfer tube into the sample syringe headspace and withdraw a sample for GC analysis.
- Occasionally a small amount sand and silt is withdrawn into the syringe or pump sampling stream, even after proper "development" of the PushPoint. This may be due to the nature of the geologic formation. This fine material is probably already at equilibrium with the surrounding groundwater and

tests have shown that its presence should not influence analysis of VOC's in the groundwater sample. The sample can be transferred to its shipping container without this silt if the syringe is dispensed in such a manner as to let the solid material settle out in the syringe and not carry over to the shipping vial.

- The PushPoint has been used very successfully for underwater investigations using SCUBA equipment and a series of 100% polyethylene syringes. Once again, GPS equipment was used for location of the position that the divers collected groundwater samples of contaminant plume expression in the lake. Underwater notes (temperature, depth, observations, etc.) can be written directly on the sample syringes if they are pre-prepared with a strip of Scotch Magic Transparent Tape applied down the syringe body and writing is done with a soft pencil.
- The PushPoint may be used to inject nutrients or dyes into the sediments for field trials of biologic or geochemical testing or tracing groundwater paths. Simply insert the PushPoint to the desired depth, and after the guard-rod has been removed, connect a syringe or pump and slowly inject the desired fluid into the sediments, perhaps followed by a small amount of native groundwater to flush the instrument.
- The PushPoint is constructed of 316 stainless steel as mentioned previously. There are two places where the stainless parts are silver soldered together, the handle of the guard-rod and the handle on the PushPoint sampler. If the investigator is collecting samples for metals analysis, the silver solder joint on the guard-rod may impart trace levels metallic residue to the sampling port mouth. This has never caused a problem but the possibility exists. The silver solder that I use is Safety-Silv 45 which contains silver (45%), copper (30%),and zinc (25%). MSDS available upon request. In the unlikely event that these metals cause contamination of samples, MHE can produce specialty guard-rods that are not silver soldered. What can I say, these devices were originally built to sample for VOC's.
- These devices can be dedicated as semi-permanent underwater monitoring devices. If a PushPoint is inserted to the desired depth through a plate (such as the sampling platform mentioned earlier) that can lock the sampler at the correct insertion depth, a vinyl cap can be placed over the mouth of the sampler, and the sampler can be dedicated to that location so that future samples can be withdrawn when desired.
- It has been useful to carry several samplers in "quivers" made of 2" PVC tubing….one tube for (10-15) clean/assembled samplers and one tube for used samplers and their separated guard-rods. This arrangement protects both the investigators and the instruments.
- I have been using a Myron 6P Ultrameter available from www.ColeParmer.com for most of my work. This instrument measures pH, specific conductance, ORP, temperature, and TDS using only a few milliliters of sample and is perfectly suited to samples dispensed by syringe. The instrument is waterproof to 3 m. There will soon be a link on the MHEproducts.com web page.
- I have been using the Chemetrics Vacu-Vial technique (www.Chemtrics.com) in conjunction with PushPoint sampling. I use this for dissolved oxygen and dissolved iron measurements. Many other analytical tests are also available such as nitrate, phenols, etc.. This analytical technique also works very well with samples collected in syringes. The sample is dispensed into a plastic cone until it overflows. The tip of an evacuated ampoule containing the necessary reagents is broken off at the bottom of the cone allowing the vacuum in the ampoule to pull in a aliquot of sample that has not contacted the atmosphere. The ampoule is shaken and is then is then placed as a cuvette into a handheld spectrophotometer. The results are nearly instantaneous and are displayed in ppm. There will soon be a link on the MHEproducts.com web page.

I hope that users will find many useful and innovative uses for this device. If you have other helpful information, uses, and advice concerning these samplers, please write or e-mail suggestions to me for inclusion in future manual revisions. I have finally started a web site: www.MHEproducts.com and have posted pictures, new products, and the latest version of this manual.

Thanks. MHE

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Figure 1

the PushPoint sampler

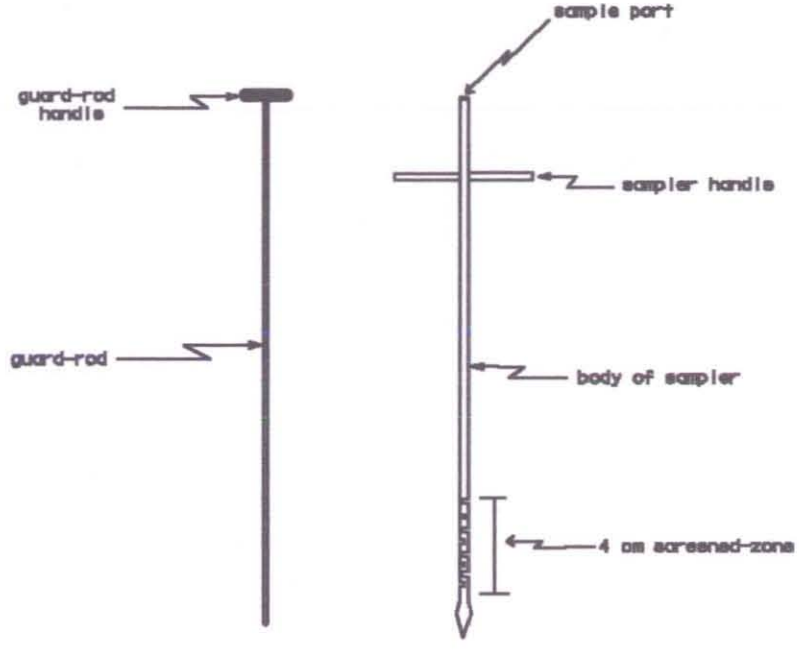

Fig. 1a

disassembled sampler

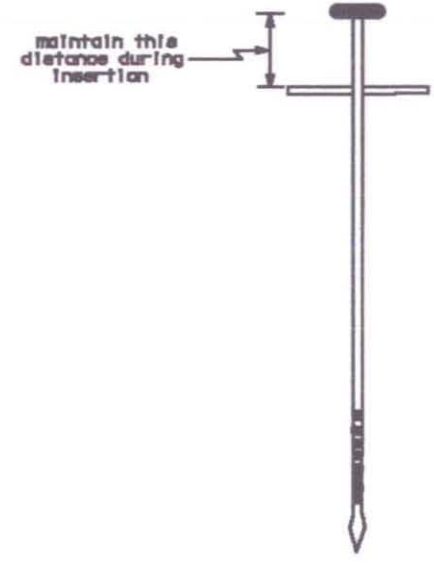

Fig. 1b

assembled sampler

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Figure 2

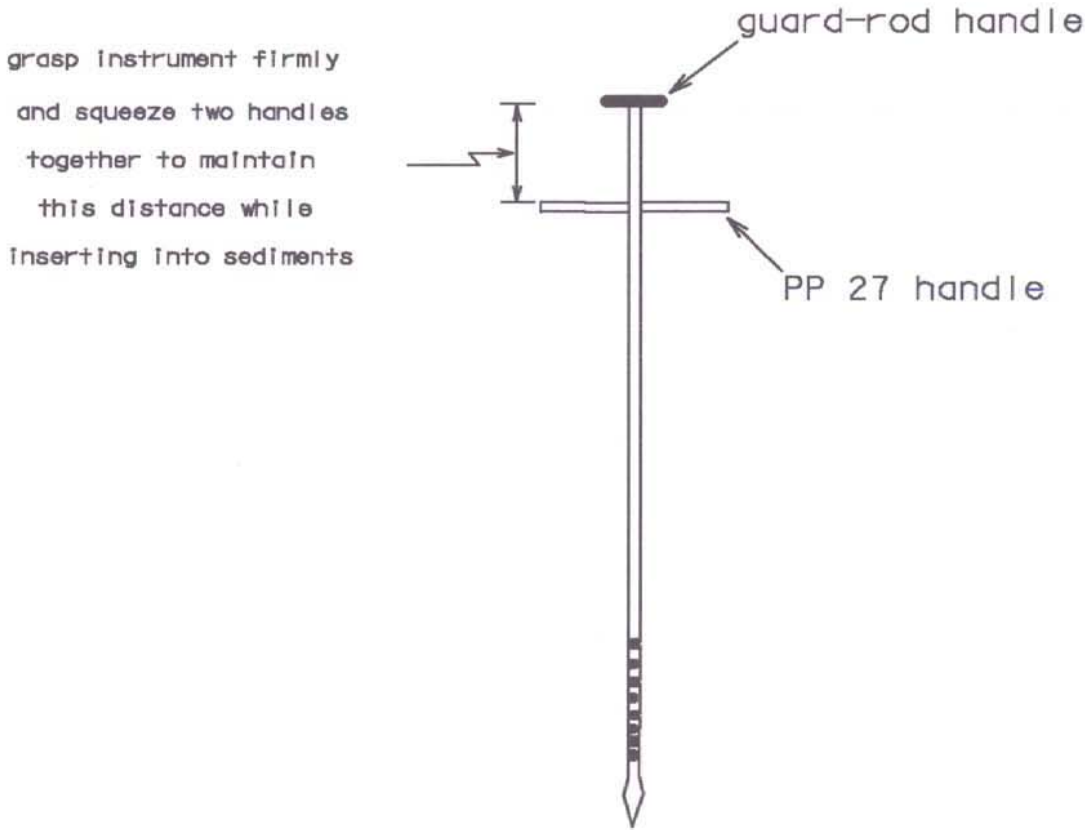

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Figure 3

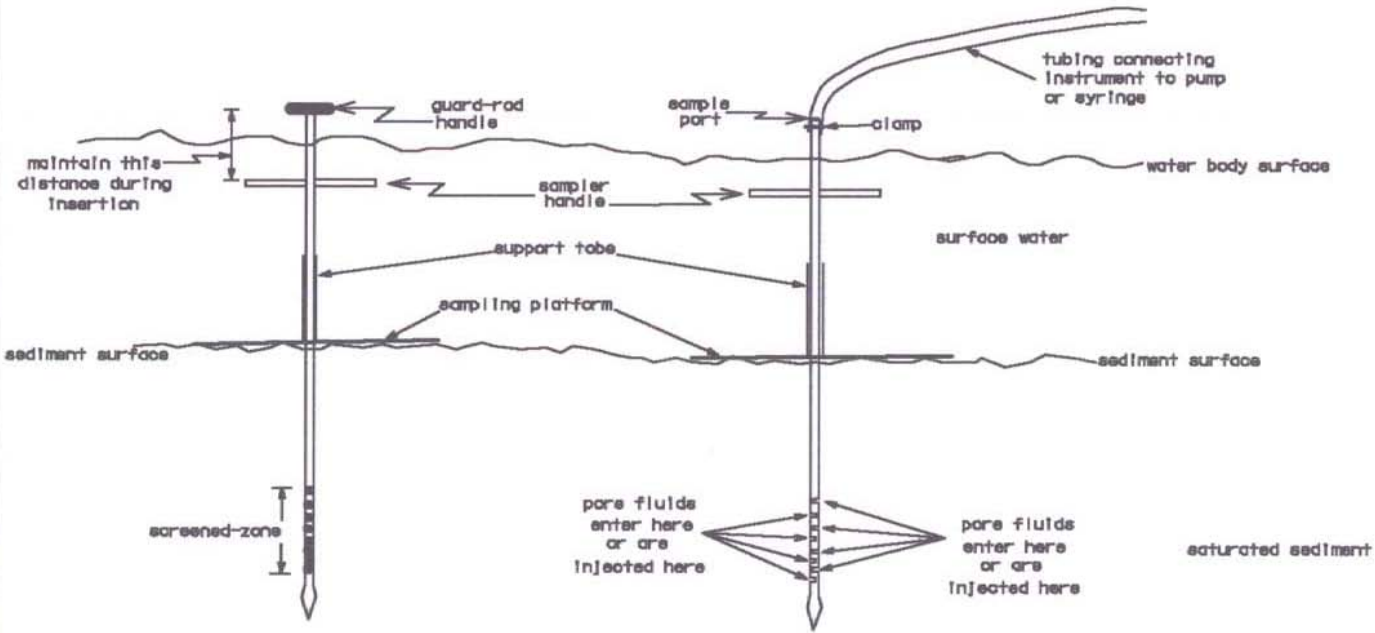

Fig. 3a
configuration when installing in sediments

Fig. 3b
configuration while sampling groundwater

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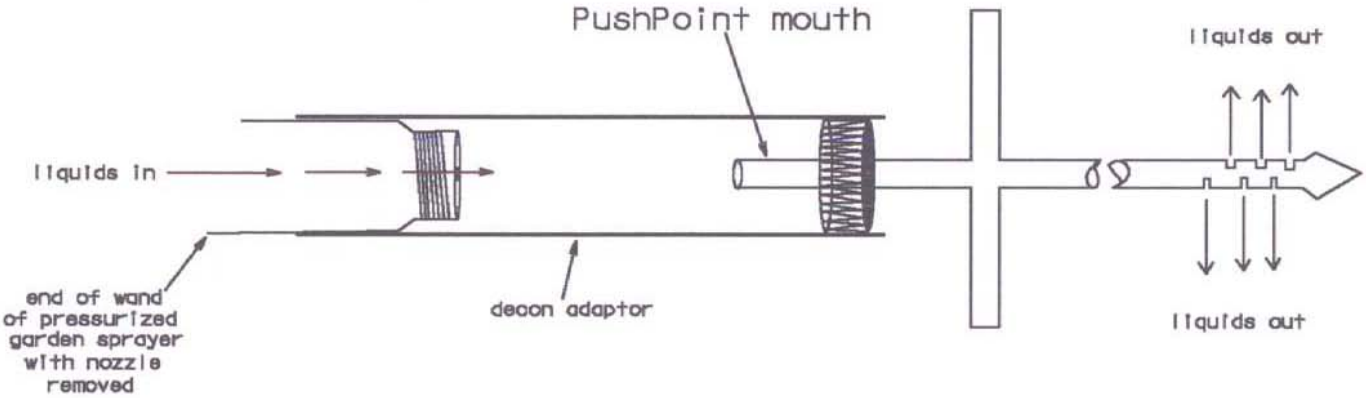
Figure 4

attachment of decon adaptor



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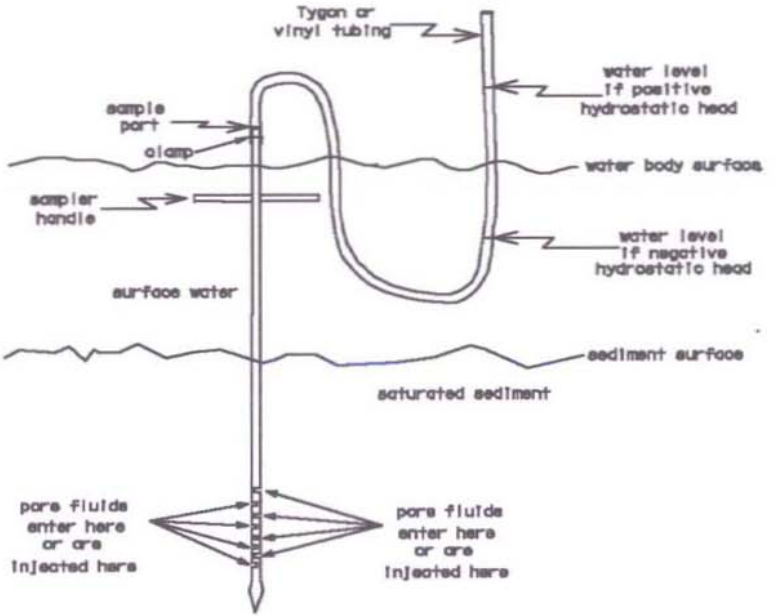

Figure 5

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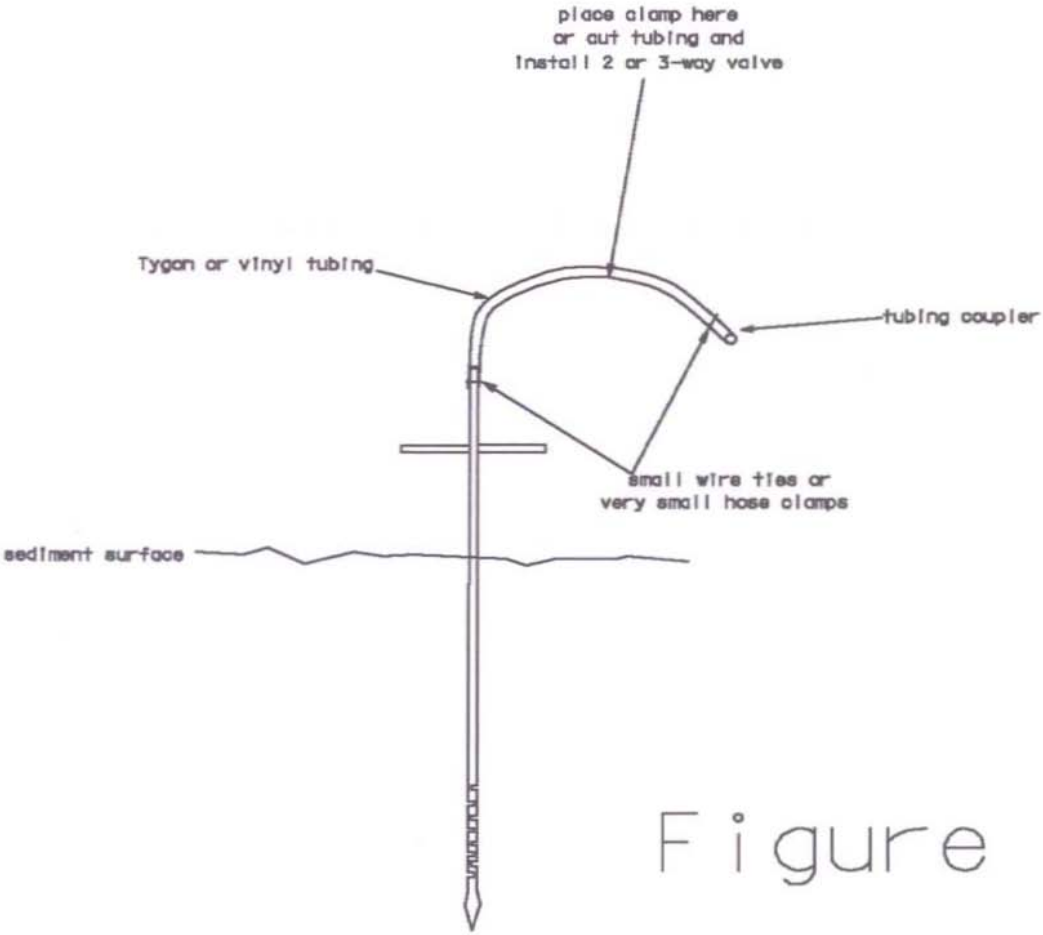

Figure 6

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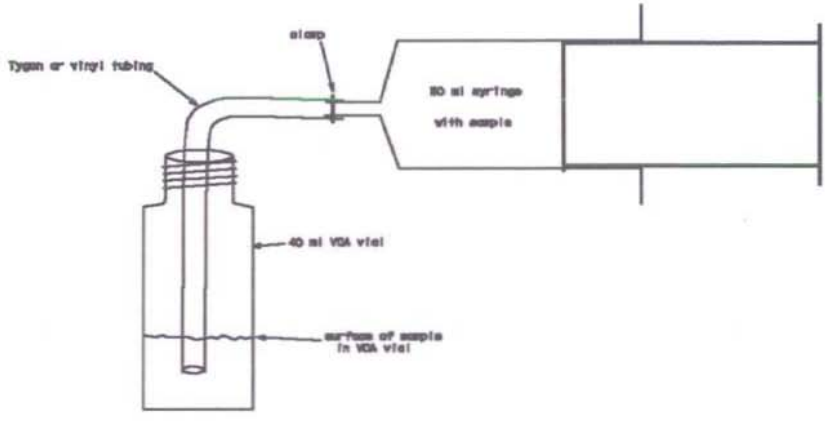
dispensing sample

into VOA vial



sample in VOA vial

awaiting preservation

and capping

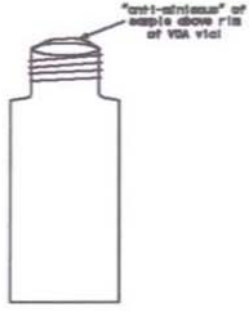


Figure 7

filling VOA vial "headspace free"

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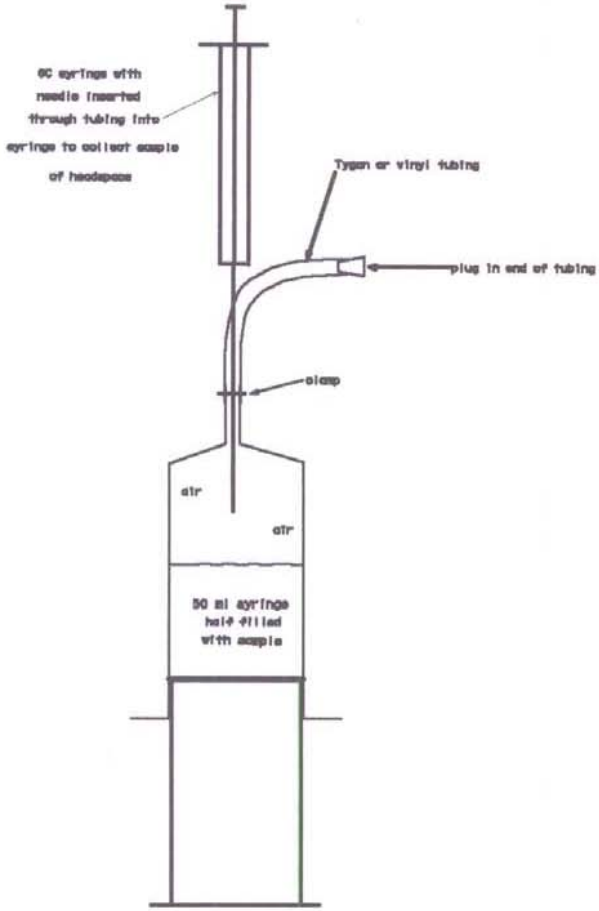

Figure 8

MHE Products, com

http://www-personal.engin.umich.edu/~markhen/insertion.jpg

MHE Products PushPoint Sampler (Patent Pending)
Operators Manual and Applications Guide

Ver. 2.00 8/5/01

Models: PP27, PP14, PPX36, PPX72

Introduction

The groundwater/surface water interface (GSI) has been a research interest of mine for the past decade. This transitional zone is usually rich in biomass and may play a predominant role in the bioattenuation of contaminated groundwater entering surface water bodies. Usually these biologic processes have limited effectiveness in attenuating highly contaminated groundwater, leaving a plume of parent contamination and metabolic byproducts that eventually expresses itself in receiving waters - usually classified as non-point sources of pollution because of the uncertainty of the discharge area. Part of the problem in the detection and study of these plumes is that there were no devices on the market for the rapid, discrete collection of pore water samples. Reliance on conventional technology and techniques to perform a detailed investigation required extensive effort and burdensome equipment.

Through several iterations, I have evolved a simple device for collecting pore water samples from beneath surface water bodies or the beach areas surrounding them. Pore-water sampling using the PushPoint becomes a simple and efficient process, generating a wealth of information and very little waste. If one collects groundwater samples in a transect perpendicular to groundwater flow in the suspected area of plume discharge to an open water body, their analysis yields information about the aerial extent of contaminant discharge to the water body. At this point, additional sampling can complement the initial data and provide the information necessary to map the plume expression in both magnitude and aerial distribution. This is becoming increasingly important to regulators as they decide the ecological impacts of discharging contaminant plumes.

Sampling at each location usually takes 5 minutes, allowing a small crew to collect dozens of samples in an afternoon. These samples can be analyzed in the field for real-time information useful in directing field investigations and research. The work that I have conducted at several contamination sites indicates that many groundwater plumes discharge in surface water bodies in 2-3' of water depth - accessible to investigators wearing hip boots or waders. Many plumes, especially Light Non-Aqueous Phase Liquid (LNAPL) plumes can be delineated by collection of samples in very shallow water or from under beaches. My initial experience has shown that Dense Non-Aqueous Phase Liquid (DNAPL) contaminant plumes express themselves in the shallow, near-shore water as well, even though the on-shore depth of the contaminant mass was deep in the aquifer.

Directions

Look at Figure 1.

As you can see, the PushPoint device is a very simple, precisely machined tool consisting of a tubular body fashioned with a screened zone at one end and a sampling port at the other. The bore of the PushPoint body is fitted with a guard-rod that gives structural support to the PushPoint and prevents plugging and deformation of the screened zone during insertion into sediments. The PushPoint is made of 316 stainless steel assuring compatibility with most sampling environments. The screened-zone consists of a series of interlaced machined slots which form a short screened-zone with approximately 20% open area.

Operation of the device is not difficult. One simply holds the device in a manner that squeezes the two handles towards each other to maintain the guard-rod fully inserted in the PushPoint body during the insertion process (as shown in Figure 2). Holding the device in this manner, push the PushPoint into the

sediments or beach to the desired depth using a gentle twisting motion. When the desired depth is reached (or you hit refusal, usually at an aquitard) remove the guard-rod from the PushPoint body without disturbing the position of the deployed sampler. Once the guard-rod has been removed from the PushPoint, it SHOULD NOT be reinserted into the device until the bore of the PushPoint has been thoroughly cleansed of all sand, silt, etc.

Attach a syringe or peristaltic pump to the PushPoint sample-port (see Figure 3) and withdraw water at a low-flow sampling rate (50-200 ml/min.). The first 20-50 ml of groundwater will be turbid. This is the "development" water and should be discarded. Once non-turbid aliquots have been withdrawn, representative samples can be collected for on-site and off-site analysis.

Cleaning and Maintenance

I cannot stress how important cleanliness and linearity are to the working life of the instrument. The PushPoint was designed as an indefinitely reusable device; potentially able to be reused hundreds of times. The tolerance between the guard-rod and the bore of the PushPoint is very small. Increases in this tolerance through abrasion and damage may allow silty material into this annular space, eventually jamming the guard-rod into the bore - maybe permanently!

Excess wear and abrasion can also be introduced if the guard-rod is inserted frequently when the PushPoint body is bent. All the small bends should be "undone" prior to reinsertion of guard-rod to avoid scraping the sides of the bore causing burrs. Before reinsertion of the guard-rod into the cleaned PushPoint, the device should be "straight as an arrow". Use caution when straightening the screened-zone, it is somewhat delicate without the guard-rod inside it, and can be broken through repeated bending. Similarly, the guard-rod should be bend-free and clean when inserted into the bore of the device. When a clean and straight PushPoint is assembled, the guard-rod should slide fairly easily through the PushPoint bore and its handle should seat against the sampling port.

Clean the exterior of the guard-rod and PushPoint body and screened-zone with a stiff brush and cleaning solution (soapy water).Cleaning and decontamination of the bore of the instrument is easily accomplished using the cleaning adapter provided. Remove the spray nozzle of a "garden sprayer" filled with cleaning solution. Connect the adapter as shown in Figure 4. Insert the sampling port of the PushPoint to the adapter and squirt ~ 100 ml of pressurized cleaning solution backwards through the sampler and out the screened-zone into a waste receptacle. Gently push the guard rod into the bore of the PushPoint to its end to dislodge any bridged material. Re-rinse the bore with cleaning solution. Follow this with a distilled water and/or methanol rinse. Reinsert the guard-rod and the device is ready to be used again.

In some instances it may be advantageous to force the cleaning solution through the screened-zone and out the sampling port. To do so, gently insert the screened-zone of the PushPoint into the cleaning adapter, making sure not to bend the screened-zone, until the entire screened-zone is within the adapter. The screened-zone is somewhat fragile. To avoid damage, do not bend the screen-zone during insertion into the adapter. Squirt cleaning solution through the sampler to a waste receptacle.

Helpful Hints, Information, and Cautions

- Multiple depths can be sampled in one hole if samples are collected, in order, from deepest to shallowest. Insert the sampler using a twisting motion until you reach refusal. Remove the guard-rod. **Do not push the sampler further into the sediments once the guard-rod has been removed as this may damage the screened-zone and plug the device with sediment**. Once sampling has been completed at this deepest depth, the PushPoint can be partially pulled from the hole to a new sampling

elevation. Remember, to prevent screened-zone damage, do not to insert the PushPoint into the sediments without the guard-rod inserted into the PushPoint body. Alternately, multiple holes can be used to collect samples from multiple depths at a particular sampling location. If vertical sampling is performed in one hole, it is recommended that some type be device such as a sampling platform be used to prevent lateral movement and slippage of the PushPoint as sampling is conducted near the top of the hole (see Figure 3). This offsets the leverage of the instrument and reduces hole degeneration. A simple platform would be a plate of steel with a 3/16" dia. hole through its center and would serve the fundamental purpose of maintaining a rigid hole opening . MHE offers a 8" dia., heavy-duty steel sampling platform engineered for the precise sampling depth requirements of field research. If repeated shallow sampling is to be conducted, it may be more convenient to use a shorter sampler (i.e. MHE - PP14").

- If you wish to reuse the PushPoint sampler at a particular sampling location and want to clean the bore quickly while you're there so that the guard-rod may be safely reinserted, you can use a syringe filled with surface water or DI water to backflush the bore several times before reinserting the guard-rod. Use at least 100 ml of water. If you have too much trouble reinserting the guard-rod (i.e. grit), it will be necessary to use the standard cleaning procedures.
- If the screened-zone of the PushPoint becomes plugged while inserted in the sediments due to passage through "something", it is frequently possible to hydraulically/pneumatically shock the screened-zone free of adhering material while it is inserted into the sediments. Attach a large-volume (50 ml) syringe to the sampling port. In a quick motion, pull the syringe plunger most of the way back (creating a vacuum) and then immediately release the plunger - the plunger will slam to a neutral position, sending a shock wave through the bore of the PushPoint and may alleviate the problem.
- The PushPoint can be used as a piezometer to determine the static head of the groundwater and hence, the potential direction of groundwater movement. To do this, a tube is connected to the sample port as shown in Figure 5. A continuous stream of water is established from the syringe (or pump) to the screened-zone by pumping out any air remaining in the PushPoint /tubing. When the tube is disconnected from syringe, the static water level in the tube will represent the static water level at the depth that the screened-zone occupies. In some discharge areas I have found several feet of head differential, and when the tubing is removed, the PushPoint flows like a miniature artesian well.
- It is frequently possible to push the PushPoint through thin lenses of low-permeably material and collect samples from below them and gather valuable geochemical samples. At many of the sites where the PushPoint has been used, sampling from just below a layer of fine sand/silt/clay, one occasionally encounters seemingly large pockets of gas that seem to have coalesced and collected under this less permeable stratum. Analysis of these pockets may provide additional insight to predominant biological processes. It is likely true that the concentration of volatile chemicals in the groundwater has equilibrated with these bubbles which means that their presence in a sampling stream or syringe would not significantly affect the concentration of dissolved volatile organic chemicals (VOC's). In fact, if one assumes that equilibrium conditions exist, the concentration of VOC's in the bubbles is directly related the concentration in the surrounding groundwater. An different condition may exist if the groundwater is supersaturated with bacterial metabolic waste gasses and the negative pressure exerted by the pump (or syringe) initiates degassing of dissolved gasses from the groundwater. In this instance, VOC's would partition from the groundwater to the bubbles as they are formed in the sampling tubing (this is fairly evident if occurring). The consequence of this condition is that part of the dissolved contaminant mass has partitioned into the gas phase and unless the gas-phase is captured, quantified and accounted for, the native VOC concentration of the groundwater is not reflected by analysis of the groundwater alone. If this condition exists, the degassing effect can be minimized by decreasing the sampling rate to a rate more easily yielded by the sampled formation. With experience, it is easy to distinguish which of these conditions (or combination of conditions) exist and to what extent they affect sample quality.
- The internal volume of a PushPoint PP27 is approx. 1.5 ml. A 50 ml syringe full of distilled water, decon water, methanol, etc. will push about 33 volumes through the bore.
- When straightening the screened zone it is sometimes helpful to flush out the bore of the device with a cleaning solution and then insert the guard-rod to the area of the bend in the screened-zone. Gently unbend the portion of the screened-zone nearest the rod and carefully advance the rod to the next bend.

After the rod has been fully inserted into the screened-zone perform the final screened-zone, straightening until the guard-rod slides freely through it.

- If the sampling port of the PushPoint is above the static level of the water body, each time you remove the syringe or pump from the PushPoint sampling port, air will fill the bore of the PushPoint, allowing the water level in the bore to reach its static head. To avoid this plug of air from entering the subsequent syringe, attach a pinch clamp and/or a 3-way valve between the sampling port and the syringe or pump inlet as shown in Figure 7.
- I have conducted dye tests (concentrated uranine dye) by injecting concentrated dye under a perforated 1.5' diameter disk through which the PushPoint was inserted from depths of 3" - 12" into sediments. The goal of these tests was to determine whether or not surface water and dye are drawn into samples collected in near surface sediments (i.e. whether a cone of depression is formed). The results indicated that no surface water is drawn into samples even though sampling was conducted with a peristaltic pump at its maximum rate of 600 ml/min for several minutes.
- I usually couple my field investigations with global positioning system (GPS) identification of the sampling location. If conditions permit, a pin flag can be placed at the sampling location for later location by GPS - I usually use sub-meter grade GPS for this surveying. GPS can then used in the future to relocate previously sampled location even if certain site physical characteristics have changed (eroding shorelines, etc.). If long-term study of a shoreline is planned it will be useful to have an elevation benchmark established on shore that can be used as a reference. The elevation of the sampling locations can then accurately measured. This may be helpful in areas where sediment levels are not stable such as in erosional areas.
- Sampling by syringe has many advantages. This is my preferred field method due to its simplicity and versatility. It is useful to be able to collect several 50 ml syringes full of groundwater, store them on ice and perform the sample transfer to VOA vial, etc. under more controlled conditions. To transfer sample to a VOA vial, place the end of the transfer tube (Figure 8) to the bottom of the VOA vial. Dispense sample into the VOA vial and slowly withdraw the transfer tube from the vial maintaining the mouth of the transfer tube just below the sample surface. When the transfer tube is almost out of the vial, continue to dispense sample and leave an "anti-meniscus" of sample above the rim of the vial. Add several drops of HCl (which will displace a few drops of sample) and cap. If VOC samples are to be collected and/or stored temporarily in a syringe, I recommend 100% polyethylene/polypropylene ("two piece") syringes such as those made by Henke Sass Wolf GMBH (NormJect ®, 50 ml)) configured as shown in Figure 8. From personal experience I have found that small amounts of aromatic compounds (BTEX) can leach from the rubber parts of the rubber-tipped plunger found in common medical syringes. Rubber-tipped plunger syringes have less side-wall resistance and work much smoother than the 100% polyethylene/polypropylene syringes so I use medical syringes for "development" of the PushPoint. Standard medical syringes also work well for collecting samples for non-VOC analysis. I utilize handheld meters for pH, conductivity, redox, DO, etc. One can dispense sample from the syringe into these types of instruments for field measurements. The disposable syringes may be cleaned and reused several times, but because they are a friction fit; prolonged reuse results in scoring of the barrel which eventually causes air leaks.
- The 50 ml, 100% polyethylene/polypropylene "two piece" syringes mentioned above can be purchased directly from MHE, configured with tubing, clamp, and stopper as was the example syringe included with your order, or customized to suit your individual needs. If you would to make your own, the syringes that I am currently using are purchased from National Scientific. The tubing is Tygon 1/4"OD x 1/8" ID. Be sure to use some type of clamp at the tubing mouth to ensure a good seal at the sampler port. The entire syringe assemblies are now available from MHE at a reasonable cost.
- Headspace GC analysis of VOC's can be easily accomplished using 100% polyethylene/polypropylene syringes. Dispense all but 25 ml of the sampled groundwater from the syringe. Refill the syringe to the 50 ml mark with ambient air and then stopper the tubing (and heat the syringe in a water bath if desired) as shown in Figure 9. Shake the syringe assembly to equilibrate the VOC's in the sample with the contained atmosphere. Insert a GC syringe needle through the transfer tube into the sample syringe headspace and withdraw a sample for GC analysis.
- Occasionally a small amount sand and silt is withdrawn into the syringe or pump sampling stream, even after proper "development" of the PushPoint. This may be due to the nature of the geologic formation. This fine material is probably already at equilibrium with the surrounding groundwater and

tests have shown that its presence should not influence analysis of VOC's in the groundwater sample. The sample can be transferred to its shipping container without this silt if the syringe is dispensed in such a manner as to let the solid material settle out in the syringe and not carry over to the shipping vial.

- The PushPoint has been used very successfully for underwater investigations using SCUBA equipment and a series of 100% polyethylene syringes. Once again, GPS equipment was used for location of the position that the divers collected groundwater samples of contaminant plume expression in the lake. Underwater notes (temperature, depth, observations, etc.) can be written directly on the sample syringes if they are pre-prepared with a strip of Scotch Magic Transparent Tape applied down the syringe body and writing is done with a soft pencil.
- The PushPoint may be used to inject nutrients or dyes into the sediments for field trials of biologic or geochemical testing or tracing groundwater paths. Simply insert the PushPoint to the desired depth, and after the guard-rod has been removed, connect a syringe or pump and slowly inject the desired fluid into the sediments, perhaps followed by a small amount of native groundwater to flush the instrument.
- The PushPoint is constructed of 316 stainless steel as mentioned previously. There are two places where the stainless parts are silver soldered together, the handle of the guard-rod and the handle on the PushPoint sampler. If the investigator is collecting samples for metals analysis, the silver solder joint on the guard-rod may impart trace levels metallic residue to the sampling port mouth. This has never caused a problem but the possibility exists. The silver solder that I use is Safety-Silv 45 which contains silver (45%), copper (30%),and zinc (25%). MSDS available upon request. In the unlikely event that these metals cause contamination of samples, MHE can produce specialty guard-rods that are not silver soldered. What can I say, these devices were originally built to sample for VOC's.
- These devices can be dedicated as semi-permanent underwater monitoring devices. If a PushPoint is inserted to the desired depth through a plate (such as the sampling platform mentioned earlier) that can lock the sampler at the correct insertion depth, a vinyl cap can be placed over the mouth of the sampler, and the sampler can be dedicated to that location so that future samples can be withdrawn when desired.
- It has been useful to carry several samplers in "quivers" made of 2" PVC tubing….one tube for (10-15) clean/assembled samplers and one tube for used samplers and their separated guard-rods. This arrangement protects both the investigators and the instruments.
- I have been using a Myron 6P Ultrameter available from www.ColeParmer.com for most of my work. This instrument measures pH, specific conductance, ORP, temperature, and TDS using only a few milliliters of sample and is perfectly suited to samples dispensed by syringe. The instrument is waterproof to 3 m. There will soon be a link on the MHEproducts.com web page.
- I have been using the Chemetrics Vacu-Vial technique (www.Chemtrics.com) in conjunction with PushPoint sampling. I use this for dissolved oxygen and dissolved iron measurements. Many other analytical tests are also available such as nitrate, phenols, etc.. This analytical technique also works very well with samples collected in syringes. The sample is dispensed into a plastic cone until it overflows. The tip of an evacuated ampoule containing the necessary reagents is broken off at the bottom of the cone allowing the vacuum in the ampoule to pull in a aliquot of sample that has not contacted the atmosphere. The ampoule is shaken and is then is then placed as a cuvette into a handheld spectrophotometer. The results are nearly instantaneous and are displayed in ppm. There will soon be a link on the MHEproducts.com web page.

I hope that users will find many useful and innovative uses for this device. If you have other helpful information, uses, and advice concerning these samplers, please write or e-mail suggestions to me for inclusion in future manual revisions. I have finally started a web site: www.MHEproducts.com and have posted pictures, new products, and the latest version of this manual.

Thanks. MHE

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Figure 1

the PushPoint sampler

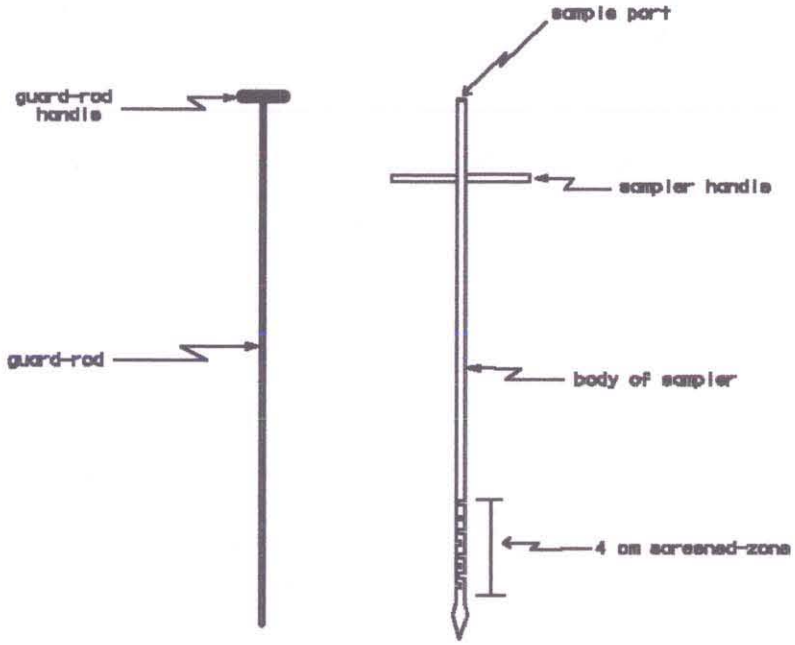

Fig. 1a

disassembled sampler

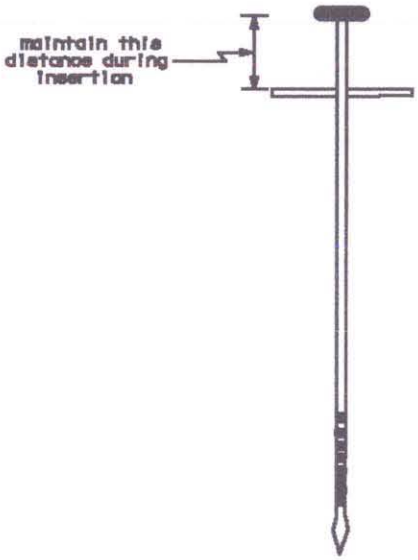

Fig. 1b

assembled sampler

MHE Products.com

Figure 2

grasp instrument firmly
and squeeze two handles
together to maintain
this distance while
inserting into sediments

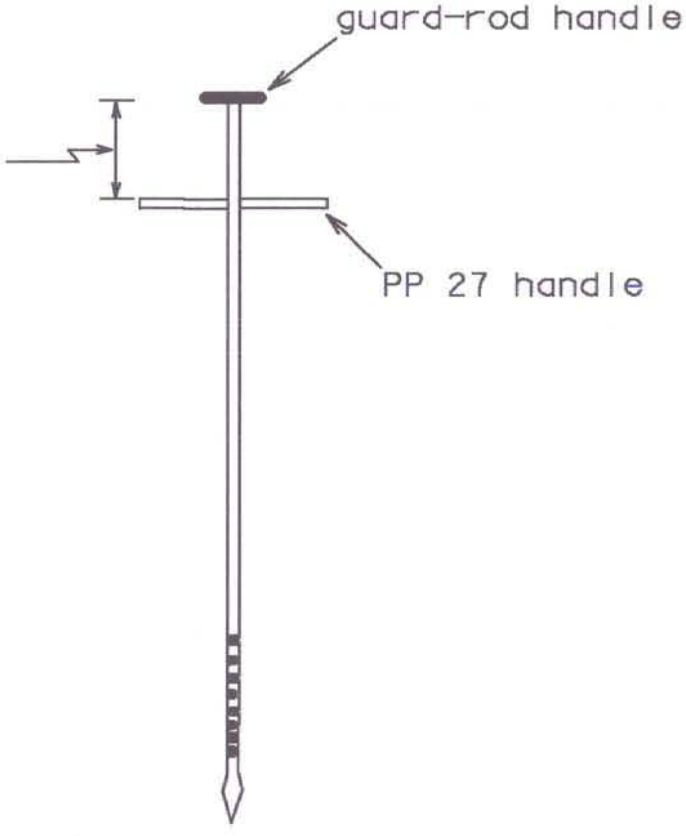

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Figure 3

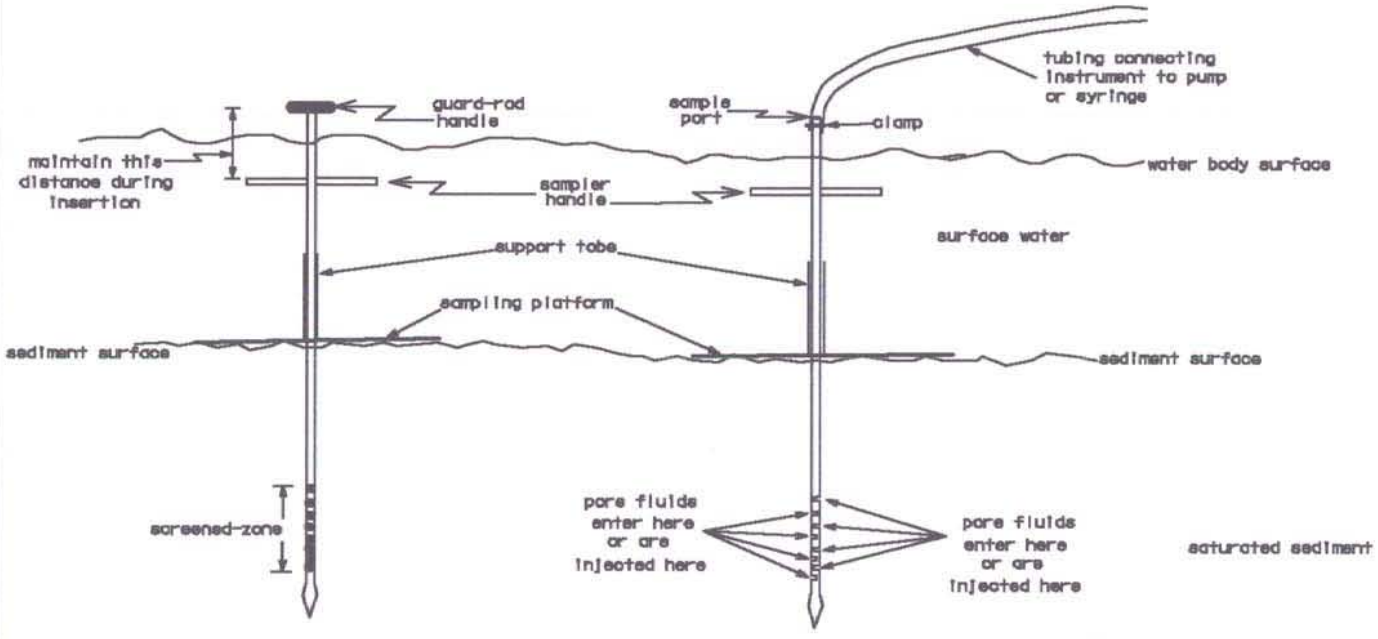


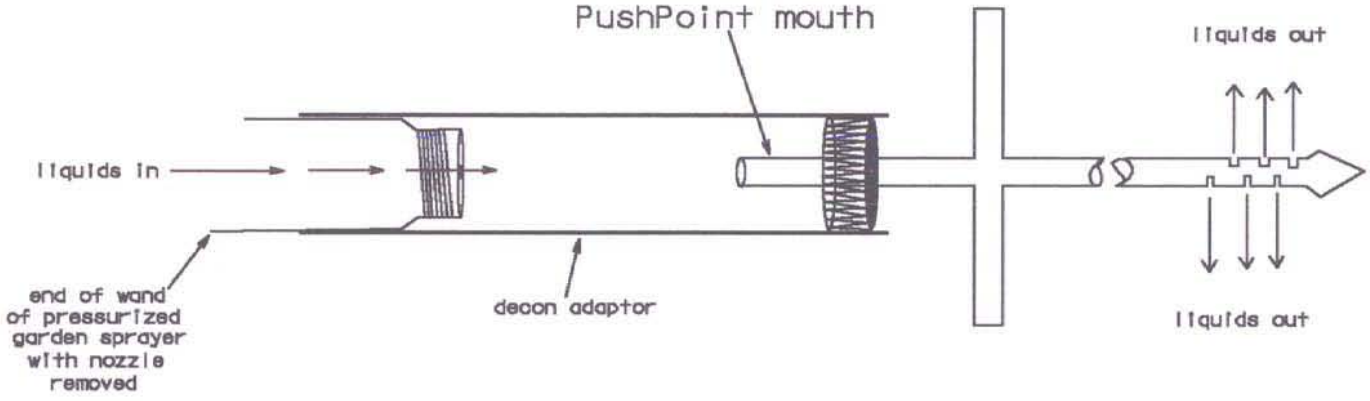
Fig. 3a
configuration when installing in sediments

Fig. 3b
configuration while sampling groundwater

MHE Products.com

Figure 4

attachment of decon adaptor



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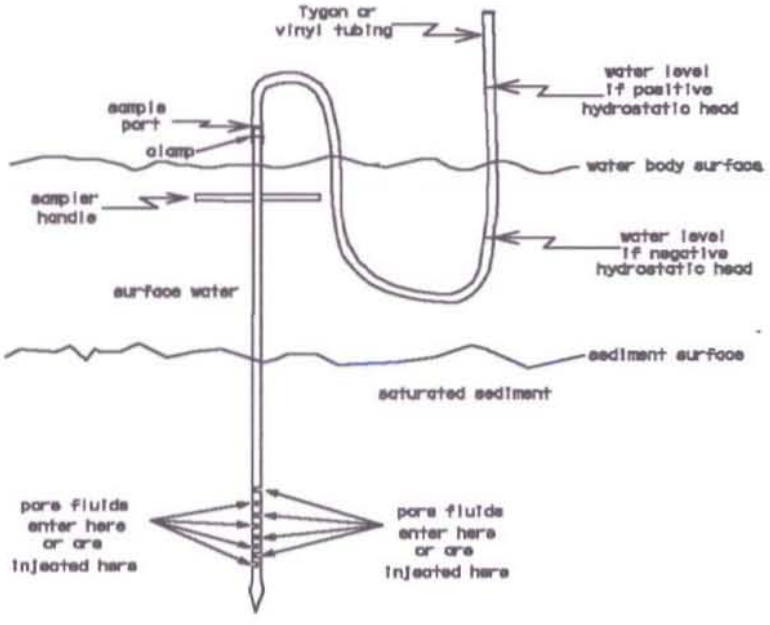

Figure 5

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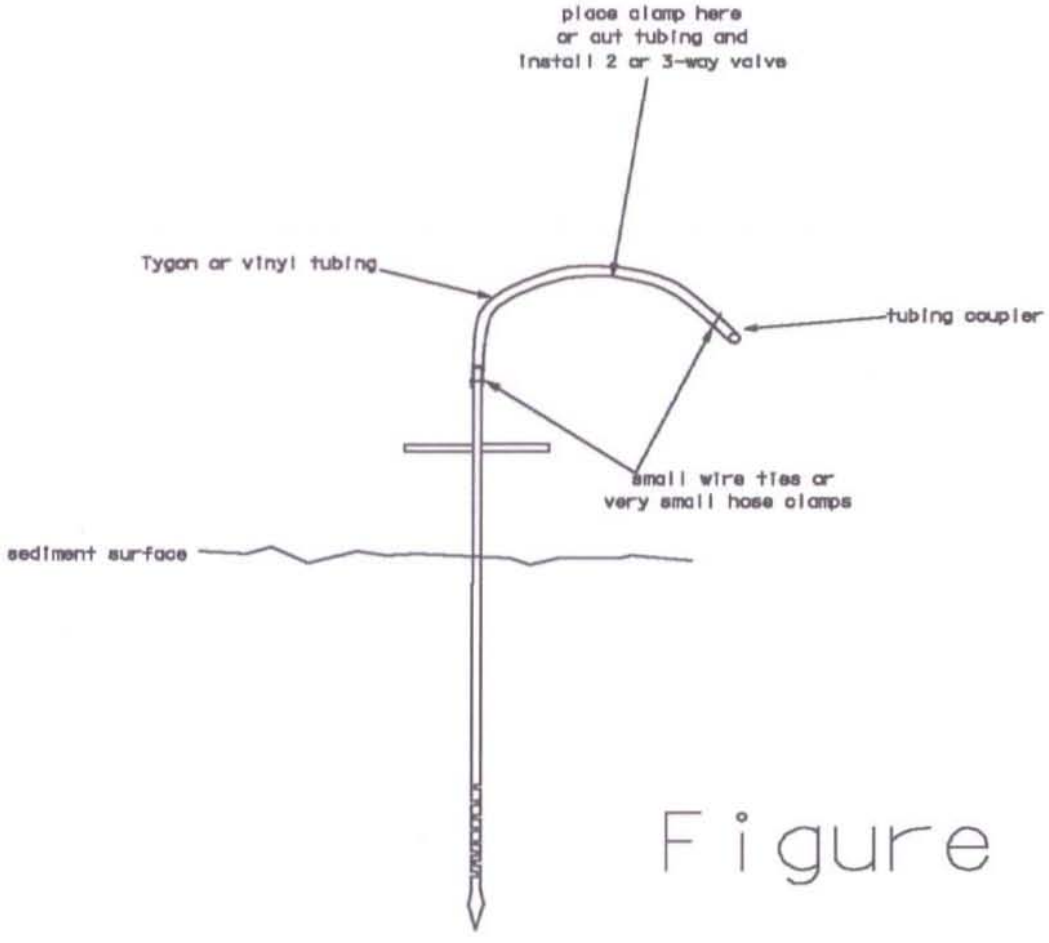
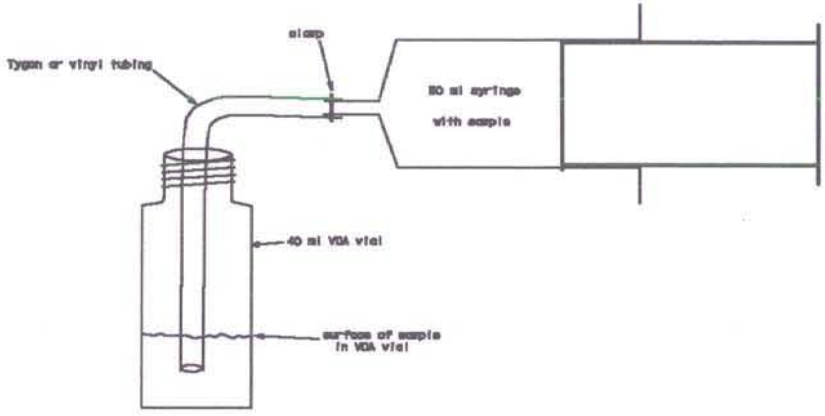


Figure 6

MHE Products.com

dispensing sample

into VOA vial



sample in VOA vial

awaiting preservation

and capping

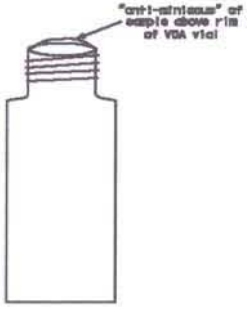


Figure 7

filling VOA vial "headspace free"

MHE Products.com

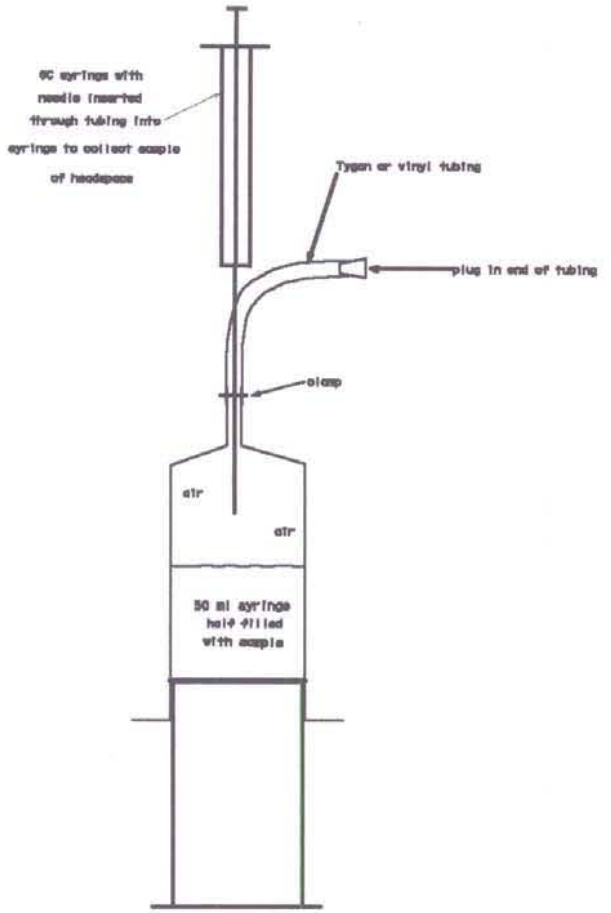


Figure 8

MHE Products, com

CONTRACT CHANGE ORDER

CONTRACTOR: Advanced American Diving Service, Inc.

AGENCY: Oregon Department of Environmental Quality

CONTRACT NO. 5123-PA

CHANGE ORDER NO. 5

DATE November 10, 2005

PROJECT: McCormick and Baxter Sediment Cap Completion

This Change Order amends any or all preceding contract documents and correspondences which pertain to the subject of this order and authorizes the following changes in the work:

1. Expand the Record Drawing Bathymetric Survey, which is specified in Section 02145 of the Contract Documents, to cover all submerged portions of the site that can be surveyed with multi-beam sonar.

2. This work shall be in accordance with the Contractor's proposal of November 10, 2005.

3. The lump sum price for this work is $4,378.00, which includes $1,000.00 lump sum for engineering consulting and support, $2,980.00 for increased in-field surveying, and a 10% profit markup on both items.

ORIGINAL NOT-TO-EXCEED ("NTE") CONTRACT PRICE: $430,000.00

BALANCE OF PREVIOUS CHANGES:

TOTAL EXTRA: 207,231.90

TOTAL CREDIT: $0.00

TOTAL" NTE" CONTRACT PRICE BEFORE THIS CHANGE: $637,231.90

THIS CHANGE ORDER:

TOTAL EXTRA: $4,378.00

TOTAL CREDIT $0.00

TOTAL "NTE" CONTRACT PRICE TO DATE: $641,609.90

SIX HUNDRED FORTY ONE THOUSAND, SIX HUNDRED NINE DOLLARS AND NINETY CENTS..

AGENCY

BY: _____ DATE: _____

TITLE: _____

CONTRACTOR

BY: _____ DATE: _____

TITLE: _____

STATE OF OREGON - DAS

BY: _____ DATE: _____

TITLE: _____

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FIELD MEMOS-DIRECTIVES

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333 Southwest Fifth Avenue, Suite 608
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

Sediment Cap Completion
McCormick & Baxter Creosoting Co. Site

EE-AAC-01

To: Mike Nelson and Mike Johns
Advanced American Diving

From: Andrew Murphy
Oversight Supervisor
Ecology and Environment, Inc.

Cc: Kevin Parrett, Project Manager, DEQ
Steve Campbell, Contract Manager, DEQ
John Montgomery, Project Manager, E&E
Alexander Whitman, Senior Engineer, E&E

Date: August 18, 2005,

Re: Revision to Specification Section 02230,

This field memo memorializes the previously delivered revision to Specification Section 02230. This change to the Contract Documents will be officially made in a future 'no cost' change order.

Thank you,

Andrew Murphy
Ecology and Environment, Inc.
Date: August 18, 2005,

Received by:
Date:

ecology and environment, inc.
International Specialists in the Environment

333 Southwest Fifth Avenue, Suite 608
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

Sediment Cap Completion
McCormick & Baxter Creosoting Co. Site

EE-AAC-02

To: Mike Nelson and Mike Johns
Advanced American Diving

From: Andrew Murphy
Oversight Supervisor
Ecology and Environment, Inc.

Cc: Kevin Parrett, Project Manager, DEQ
Steve Campbell, Contract Manager, DEQ
John Montgomery, Project Manager, E&E
Alexander Whitman, Senior Engineer, E&E

Date: August 25, 2005,

Re: A Request for a Cost Proposal for the Delivery and Placement of additional 6-inch minus rock within the Sediment Cap,

Advanced American Diving is here by directed to supply a cost proposal to DEQ/E&E for the delivery and placement of additional 6-inch minus rock as discussed during the weekly meeting on 8/24/05. The cost proposal shall be for the delivery of 400 tons of rock and the placement of the rock using the crane barge with associate personnel for one day.

Thank you,

Andrew Murphy
Ecology and Environment, Inc.
Date: August 25, 2005,

Received by:
Date:

ecology and environment, inc.
International Specialists in the Environment

333 Southwest Fifth Avenue, Suite 608
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

Sediment Cap Completion
McCormick & Baxter Creosoting Co. Site

EE-AAC-03

To: Mike Nelson and Mike Johns
Advanced American Diving

From: Andrew Murphy
Oversight Supervisor
Ecology and Environment, Inc.

Cc: Kevin Parrett, Project Manager, DEQ
Steve Campbell, Contract Manager, DEQ
John Montgomery, Project Manager, E&E
Alexander Whitman, Senior Engineer, E&E

Date: September 7, 2005,

Re: DEA dive survey support under CO#2

AAC is here by given authorization to continue DEA dive survey support (production of as-built drawings) under Change Order #2 in excess of the accepted cost proposal amount.

Thank you,

Andrew Murphy
Ecology and Environment, Inc.
Date: September 7, 2005,

Received by:
Date:

ecology and environment, inc.
International Specialists in the Environment

333 Southwest Fifth Avenue, Suite 608
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

Sediment Cap Completion
McCormick & Baxter Creosoting Co. Site

EE-AAC-04

To: Mike Nelson and Mike Johns
Advanced American Diving

From: Andrew Murphy
Oversight Supervisor
Ecology and Environment, Inc.

Cc: Kevin Parrett, Project Manager, DEQ
Steve Campbell, Contract Manager, DEQ
John Montgomery, Project Manager, E&E
Alexander Whitman, Senior Engineer, E&E

Date: September 8, 2005,

Re: The purchase of organoclay composite material

AAC is here by given authorization to purchase seven rolls of oganoclay composite material from CETCO Corp. The details such as material specifications and vendor contact will be provided by DEQ.

Thank you for your cooperation,

Andrew Murphy
Ecology and Environment, Inc.
Date: September 8, 2005,

Received by:
Date:

ecology and environment, inc.
International Specialists in the Environment

333 Southwest Fifth Avenue, Suite 608
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

Sediment Cap Completion
McCormick & Baxter Creosoting Co. Site

EE-AAC-05

To: Mike Nelson and Mike Johns
Advanced American Diving

From: Andrew Murphy
Oversight Supervisor
Ecology and Environment, Inc.

Cc: Kevin Parrett, Project Manager, DEQ
Steve Campbell, Contract Manager, DEQ
John Montgomery, Project Manager, E&E
Alexander Whitman, Senior Engineer, E&E

Date: September 15, 2005,

Re: DEA Survey Scope

In order to update, clarify, correct, and complete the Sediment Cap Record Drawings produced by DEA on January 11, 2005 (file name: REMT2ab.dwg) E&E and DEQ request that David Evans and Associates (DEA) as a subcontractor to AAC perform the following survey and associated services:

8 hours of field survey work, including equipment:
Take GPS coordinates on several cap features, including but not limited to the 'blister repair areas' from the 2004 sediment cap construction, any locations currently showing oil sheen, and along the ACB edge everywhere other than in Willamette Cove to verify the DEA November 2004 Survey of the ACB Edge. This work is to be performed under the direction of an E&E representative. E&E and DEQ believe that these locations will be unsubmerged and it will be possible to perform the survey from dry land.

16 hours of office work:
Provide draft and revised electronic files and hardcopy drawings of the sediment cap features including the results of the survey described above and the recent dive survey to E&E and DEQ for review. Note that most of the Hypack data collected during the dive survey was converted into a CAD drawing and organized by Mike Mutschler and Vanessa Rayner in DEA's office on 08/26/05.

After review and approval, DEA is to submit final electronic files and hardcopy drawings to E&E and DEQ.

Andrew Murphy
Ecology and Environment, Inc.

Received by: Date:

ecology and environment, inc.
International Specialists in the Environment

333 Southwest Fifth Avenue, Suite 608
Portland, Oregon 97204
Tel: (503) 248-5600, Fax: (503) 248-5577

Sediment Cap Completion
McCormick & Baxter Creosoting Co. Site

EE-AAC-06

To: Mike Nelson and Mike Johns
Advanced American Diving

From: Lenna Kennard
Oversight Staff
Ecology and Environment, Inc.

Cc: Kevin Parrett, Project Manager, DEQ
Steve Campbell, Contract Manager, DEQ
John Montgomery, Project Manager, E&E
Alexander Whitman, Senior Engineer, E&E

Date: October 4, 2005,

Re: Buoy Locations

Advanced American Diving is here by directed to supply, by e-mail or FAX, an hourly price for a boat with operator to Steve Campbell, copying Alexander Whitman and Kevin Parrett. If the rate is reasonable, the approval to go ahead with the following shall be e-mailed within 4 working hours.

Provide a boat with operator and a person from DEA to determine the locations of 19 buoys attached to sampling devices. Slack in the buoy's anchoring line shall be removed before sampling so the buoy is directly above the anchoring point. The buoys are scheduled to be removed starting early Monday October 11, 2005, so this work must be performed on October 8, 2005 or earlier.

This work shall be charged at hourly rates under Change Order No. 1, as augmented by the price requested above. The work shall be invoiced under Change Order No. 1. The not-to-exceed amount for Change Order No. 1 remains unchanged.

Lenna Kennard
Ecology and Environment, Inc.

Received by: Date:

H Organizational Chart

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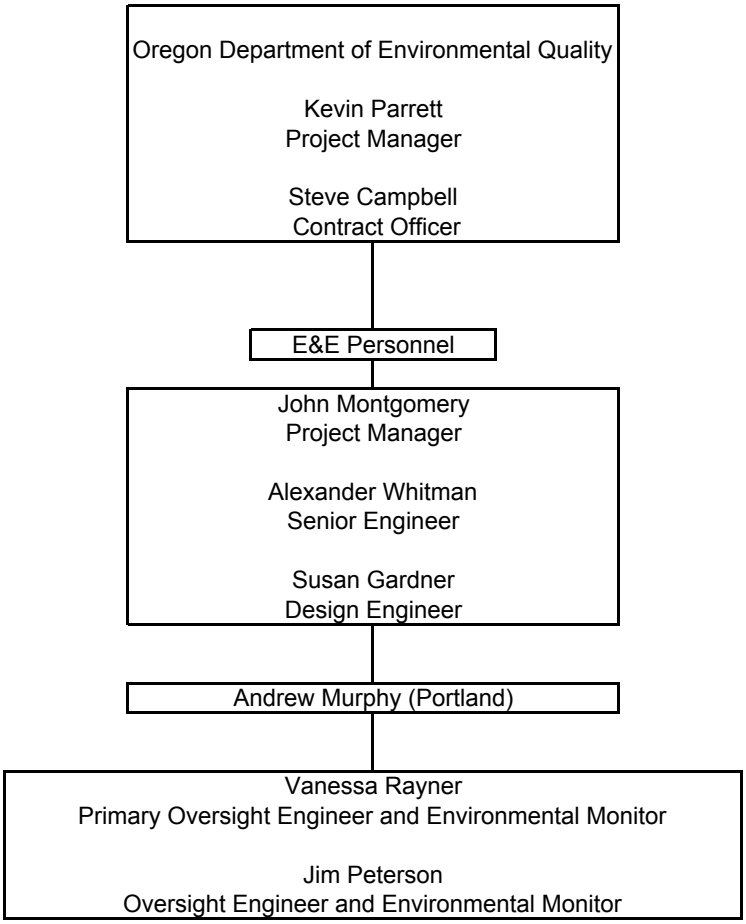
OVERSIGHT PERSONNEL ORGANIZATION CHART

SEDIMENT CAP COMPLETION
MCCORMICK AND BAXTER CREOSOTING COMPANY SITE
PORTLAND, OREGON



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Material Tracking Spreadsheets

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McCormick & Baxter - Sediment Cap Completion
Import Material Load Ticket Summary

MATERIAL DESCRIPTION: SAND

AAC GIVEN BARGE LOAD NUMBER	DATE	TICKET NUMBER	SOURCE	QUANTITY (TONS)	TOTAL CUMULATIVE QUANTITY (TONS)	NOTES
1	8/8/05	1922716	MBI	630.00	630.00	
2	8/8/05	1922715	MBI	700.00	1,330.00	
3	8/11/05	2038408	MBI	780.00	2,110.00	
4	8/11/05	2038410	MBI	685.00	2,795.00	
5	8/17/05	2038940	MBI	721.00	3,516.00	
6	8/17/05	2038941	MBI	941.00	4,457.00	
7	8/19/05	2039166	MBI	931.00	5,388.00	
8	8/19/05	2039133	MBI	731.00	6,119.00	
11-1	8/30/05	2040335	MBI	597.00	6,716.00	
TOTAL					**6,716.00**	

MATERIAL DESCRIPTION: 2 1/2" - 1/2" CRUSHED ROCK (GRAVEL FILTER)

AAC GIVEN BARGE LOAD NUMBER	DATE	TICKET NUMBER	SOURCE	QUANTITY (TONS)	TOTAL CUMULATIVE QUANTITY (TONS)	NOTES
9-2	8/25/05	1858329	MBI	111.00	111.00	
TOTAL					**111.00**	

MATERIAL DESCRIPTION: 6" COBBLE ROCK

AAC GIVEN BARGE LOAD NUMBER	DATE	TICKET NUMBER	SOURCE	QUANTITY (TONS)	TOTAL CUMULATIVE QUANTITY (TONS)	NOTES
9-1	8/25/05	1858328	MBI	671.00	671.00	
11-2	8/31/05	1858479	MBI	109.00	780.00	
12	8/31/05	1858479	MBI	800.00	1,580.00	
13	9/1/05	1858608	MBI	892.00	2,472.00	
TOTAL					**2,472.00**	CO #2: Furnish an additional 400 tons of 6" minus rock; CO #3: Furnish an additional 600 tons of riprap and an additional 200 tons of 6" minus rock.

MATERIAL DESCRIPTION: RIPRAP

AAC GIVEN BARGE LOAD NUMBER	DATE	TICKET NUMBER	SOURCE	QUANTITY (TONS)	TOTAL CUMULATIVE QUANTITY (TONS)	NOTES
10	8/24/05	7755-780 (43 Truck Load Ticket Numbers)	Westside Rock	610.72	610.72	
14	9/6/05	7977-8035 (47 Truck Load Ticket Numbers)	Westside Rock	601.39	1,212.11	CO #3: Furnish an additional 600 tons of riprap and an additional 200 tons of 6" minus rock.
TOTAL					**1,212.11**	

Sand Placement Tracking

Grid Cell	Area (sq ft)	Depth (ft)	Volume (CY)	Weight (TN)	Full Bucket Loads Required to Complete Grid Cell	Sand Placement Date	AAC Reported Estimate of Volume Placed (CY)
A3	703	2	52	70	9	08/10/05	50
A4	1757	3.75	244	329	44	08/10/05	290
B2	952	2	71	95	13	08/09/05, 08/10/05	69
B3	2510	3	279	377	51	08/09/05, 08/10/05	198
B4	2510	3.75	349	471	63	08/12/05	338
B5	1372	2	102	137	18	08/15/05	108
C1	240	2	18	24	3	08/17/05	21
C2	2340	2	173	234	32	08/09/05, 08/10/05	170
C3	2510	1.8	167	226	30	08/09/05, 08/10/05	211
C4	2510	1.8	167	226	30	08/12/05	178
C5	2451	2	182	245	33	08/12/05, 08/15/05	192
C6	2060	2	153	206	28	08/15/05	153
C7	1738	2	129	174	23	08/15/05	116
D1	1540	2	114	154	21	08/17/05	114
D2	2510	2	186	251	34	08/17/05, 08/18/05	191
D3	2510	2	186	251	34	08/18/05	226
D4	2510	2	186	251	34	08/18/05	204
D5	2510	2	186	251	34	08/22/05	205
D6	2510	2	186	251	34	08/23/05	191
D7	2510	2	186	251	34	08/31/05	185
E1	1062	2	79	106	14	08/17/05	78
E2	2609	2	193	261	35	08/18/05	150
E3	2663	2	197	266	36	08/18/05	215
E4	2532	2	188	253	34	08/18/05, 08/22/05	220
E5	2510	2	186	251	34	08/22/05	193
E6	2499	2	185	250	34	08/23/05, 08/31/05	183
E7	2468	2	183	247	33	08/31/05	178
F4	1624	2	120	162	22	08/23/05	136
F5	2044	2	151	204	28	08/22/05, 08/23/05	156
F6	746	2	55	75	10	08/23/05	62
Total:	61010		4852	6550			4978

Barge Load	Barge Load Quantity Reported on Material Receipt (TN)	Volume (CY)	Bucket Location Color	Sand Placement Location	Sand Placement Locations Completed	Actual Sand Placement Location Volume Required (CY)	AAC Reported Sand Placement Location Volume Placed (CY)
1	630	467	Red	C2, C3, B2, B3	None	690	467
2	700	519	Green	C2, C3, B2, B3	C2, C3, B2, B3	223	180
				A3, A4	A3, A4	296	339
3	780	578	Navy Blue	B4, C4, C5	B4, C4	698	578
4	685	507	Teal Blue	C5	C5	119	130
				C6, C7, B5	C6, C7, B5	383	377
5	721	534	Magenta and Yellow	C1, D1, E1, D2, E2	C1, D1, E1, D2	590	534
6	941	697	Yellow	E2	E2	56	20
				D3, E3, D4, E4	D3, E3, D4	757	677
7	931	690	Maroon	E4	E4	80	185
				D5, E5, F5	D5, E5	523	505
8	731	541	Sky Blue	F5	F5	18	49
				F4, F6, D6, E6	F4, F6, D6	578	494
11-1	597	442	Black	E6	E6	83	78
				E7, D7	E7, D7	369	363
Total:	6716	4975					4976

Note: 1. Sand Density = 1.35 TN/CY

2. The clamshell bucket holds 5.5 CY of material when full flush (8 tons per bucket to be conservative). AAC calculated the amount of 5.5-CY bucket loads needed to complete each grid cell. Some bucket loads contained more or less than 5.5 CY, depending on the amount of material left on the barge and the amount the crane operator was able to grab. AAC's Engineer, Jake Duyck, worked with the crane operator to count bucket loads while noting approximately how many CY each bucket actually contained, adjusted the number of bucket drops accordingly, and spread bucket drops out across each grid cell evenly, in order to achieve an approximate thickness of two feet.

3. AAC placed the amount of bucket loads required to complete each grid cell and achieve adequate thickness - see E&E's hard copy of the grid used to track sand placement, AADS's core results and AAC's Hypack file in addition to this speadsheet.

Gravel Filter Placement Tracking

Grid Cell	Area (sq ft)	Depth (ft)	Volume (CY)	Weight (TN)	Full Bucket Loads Required to Complete Grid Cell	Gravel Filter Placement Date	AAC Reported Estimate of Volume Placed (CY)
A3	703	0.33	9	12	1.58	08/27/05	12
A4	260	0.33	3	4	0.58	08/27/05	3
B2	590	0.33	7	10	1.32	08/27/05	23
B3	326	0.33	4	5	0.73	08/27/05	5
C1	240	0.33	3	4	0.54	08/27/05	3
C2	390	0.33	5	7	0.88	08/27/05	8
D1	1151	0.33	14	19	2.58	08/27/05	8
E1	1045	0.33	13	17	2.35	08/27/05	11
E2	815	0.33	10	14	1.83	08/27/05	11
Total:	5520		68	92			82

Note: 1. Gravel Filter Density = 1.35 TN/CY

2. The clamshell bucket holds 5.5 CY of material when full flush (8 tons per bucket to be conservative). AAC calculated the amount of 5.5-CY bucket loads needed to complete each grid cell. Some bucket loads contained more or less than 5.5 CY, depending on the amount of material left on the barge and the amount the crane operator was able to grab. AAC's Engineer, Jake Duyck, worked with the crane operator to count bucket loads while noting approximately how many CY each bucket actually contained, adjusted the number of bucket drops accordingly, and spread bucket drops out across each grid cell portion evenly, in order to achieve adequate thickness.

3. Barge Load # 9 contained 671 tons of 6-inch minus rock (Barge Load # 9-1) and 111 tons (82 CY) of gravel filter (Barge Load # 9-2).

4. AAC placed the amount of bucket loads required to complete each grid cell and achieve adequate thickness - see E&E's hard copy of the grid used to track gravel filter placement and AAC's Hypack file. Unlike with sand placement, the bucket drops are only marking where AAC began dropping the gravel filter and were used mostly just to keep track of how many buckets went into that grid cell. AAC spread the gravel filter across the area as evenly as possible to achieve a thickness of four inches. AAC was also using a feature in Hypack that would save a trail for a short period of time showing where the bucket had travelled. This would help AAC place the gravel filter in a particular area, but the trails would erase after a few minutes so that the screen didn't become too cluttered.

Riprap Placement Tracking

Grid Cell or Location	Area (sq ft)	Depth (ft)	Volume (CY)	Weight (TN)	Full Box Loads Required to Complete Grid Cell or Location	Riprap Placement Date	AAC Reported Estimate of Material Placed (TN)
A3	703	2	52	78	8.7	08/29/05	611
A4	260	2	19	29	3.2	08/29/05	
B2	590	2	44	66	7.3	08/29/05	
B3	326	2	24	36	4.0	08/29/05	
C1	240	2	18	27	3.0	08/29/05	
C2	390	2	29	43	4.8	08/29/05	
D1	1151	2	85	128	14.2	08/29/05, 08/30/05	
E1	1045	2	77	116	12.9	08/29/05, 08/30/05	
E2	815	2	60	91	10.1	08/29/05, 08/30/05	
Total:	5520		409	613			611
Change Order 3 Upstream Riprap Area	2600	2	193	289	21	09/07/05	600
Change Order 3 Downstream Riprap Area	2840	2	210	316	23	09/07/05, 09/08/05	
Total:	5440		403	604			600

Note: 1. Riprap Density = 1.50 TN/CY

2. AAC estimated that the skip box holds approximately 9 tons of material (conservative estimate). AAC calculated the amount of 9-ton box loads needed to complete each grid cell. AAC's Engineer, Jake Duyck, worked with the crane operator to spread the riprap out across each grid cell portion evenly, in order to achieve adequate thickness.

3. AAC placed the amount of box loads required to complete each grid cell or area and achieve adequate thickness - see E&E's hard copy of the grid used to track riprap placement and AAC's Hypack file. As in gravel filter placement, the bucket drops are only marking where AAC began dropping the riprap and were used mostly just to keep track of how many boxes went into that grid cell or area. AAC spread the riprap across the area as evenly as possible to achieve a thickness of two feet. AAC was also using a feature in Hypack that would save a trail for a short period of time showing where the box had travelled. This would help AAC place the riprap in a particular area, but the trails would erase after a few minutes so that the screen didn't become too cluttered.

Barge Load	Barge Load Quantity Reported on Material Receipt (TN)	Volume (CY)	Box Load Color	Riprap Placement Location	Riprap Placement Location Volume Required (CY)	Approximate Riprap Placement Location Volume Placed (CY)	AAC Reported Riprap Placement Location Volume Placed (CY)
10	611	407		A3, A4, B2, B3, C1, C2, D1, E1, E2	409	407	407
14	600	400		New Upstream Area	193	400	400
				New Downstream Area	210		
Total:	1211	807					807

6-Inch Minus Rock Placement Tracking

Grid Cell or Location	Area (sq ft)	Depth (ft)	Volume (CY)	Weight (TN)	Full Bucket Loads Required to Complete Grid Cell or Location	6-Inch Minus Rock Placement Date	AAC Reported Estimate of Volume Placed (CY)
A3	703	0.67	17	23	3	08/27/05	20
A4	1757	0.67	43	59	8	08/27/05	50
B2	952	0.67	24	32	4	08/27/05	21
B3	2510	0.67	62	84	11	08/27/05	45
B4	2510	0.67	62	84	11	08/27/05, 09/09/05	60
B5	1372	0.67	34	46	6	09/09/05	40
C1	240	0.67	6	8	1	08/27/05	6
C2	2340	0.67	58	78	11	08/27/05	55
C3	2510	0.6	56	75	10	08/27/05	53
C4	2510	0.6	56	75	10	08/27/05, 09/01/05	58
C5	2451	0.67	61	82	11	08/27/05, 09/01/05, 09/09/05	71
C6	2060	0.67	51	69	9	09/09/05	57
C7	1738	0.67	43	58	8	09/09/05	47
D1	1540	0.67	38	51	7	08/27/05	33
D2	2510	0.67	62	84	11	08/27/05, 09/01/05	63
D3	2510	0.67	62	84	11	09/01/05	59
D4	2510	0.67	62	84	11	09/01/05	60
D5	2510	0.67	62	84	11	09/09/05	76
D6	2510	0.67	62	84	11	09/06/05, 09/09/05	45
D7	2510	0.67	62	84	11	09/06/05	50
E1	1062	0.67	26	35	5	08/27/05	28
E2	2609	0.67	64	87	12	08/27/05	55
E3	2663	0.67	66	89	12	09/01/05	59
E4	2532	0.67	63	84	11	09/01/05	67
E5	2510	0.67	62	84	11	09/06/05, 09/09/05	66
E6	2499	0.67	62	83	11	09/09/05	78
E7	2468	0.67	61	82	11	09/06/05	63
F4	1624	0.67	40	54	7	08/31/05, 09/09/05	31
F5	2044	0.67	50	68	9	08/31/05, 09/09/05	44
F6	746	0.67	18	25	3	08/31/05, 09/09/05	26
Total:	61010		1494	2017			1485

Change Order 3 6-Inch Minus Area (Upstream of Sediment Cap Completion Area)	6100	0.67	151	203	27	09/01/05	133
Spud Locations	-	-	-	-	-	09/13/05	130
Change Order 3 Upstream 6-Inch Minus Area (8' x 20' area near Dive Survey Item H2)	160	0.67	4	5	1	09/13/05	14.4
Change Order 3 Downstream 6-Inch Minus Area (20' x 60' area in "ACB Area 2")	1200	0.67	30	40	5	09/13/05	72
Total:							1834

Note: 1. 6-Inch Minus Rock Density = 1.35 TN/CY

2. The clamshell bucket holds 5.5 CY of material when full flush (8 tons per bucket to be conservative). AAC calculated the amount of 5.5-CY bucket loads needed to complete each grid cell. Some bucket loads contained more or less than 5.5 CY, depending on the amount of material left on the barge and the amount the crane operator was able to grab. AAC's Engineer, Jake Duyck, worked with the crane operator to count bucket loads while noting approximately how many CY each bucket actually contained, adjusted the number of bucket drops accordingly, and spread bucket drops out across each grid cell evenly, in order to achieve adequate thickness.

Barge Load	Barge Load Quantity Reported on Material Receipt (TN)	Volume (CY)	6-Inch Minus Rock Placement Location	6-Inch Minus Rock Placement Locations Completed	6-Inch Minus Rock Location Volume Required (CY)	AAC Reported 6-Inch Minus Rock Placement Location Volume Placed (CY)
9-1	671	497	A3, A4, B2, B3, B4, C1, C2, C3, C4, C5, D1, D2, E1, E2	A3, A4, B2, B3, C1, C2, C3, D1, E1, E2	635	497
11-2	109	81	F6, F5, F4	None	109	81
12	800	593	CO 3 6-Inch Minus Area	CO 3 6-Inch Minus Area	151	133
			C4, C5, D2, D3, D4, D6, D7, E3, E4, E5, E7	C4, D2, D3, D4, E3, E4	637	460
13	892	661	B4, B5, C5, C6, C7, D5, D6, E5, E6, F4, F5, F6	B4, B5, C5, C6, C7, D5, D6, E5, E6, F4, F5, F6	428	447
			Spud Locations	Spud Locations	-	130
			CO 3 US 6-Inch Minus Area	CO 3 US 6-Inch Minus Area	4	14.4
			CO 3 DS 6-Inch Minus Area	CO 3 DS 6-Inch Minus Area	30	72
Total:	2472	1831				1834

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Environmental Monitoring Report

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McCormick and Baxter Creosoting Company Portland, Oregon Sediment Cap Completion Sewer Line Repair Area Environmental Monitoring Report

January 2006

Prepared for:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

Prepared by:

ECOLOGY AND ENVIRONMENT, INC.

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List of Abbreviations and Acronyms

AAC	Advanced American Construction, Inc.
AAD	Advanced American Diving Service, Inc.
BNSF	Burlington Northern Santa Fe
BO	Biological Opinion for the Construction of the Sediment Cap at the McCormick and Baxter Creosoting Company Superfund Site
cfs	cubic feet per second
CQAP	Construction Quality Assurance Plan
CRD	Columbia River Datum
DEQ	Department of Environmental Quality
E & E	Ecology and Environment, Inc.
EM	Environmental Monitor
EMRP	Environmental Monitoring and Reporting Plan
EMR	Environmental Monitoring Report
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
McCormick & Baxter	McCormick & Baxter Creosoting Company Superfund Site
NAPL	nonaqueous phase liquid
NGVD	National Geodetic Vertical Datum
NOAA Fisheries	National Marine Fisheries Service
OHW	ordinary high water mark
PAHs	polynuclear aromatic hydrocarbons

List of Abbreviations and Acronyms (cont.)

PCP	pentachlorophenol
RA	Remedial Action
ROD	Record of Decision
USGS	U.S. Geological Survey
WQCs	Water Quality Certifications
WQMP	Water Quality Monitoring Plan
WQSs	Water Quality Standards

1 Introduction

Ecology and Environment, Inc. (E & E), under contract with the Oregon Department of Environmental Quality (DEQ) to perform engineering and construction contractor oversight services, prepared this *Environmental Monitoring Report* (EMR) as part of E & E's comprehensive monitoring and reporting plan for completion of the sediment cap at the McCormick & Baxter Creosoting Company Superfund Site (McCormick & Baxter) in Portland, Oregon. This EMR was prepared in accordance with and to fulfill the reporting requirements prescribed in the *Biological Opinion for the Construction of the Sediment Cap at the McCormick and Baxter Creosoting Company Superfund Site* (BO). The BO was prepared by the National Marine Fisheries Service (NOAA Fisheries) in response to a request by the U.S. Environmental Protection Agency (EPA) for formal consultation under the Endangered Species Act (ESA). Construction activities associated with completion of the sediment cap commenced on August 9, 2005 and concluded on September 14, 2005. The construction activities were related to sediment cap completion in the sewer line force main area, following repair activities conducted by the City of Portland. Change Order work pertaining to the installation of organoclay mats underneath the Burlington Northern Santa Fe (BNSF) railroad bridge commenced on October 20, 2005 and concluded on October 25, 2005.

Reporting information detailed in this document is as follows:

- Site description,
- Overall project description,
- Monitoring requirements,
- Notification requirements and procedures, and
- Monitoring results.
- Details of turbidity monitoring and water quality issues associated with the McCormick & Baxter site and the construction and installation of the sediment cap.

- Photographic documentation of environmental conditions at the project site before, during, and after project completion. Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.

E & E oversight personnel used the Environmental Monitoring and Reporting Plan (EMRP) included in the Construction Quality Assurance Plan (CQAP) as a guidance document for monitoring activities. This document was maintained on-site throughout construction for easy reference.

2 Site Description

The McCormick & Baxter site is located next to the Willamette River in Portland, Oregon, downstream of Swan Island and upstream of the St. Johns Bridge, at 6900 North Edgewater Street. The upland portion of the site is directly adjacent to and east of the Willamette River, which flows to the northwest in the site vicinity. The site's surface topography is a generally flat terrace formed by dredged material placed sometime in the early 1900s. The site footprint encompasses approximately 43 acres on land (upland area) and 17 acres in the river (in-water area). The upland portion lies between a 120-foot-high bluff near the northeast border and a 20-foot-high bank along the Willamette River to the southwest. The site is bordered to the north and south by inactive industrial properties and by a residential area on the bluff.

The Willamette River is a major river that flows through Portland and is the only surface water body at the site. The site is approximately 7 miles upstream of the confluence of the Willamette River and the Columbia River (river milepost 7). The Willamette River is not used as a drinking water source downstream of the site. The stream reach along the site is approximately 1,500 feet wide and U.S. Geological Survey (USGS) gauge records in Portland indicate that during the summer months (i.e., June to August from 1972 to 2003), the average discharge was approximately 12,000 cubic feet per second (cfs). The average discharge in winter months (i.e., December to February) was approximately 63,000 cfs. Channel sounding maps indicate that the navigation channel next to the site is maintained at a width of approximately 600 feet and a maximum depth of 40 feet below the Columbia River Datum (CRD).

Shallow groundwater gradients generally extend from the bluff toward the river. Intermediate and deep zone groundwater surface elevations and gradients indicate groundwater flow toward the river in these zones.

In the early 1900s, the first industrial structure, a sawmill, was built on the site. In 1944, the McCormick & Baxter Creosoting Company began wood-treating operations that continued until October 10, 1991.

The McCormick & Baxter property was formerly a highly developed industrial site with little terrestrial wildlife habitat. Site investigation between 1983 and

1990 revealed many releases of chemical compounds to soil, groundwater, and sediment. Contaminants detected at the site include polynuclear aromatic hydrocarbons (PAHs) (comprising about 85% of creosote constituents), pentachlorophenol (PCP), arsenic, chromium, copper, and zinc. In 1990, the wood treatment operations ceased and early remedial actions (RAs) were initiated to remove process equipment, piping, tanks, treatment formulations, and other items.

The Record of Decision (ROD) identifies selected remedies for contaminated soil, groundwater, and sediment. Over the past several years, a number of inspections, investigations, and RAs have been performed at the site. Phase I of the soil remedy was performed in 1999, where the most highly contaminated soil was excavated to 4 feet below ground surface and disposed of off site as hazardous waste. Clean, sandy fill was placed in those areas that were excavated. Phase II of the soil remedy was performed in 2005, which entailed the installation of a soil cap over the entire upland portion of the site.

Groundwater remedies included extracting and treating groundwater (implemented in 1994 and suspended in September 2000) and the installation of a vertical barrier wall in 2003 to reduce off-site migration of groundwater contaminated with nonaqueous phase liquid (NAPL). Groundwater/NAPL extraction has occurred since 1994, first as an automated process, then transitioning to manual methods in 1998 when NAPL recovery diminished. Ongoing monitoring ensures that site-specific alternate concentration limits are met at compliance monitoring locations.

The remedy for sediment, as specified in the ROD, entailed the installation of a sediment cap over near-shore contaminated sediment and the initiation of long-term monitoring, operation and maintenance, and institutional controls. The majority of the sediment cap was constructed in 2004, with completion of the sediment cap over the sewer line repair area occurring in 2005.

3 Overall Project Description

Former wood-treating operations at the site resulted in widespread contamination of soil, sediment, and groundwater across much of the property and into the adjacent Willamette River. Contaminants of concern included carcinogenic PAHs, PCP, arsenic, and dioxins/furans.

The objectives of the sediment cap are to prevent humans and aquatic organisms from coming into direct contact with contaminated sediments and to minimize releases of contaminants from sediment that might result in further contamination of the Willamette River. In 2004, an approximate 22-acre sediment cap was installed below the ordinary high water mark (OHW) extending to the approximate 40-foot depth line within the river channel. The cap extends the length of the river frontage of the property, under the BNSF railroad bridge, and downstream into Willamette Cove to the northwest. Due to the discovery of two City of Portland pressurized sewer lines found exposed within the sediment capping area just upstream of the BNSF railroad bridge, construction activities were halted in an established no-work zone that continued up the bank and covered an approximate 120-foot swath of the sewer lines. The City of Portland repaired the sewer lines in July 2005. Sediment cap completion construction activities performed by the remedial contractor, Advanced American Diving Service, Inc. (AAD), doing business as Advanced American Construction, Inc. (AAC), for the project consisted of the actions listed below.

Sediment Cap Completion

- The sediment cap was completed in 2005, covering an approximate 61,010 square-foot area that was avoided during sediment cap construction in 2004. A 24-inch layer of sand placed over the entire area, followed by an 8-inch layer of 6-inch minus rock below – 10 CRD, and a 4-inch layer of gravel filter followed by a 24-inch layer of riprap above – 10 CRD, were placed over the sediment cap completion area.

Organoclay Mat Installation

- Organoclay mats were placed approximately 115 feet along the shore underneath the BNSF railroad bridge, between ACB edges. The mats were placed

perpendicular to the shore beginning at + 3 CRD, and extend 50 feet down slope. An approximate 6-inch layer of sand was placed prior to organoclay mat placement to fill voids within the previously placed 6-inch minus rock armoring, an approximate 12-inch layer of sand was placed on top of the organoclay mats, an approximate 12-inch layer of 6-inch minus rock was placed over the sand, and an approximate 24-inch layer of riprap was placed over the 6-inch minus rock above – 7 CRD.

- Organoclay mats were placed approximately 300 feet along the shore southwest of monitoring well clusters 44 and 45. The mats were placed perpendicular to the shore, and extend 60 feet down slope. An approximate 6-inch layer of sand was placed prior to organoclay mat placement to fill voids within the previously placed 6-inch minus rock armoring, an approximate 12-inch layer of sand was placed on top of the organoclay mats, an approximate 4-inch layer of 3.5-inch minus rock was placed over the sand, and an approximate 12-inch layer of 10-inch minus rock was placed over the 3.5-inch minus rock.

4 Monitoring Requirements of the EMRP

4.1 Daily Construction Monitoring and Reporting

Daily monitoring related to the day-to-day changes in site conditions, progress of construction, and location or locations of construction activities. The means and methods employed by AAC were recorded on the Daily Construction Report Form and are included in the Construction Summary Report being prepared separately from this report.

4.2 Environmental Monitoring

Throughout construction an environmental monitor (EM) monitored the contractor's means and methods for compliance with the *Contract Documents*, the BO, the *Water Quality Certifications* (WQCs), and applicable local, state, and federal regulations regarding protection of the environment in and around the project site area. The monitoring activities were recorded on the Daily Environmental Monitoring Report Forms (Appendix B) and water quality monitoring conducted during in-water work was recorded on the Daily Turbidity Report Forms (Appendix C).

4.2.1 Pre-construction Activities

Before construction commenced, the following actions were accomplished.

- The EM ensured that a sufficient supply of oil absorbent boom and pads were on-site.
- E & E/DEQ retained an emergency spill contractor (West Coast Marine Cleaning Services) for boom maintenance and cleanup services.

4.2.2 During Construction Activities

Whenever any sheen was observed, E & E personnel:

- Were prepared to contact E & E's/DEQ's marine spill response contractor (West Coast Marine Cleaning Service) for containment boom deployment/maintenance and cleanup assistance in case the sheen worsened and did not dissipate in less than five minutes,

- Were prepared to direct the contractor, who assisted with turbidity monitoring, to assist with containment and/or cleanup in case the sheen worsened and did not dissipate in less than five minutes,

- Were prepared to make the appropriate notifications as described in Section 5, below, and

- Documented the sheen observed in field logbooks, on the *Daily Environmental Monitoring Report Forms* included in Appendix B, and in the Daily Construction Summary Report.

4.3 River Stage and Shoreline Monitoring

E & E oversight personnel monitored the river stage during in-water work periods with approximate CRD levels marked on the BNSF railroad bridge pier, river stage prediction websites and a tide chart. The tidal information was recorded on the *Daily Environmental Monitoring Form*. No high-water events occurred during completion of the sediment cap.

4.4 The Water Quality Monitoring Plan (WQMP)

To ensure that the State of Oregon's Water Quality Standards (WQSs) were met during construction and to implement the reasonable and prudent measures as prescribed in the BO, E & E developed the WQMP, which was included in the EMRP. The on-site EM used this plan to assist with monitoring of the contractor's turbidity-minimizing procedures and construction techniques. Turbidity measurements were taken to monitor the construction activities. If turbidity readings had measured in excess of the turbidity criteria or improper construction techniques had been observed, proper notification and actions would have been taken. This plan was available on-site for inspection upon request by EPA or NOAA Fisheries.

4.4.1 Turbidity Monitoring

Turbidity was monitored during in-water construction activity. A turbidity background monitoring point was established at a representative (undisturbed) location a minimum of 100 feet upstream from the sediment cap boundary. The background measurement location varied because of tidal influences. Turbidity sampling for compliance was monitored at points 100 feet downstream from the sediment cap boundary. Water samples/readings were collected/taken at the bottom, mid-level, and top of the water column but not closer than within 5-foot intervals. Six readings were taken from each depth and averaged for a more accurate measurement.

Turbidity measurements were taken and recorded at least once every four hours during in-water work. On any day in-water work occurred, the first sample was taken at four hours after the initiation of activity and once at each four-hour interval thereafter. If the turbidity level had exceeded turbidity criteria, initial notifications would have been made to the oversight supervisor and directly to AAC's

superintendent. Following notifications, more readings would have been taken at the upstream and downstream sampling locations. If the upstream/downstream readings did not account for the excessive turbidity, another reading at the same location of the initial readings would have been taken within 30 minutes of the first. If these readings were also above the criteria, the EM would have notified the oversight supervisor. The turbidity-causing work would then have been shut down or modified, and the turbidity would have been measured at 30-minute intervals until it came down to acceptable levels.

Visual monitoring of turbidity levels occurred at least once every four hours (two-hour lag time from turbidity readings) during in-water work. Visual observations were recorded on the daily turbidity report. If the EM had observed turbidity at levels that were estimated to be approaching the turbidity action level, a turbidity measurement would have been taken. If the initial readings had indicated that the turbidity level was above the turbidity action level criteria the EM would have followed the procedures described above.

Daily turbidity measurements, including information identifying all sampling locations and times, were emailed to Nancy Munn of NOAA Fisheries, and Kevin Parrett of DEQ (nancy.munn@noaa.gov; parrett.kevin@deq.state.or.us).

4.4.2 Response to Non-compliance with Water Quality Standards

If the construction activities had caused a water quality problem (exceedance of WQSs) or a failure to comply with conditions of the WQC, or the construction activities had resulted in distressed or dying fish, the EM would have informed the oversight supervisor immediately.

4.5 Endangered Species

If dead or injured salmon had been observed, the EM would have taken photos and contacted the E & E fisheries biologist to confirm species identification. If a distressed, injured or dead listed fish had been found the EM would have followed notification guidelines listed in Section 5 below.

If dead specimens had been handled, care would have been taken to preserve biological material in the best possible state for later analysis of cause of death. In conjunction with the preservation of biological materials from a dead animal, if the animal had been a listed species, the finder would have been responsible for following instructions provided by NOAA Fisheries Law Enforcement to ensure that evidence intrinsic to the specimen was not unnecessarily disturbed.

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5 Notification Requirements and Procedures

5.1 Notification Requirements

The following were the minimum notification requirements for E & E oversight personnel during construction:

- The EPA required immediate notification upon exceedance or failure to comply with conditions of the WQC. To fulfill this requirement the EM would have notified the DEQ Project Manager (Kevin Parrett) immediately. Monitoring information would have been provided immediately if a violation of WQSs had occurred, during a fish kill, or if a failure to comply with other WQS conditions had occurred.

- The DEQ and NOAA Fisheries required immediate notification when a dead, injured, or sick, endangered, or threatened species specimen was reported by construction personnel and positively identified.

- When significant sheen was observed during construction activities or if a release of oil or hazardous material occurred, E & E personnel were required to ensure that proper notification of the DEQ, the Project Manager, the Oregon Emergency Response System, and the National Response Center was made.

5.2 Notification Procedures

To facilitate and accelerate the process of making appropriate notifications, E & E oversight personnel attached a notification call list to the back leaf of their field notebooks. Oversight personnel had to have either a cell phone, or be in radio contact with an individual carrying a cell phone, or be in radio contact with the E & E field office, which was equipped with a phone.

5.3 Identification and Notification

The EM was responsible for identification of species if a dead, sick, or injured fish or animal had been found on-site during construction. If a dead, injured, or sick, endangered, or threatened species specimen had been located, initial notification would have been made to the NOAA Fisheries Law Enforcement Office, Vancouver Field Office, 600 Maritime, Suite 130, Vancouver, Washington 98661 (telephone: [360] 418-4246). After this initial notification of the NOAA Fisher-

ies Law Enforcement Office, Nancy Munn (NOAA) and Kevin Parrett (DEQ) would also have been notified.

6 Monitoring Results

6.1 Fish Exclusion

Fish removal activities were to occur in shallow water work areas (less than 10 feet deep) only if any of the requirements of the Clean Water Act, Section 401, the WQC, or the NOAA Fisheries BO could not be met through other corrective measures.

6.2 Turbidity Exceedances

There were no occurrences of turbidity readings in excess of the specified criteria associated with the completion of the sediment cap. In the event of an exceedance, the EM would have followed the guidelines noted in Section 4.4.1 of this document.

6.3 Photographic Documentation

As part of the reporting requirements listed in the EMRP, E & E has submitted photographic documentation of the site during construction. This documentation can be found in Appendix A.

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7 References

Ecology and Environment, Inc. (E & E) 2005. *Environmental Monitoring and Reporting Plan Amendment*, *Sediment Cap Completion*, submitted to the Oregon Department of Environmental Quality (DEQ). Portland, Oregon.

Ecology and Environment, Inc. (E & E) 2004. *Environmental Monitoring and Reporting Plan*, *Sediment Cap Construction*, submitted to the Oregon Department of Environmental Quality (DEQ). Portland, Oregon.

Ecology and Environment, Inc. (E & E) 2004. *Fish Exclusion Plan*, *Sediment Cap Construction*, submitted to the Oregon Department of Environmental Quality (DEQ). Portland, Oregon.

National Oceanic and Atmospheric Administration Fisheries. 2003. *Biological Opinion for Construction of the Sediment Cap at the McCormick and Baxter Creosoting Company Superfund Site, Willamette River, Portland, OR*, submitted to the U.S. Environmental Protection Agency, Oregon Operations Office.

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A Photographic Documentation

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Photo 1 AAC placing sand with clamshell bucket just below water surface within yellow containment boom.

Direction: *Southeast*

Photo 2 Foam from sand placement contained within yellow containment boom.

Direction: *North*

Photo 3 AAC placing sand with clamshell bucket.

Direction: *East*

Photo 4 AAC placing riprap with skip box.

Direction: *Northeast*

Photo 5 AAD cutting geotextile fabric and placing in skiff.

Direction: *Southwest*

Photo 6 AAD cutting PVC pipe markers from the embayment at very low water.

Direction: *East*

Photo 7 AAD collecting previously cut geotextile fabric pieces and placing them in a trash bag.

Direction: *West*

Photo 8 AAC collecting yellow containment boom upon completion of in-water work.

Direction: *North*

Photo 9 AAD placing 50'x15' CETCO organoclay mats with skiff after mats are loaded in with crane barge and spreader bar.

Direction: *South*

Photo 10 All CETCO organoclay mats placed at approximately + 3 CRD.

Direction: *West*

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B Daily Environmental Monitoring Reports

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Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/10/09

	High Tide	Low Tide
Time	9:34	16:58
Height	3.47'	1.73'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 13:00

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time:

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time:

Water Quality (Observable Sheen)

Observable sheen in construction area? Slight
Observable sheen outside construction area? Slight
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Sand was placed approximately 200' SE of the railroad bridge at McCormick & Baxter Creosoting Co. Yellow containment boom was placed all around the placement area, and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes (No)
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes (No)
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

Everything was fine.

Observations

none, other than slight sheen observed around crane barge.

Corrective Actions

Sheen was too slight to take corrective action and it dissipated fairly quickly.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Raymer
Date: 8/12/05

	High Tide	Low Tide
Time	11:16	18:05
Height	2.93'	1.94'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 11:00

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No
Observable sheen outside construction area? No
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Sand was placed approximately 200' SE of the railroad bridge at McCormick + Baxter Co. Yellow containment boom was placed all around the placement area, and oil absorbent boom was onboard in case of sheen or NAPL release

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes (No)
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes (No)
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

Everything was fine.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/15/05

	High Tide	Low Tide
Time	15:57	11:49
Height	2.59'	1.79'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 10:30

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No
Observable sheen outside construction area? No
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Sand was placed approximately 200' SE of the railroad bridge at McCormick + Baxter Creosoting Co. property. Yellow containment boom was placed all around the placement area, and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes (No)
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes (No)
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/17/05

	High Tide	Low Tide
Time	~~6:07pm~~	~~2:10pm~~
Height	3.02'	1.40'
	17:41	13:21

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading: [ ]
Time: N/A – See observations for comments

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading: [ ]
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading: [ ]
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No
Observable sheen outside construction area? No
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Sand was placed approximately 200' SE of the railroad bridge at McCormick & Baxter Co. property. Yellow containment boom was placed all around the placement area, and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes (No)
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? (Yes) No
If yes, did you note the time, direction and location? (Yes) No
Photolog reference numbers: 101 – 0576

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

Note: AAC placed sand from 12:30 to 15:30 today. EYE took one turbidity reading at 14:15 and observed that turbidity appeared under background every half hour or so.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/18/05

	High Tide	Low Tide
Time	18:19	14:02
Height	3.29'	1.32'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 10:00

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 13:30

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No
Observable sheen outside construction area? No
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Sand was placed approximately 200' SE of the railroad bridge at the McCormick & Baxter Sites. Yellow containment boom was placed all around the placement area, and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes (No)
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? (Yes) No
If yes, did you note the time, direction and location? (Yes) No
Photolog reference numbers: 101-0577

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Raymer
Date: 8/22/05

	High Tide	Low Tide
Time	8:17	16:16
Height	3.81'	1.44'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 10:15

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No
Observable sheen outside construction area? No
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Sand was placed approximately 200' SE of the railroad bridge at the McCormick & Baxter Site. Yellow containment boom was placed all around the placement area, and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes (No)
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes (No)
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/23/05

	High Tide	Low Tide
Time	9:04	16:40
Height	3.57'	1.54'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 10:30

Does the turbidity appear greater than background downstream of construction? Yes (No)
If yes was circled, then a reading is required. Result of reading: N/A
Time: 14:30

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Sand was placed approximately 200' SE of the railroad bridge at the McCormick & Baxter Site. Yellow containment boom was placed all around the placement area, and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes (No)
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes (No)
If yes, did you note the time, direction and location? Yes (No)
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/27/2005

	High Tide	Low Tide
Time	13:59	9:37
Height	2.80'	1.83'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 10:20

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 14:20

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Gravel filter and 6-inch minus rock was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site. Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/29/2005

	High Tide	Low Tide
Time	16:31	11:32
Height	3.13'	1.49'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 12:05 Note: in-water work started at 10:05 today.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? Yes, very slight.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Riprap was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site.
Yellow containment boom was placed all around the placement area and oil absorbent boom was
onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

Sheen was very slight along the shore; no corrective action was taken.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner

Date: 8/30/2005

	High Tide	Low Tide
Time	17:19	12:18
Height	3.32'	1.37'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X

If yes was circled, then a reading is required. Result of reading: N/A

Time: 10:15 Note: in-water work started at 8:15 and ended at 15:00 today.

Does the turbidity appear greater than background downstream of construction? Yes No X

If yes was circled, then a reading is required. Result of reading: N/A

Time: 13:20

Does the turbidity appear greater than background downstream of construction? Yes No

If yes was circled, then a reading is required. Result of reading:

Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.

Observable sheen outside construction area? No.

If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Riprap was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site.

Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X

If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X

If yes, did you note the time, direction and location? Yes No

Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 8/31/2005

	High Tide	Low Tide
Time	17:59	13:00
Height	3.48'	1.32'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 12:30 Note: in-water work started at 10:30 and ended at 16:00 today.

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Sand and 6-inch minus rock were placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site. Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 09/01/05

	High Tide	Low Tide
Time	18:31	13:37
Height	3.59'	1.31'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 11:10 Note: in-water work started at 9:10 and ended at 15:15 today.

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
6-inch minus rock was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site. Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner

Date: 09/06/05

	High Tide	Low Tide
Time	8:00	15:32
Height	3.59'	1.55'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No

If yes was circled, then a reading is required. Result of reading:

Time: N/A Note: in-water work started at 8:30 and ended at 10:30 today.

Does the turbidity appear greater than background downstream of construction? Yes No

If yes was circled, then a reading is required. Result of reading:

Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No

If yes was circled, then a reading is required. Result of reading:

Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.

Observable sheen outside construction area? No.

If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

6-inch minus rock was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site. Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X

If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X

If yes, did you note the time, direction and location? Yes No

Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 09/07/05

	High Tide	Low Tide
Time	20:06	14:42
Height	4.03'	0.76'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 12:00 Note: in-water work started at 10:00 and ended at 15:30 today.

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Riprap was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site. Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 09/08/05

	High Tide	Low Tide
Time	21:00	15:00
Height	3.88'	1.03'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 9:45 Note: in-water work started at 7:45 and ended at 14:15 today.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 13:20

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Riprap was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site. Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 09/09/05

	High Tide	Low Tide
Time	8:00	15:00
Height	2.88'	1.33'

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 11:30 Note: in-water work started at 9:30 and ended at 14:30 today.

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
6-inch minus rock was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site. Yellow containment boom was placed all around the placement area and oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 09/13/05

	High Tide	Low Tide
Time		
Height		

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 11:00 Note: in-water work started at 9:00 and ended at 14:45 today.

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
6-inch minus rock was placed approximately 200 feet SE of the railroad bridge at the McCormick and Baxter Site, as well as in two small areas at the upstream and downstream end of the site. Yellow containment boom and oil absorbent boom were onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No
Photolog reference numbers:

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 10/20/05

	High Tide	Low Tide
Time		
Height		

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 11:00 Note: in-water work started at 9:00 and ended at 17:00 today.
Note: Turbidity meter would not give turbidity readings, and after discussing the issue with the equipment rental company technician, it was concluded that the meter was broken and a new one is being shipped overnight to arrive in time for turbidity readings tomorrow. Visual observations were made at least every two hours.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading:
Time: 13:00

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading:
Time: 15:00

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Sand and organoclay mats were placed underneath the railroad bridge at the McCormick and Baxter Site. Oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes X No
If yes, did you note the time, direction and location? Yes X No

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Vanessa Rayner
Date: 10/21/05

	High Tide	Low Tide
Time		
Height		

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 10:15 Note: in-water work started at 8:15 and ended at 16:15 today.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 14:15

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Organoclay mats, sand and 6" minus rock were placed underneath the railroad bridge at the McCormick and Baxter Site. Oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes X No
If yes, did you note the time, direction and location? Yes X No

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

Daily Environmental Monitoring Form

Monitor's Name: Jim Petersen
Date: 10/24/05

	High Tide	Low Tide
Time	8:00 AM	12:00 PM
Height	1.3' CRD	3.2' CRD

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 9:30 Note: in-water work started at 7:30 and ended at 15:15 today.

Does the turbidity appear greater than background downstream of construction? Yes No X
If yes was circled, then a reading is required. Result of reading: N/A
Time: 14:30

Does the turbidity appear greater than background downstream of construction? Yes No
If yes was circled, then a reading is required. Result of reading:
Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? Yes. Small sheen, see below.
Observable sheen outside construction area? No.
If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:
Organoclay mats, sand and 6" minus rock were placed underneath the railroad bridge at the McCormick and Baxter Site. Oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X
If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X
If yes, did you note the time, direction and location? Yes No X

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

Small (approx. 24-inch diameter) sheen was observed at 09:30. It appeared to have come up from the location of the barge spud. The sheen dissipated within 3 to 5 minutes; no additional sheen was observed. Construction contractor had containment boom ready to deploy, but no additional sheen was seen.

Corrective Actions

None. Construction contractor had containment boom ready to deploy, but no additional sheen was seen.

Daily Environmental Monitoring Form

Monitor's Name: Jim Petersen

Date: 10/25/05

	High Tide	Low Tide
Time	9:00 AM	1:00 PM
Height	1.7' CRD	3.5' CRD

Water Quality (Relative Turbidity) Observations of Willamette River

Observations to be taken four hour intervals with two hour lag time from turbidity readings.

Does the turbidity appear greater than background downstream of construction? Yes No X

If yes was circled, then a reading is required. Result of reading: N/A

Time: 9:15 Note: in-water work started at 7:45 and ended at 11:00 today.

Does the turbidity appear greater than background downstream of construction? Yes No X

If yes was circled, then a reading is required. Result of reading: N/A

Time: 11:00

Does the turbidity appear greater than background downstream of construction? Yes No

If yes was circled, then a reading is required. Result of reading: N/A

Time: N/A

Water Quality (Observable Sheen)

Observable sheen in construction area? No.

Observable sheen outside construction area? No.

If the answer was yes to any of the above, complete Observations and Corrective Actions, below.

In-water Controls

Note the location/locations of In-water work activities, and describe the turbidity/chemical control measures being utilized:

Rip rap rock was placed underneath the railroad bridge at the McCormick&Baxter site as armoring for organoclay mats. Oil absorbent boom was onboard in case of sheen or NAPL release.

Habitat

Were shoreline features moved or displaced since last monitoring event? Yes No X

If yes, document with pictures and describe in Observations and Corrective Actions, below.

Photo Documentation

Were photographs taken during monitoring event? Yes No X

If yes, did you note the time, direction and location? Yes No X

Perimeter Walk Observations (Include Sick, Dead, or Injured Fish or Animal Species and Identify)

None.

Observations

None.

Corrective Actions

None.

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Daily Turbidity Reports

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DAILY TURBIDITY READINGS FORM

Date: 8/10/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.0Y21.25.03

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:35
Result: 1.0/10 NTU
Standard of Procedure: 1.0/10 NTU

POST-MONITORING CALIBRATION

Time: 14:41
Result: 1.0/10 NTU
Standard of Procedure: 1.1/10 NTU

MONITORING POINT

Name: Off back of barge ~100' from sand placement to the W
Time: 9:20
Depth: 23'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	21'	10'	2'
Turbidity:	8.2	9.3	5.5

MONITORING POINT

Name: Downriver Compliance
Time: 11:00
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	18'	10'	2'
Turbidity:	8.1	6.4	5.4

MONITORING POINT

Name: Upriver Background
Time: 11:15
Depth: 21'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	20'	11'	2'
Turbidity:	4.3	5.0	4.4

MONITORING POINT

Name: Off back of tugboat ~100' W of sand placement
Time: 11:30
Depth: 39'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	38'	20'	2'
Turbidity:	5.5	4.2	3.4

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Raymer

Title: Oversight Engineer

Signature: Vanessa Raymer

Date: 8/10/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 8/12/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.:

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:15
Result: 1.0/10 NTU
Standard of Procedure: 1.0/10 NTU

POST-MONITORING CALIBRATION

Time: 15:00
Result: 0.82/11 NTU
Standard of Procedure: 1.0/10 NTU

MONITORING POINT

Name: Upriver Background
Time: 12:35
Depth: 22'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	20'	11'	2'
Turbidity:	4.3	4.5	5.9

MONITORING POINT

Name: Downriver Compliance
Time: 13:10
Depth: 20'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	18'	10'	2'
Turbidity:	6.4	5.3	4.9

MONITORING POINT

Name: Off back of barge approx. 100' SE of sand placement
Time: 13:25
Depth: 43'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	40'	21'	2'
Turbidity:	9.7	4.2	3.7

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature: Vanessa Rayner

Date: 8/12/05

Note: In-water work usually goes from 8am to 2pm, but varies by day. No in-water work was performed yesterday, 8/11/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 8/15/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.:

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:15
Result: 1.0/10 NTU
Standard of Procedure: 1.0/10 NTU

POST-MONITORING CALIBRATION

Time: 15:00
Result: 0.80/10 NTU
Standard of Procedure: 10/10 NTU

MONITORING POINT

Name: Downriver Background
Time: 12:35
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	4.7	3.7	3.0

MONITORING POINT

Name: Upriver Background
Time: 12:45
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	3.5	3.7	3.3

MONITORING POINT

Name: Danger Buoy Just Upstream of Railroad Bridge - approx. 100' Upstream of Sand Placement
Time: 13:00
Depth: 35'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	34'	18'	2'
Turbidity:	7.4	4.8	4.0

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature: Vanessa Rayner

Date: 8/15/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 8/17/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.:

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 9:30
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 16:00
Result: 0.85/9.7
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 14:15
Depth: 21'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	19'	10'	2'
Turbidity:	6.8	5.6	5.0

MONITORING POINT

Name: Upriver Background
Time: 21'
Depth: 14:30

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	19'	10'	2'
Turbidity:	4.6	5.4	4.4

MONITORING POINT

Name: Off Back of Tugboat 100' S of Sand Placement
Time: 14:45
Depth: 41'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	39'	20'	2'
Turbidity:	9.6	3.5	3.5

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature: Vanessa Rayner

Date: 8/17/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 8/18/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.:

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:15
Result: 1.0
Standard of Procedure: 1.0

POST-MONITORING CALIBRATION

Time: 17:00
Result: 0.95
Standard of Procedure: 1.0

MONITORING POINT

Name: Downriver Compliance
Time: 11:30
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	5.5	4.8	3.9

MONITORING POINT

Name: Upriver Background
Time: 11:45
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	4.2	4.1	3.1

MONITORING POINT

Name: Off Back of Sand Barge Approx.
Time: 11:55
Depth: 45'
100' S of Placement

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	44'	23'	2'
Turbidity:	5.5	4.8	3.6

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature: Vanessa Rayner

Date: 8/18/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 8/22/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.:

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:20
Result: 1.0
Standard of Procedure: 1.0

POST-MONITORING CALIBRATION

Time: 15:30
Result: 0.98
Standard of Procedure: 1.0

MONITORING POINT

Name: Downriver Compliance
Time: 12:10
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	11.2	7.9	6.2

MONITORING POINT

Name: Upriver Background
Time: 12:20
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	6.7	4.8	3.9

MONITORING POINT

Name: From Dive Boat ~ 100 ft downstream of sand placement and 100 ft upstream of railroad bridge
Time: 12:35
Depth: 28'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	26'	14'	2'
Turbidity:	7.8	5.2	4.2

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Signature: Vanessa Rayner

Title: Oversight Engineer

Date: 8/22/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 8/23/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.:

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:40
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 15:30
Result: 1.1/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 12:35
Depth: 20'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	18'	10'	2'
Turbidity:	6.0	5.6	5.4

MONITORING POINT

Name: Upriver Background
Time: 12:52
Depth: 20'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	18'	10'	2'
Turbidity:	5.2	4.8	4.3

MONITORING POINT

Name: Off Back of Crane Barge Approx
Time: 13:20 100 ft downstream
Depth: 43' of sand placement

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	41'	21'	1'
Turbidity:	5.8	5.5	4.2

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature: Vanessa Rayner

Date: 8/23/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 08/27/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:30
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 15:15
Result: 1.1/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 12:20
Depth: 18'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	3.6	3.2	3.5

MONITORING POINT

Name: Upriver Background
Time: 12:37
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	3.8	3.6	3.0

MONITORING POINT

Name: Off back of tugboat approx. 100 feet downstream from rock placement
Time: 12:45
Depth: 35'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	33'	17'	2'
Turbidity:	7.2	5.0	4.0

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 08/27/05

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DAILY TURBIDITY READINGS FORM

Date: 08/29/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 9:00
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 16:00
Result: 0.97/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 14:00
Depth: 18'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	5.2	4.6	4.0

MONITORING POINT

Name: Upriver Background
Time: 14:12
Depth: 20'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	18'	10'	2'
Turbidity:	4.2	4.3	4.1

MONITORING POINT

Name: Off back of barge approx. 100 feet downstream from riprap placement
Time: 14:21
Depth: 35'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	33'	17'	2'
Turbidity:	4.8	4.8	4.7

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 08/29/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 08/30/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:30
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 16:00
Result: 1.3/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 11:20
Depth: 18'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	5.6	5.0	4.6

MONITORING POINT

Name: Upriver Background
Time: 11:29
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	15'	8'	2'
Turbidity:	6.6	5.7	4.2

MONITORING POINT

Name: Off back of barge approx. 100 feet downstream from material placement
Time: 11:42
Depth: 31'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	29'	16'	2'
Turbidity:	6.0	5.8	4.3

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 08/30/05

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DAILY TURBIDITY READINGS FORM

Date: 08/31/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 10:30
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 17:00
Result: 0.95/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 14:30
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	15'	8'	2'
Turbidity:	5.8	5.1	5.6

MONITORING POINT

Name: Upriver Background
Time: 14:39
Depth: 21'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	19'	10'	2'
Turbidity:	4.7	5.0	4.5

MONITORING POINT

Name: Off back of barge approx. 100 feet downstream from material placement
Time: 11:42
Depth: 31'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	36'	17'	2'
Turbidity:	5.1	5.4	5.7

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 08/31/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 09/01/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 9:30
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 16:15
Result: 1.0/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 13:10
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	15'	8'	2'
Turbidity:	7.4	6.0	5.9

MONITORING POINT

Name: Upriver Background
Time: 13:22
Depth: 18'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	6.4	5.2	4.0

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from rock placement
Time: 13:34
Depth: 20'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	18'	10'	2'
Turbidity:	5.3	5.9	7.7

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 09/01/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 09/06/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:30
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 13:00
Result: 0.98/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Off back of barge approx. 100 feet downstream from rock placement
Time: 10:30
Depth: 43'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	40'	19'	2'
Turbidity:	5.4	4.7	4.4

MONITORING POINT

Name: Upriver Background
Time: 10:41
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	5.5	5.3	4.0

MONITORING POINT

Name: Downriver Compliance
Time: 10:53
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	15'	8'	2'
Turbidity:	5.1	4.9	4.7

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 09/06/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 09/07/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 10:00
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 16:00
Result: 0.95/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 14:00
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	15'	8'	2'
Turbidity:	5.6	6.8	5.5

MONITORING POINT

Name: Upriver Background
Time: 14:14
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	4.1	4.5	4.6

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from rock placement
Time: 14:26
Depth: 28'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	26'	14'	2'
Turbidity:	7.5	6.3	7.1

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 09/07/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 09/08/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:08
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 15:30
Result: 1.1/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Upriver Background
Time: 11:22
Depth: 21'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	19'	10'	2'
Turbidity:	6.0	5.7	4.8

MONITORING POINT

Name: Downriver Compliance
Time: 11:34
Depth: 18'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	5.9	6.1	4.5

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from rock placement
Time: 11:50
Depth: 27'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	25'	13'	2'
Turbidity:	5.5	4.9	4.6

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 09/08/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 09/09/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 10:00
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 15:15
Result: 0.85/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Upriver Background
Time: 13:45
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	9'	2'
Turbidity:	5.8	4.2	3.9

MONITORING POINT

Name: Downriver Compliance
Time: 13:56
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	15'	8'	2'
Turbidity:	4.8	4.6	4.0

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from rock placement
Time: 14:05
Depth: 33'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	31'	17'	2'
Turbidity:	5.6	4.3	3.9

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 09/09/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 09/13/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 9:25
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 14:20
Result: 1.2/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 13:12
Depth: 17'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	15'	8'	2'
Turbidity:	5.7	4.9	5.3

MONITORING POINT

Name: Upriver Background
Time: 13:23
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	5.5	6.0	3.5

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from rock placement
Time: 13:36
Depth: 15'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	13'	7'	2'
Turbidity:	3.8	3.6	4.0

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 09/13/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 10/21/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 11:45
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 16:10
Result: 0.95/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 12:25
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	9'	2'
Turbidity:	4.8	5.1	4.6

MONITORING POINT

Name: Upriver Background
Time: 12:05
Depth: 21'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	19'	10'	2'
Turbidity:	3.6	4.2	3.5

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from sand placement
Time: 12:40
Depth: 26'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	24'	12'	2'
Turbidity:	4.4	3.7	3.6

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Vanessa Rayner

Title: Oversight Engineer

Signature:

Date: 10/21/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 10/24/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 10:25
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 15:00
Result: 1.0/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 11:45
Depth: 18'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	4.0	3.9	4.0

MONITORING POINT

Name: Upriver Background
Time: 11:30
Depth: 19'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	17'	10'	2'
Turbidity:	4.5	4.7	4.2

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from rock placement
Time: 12:00
Depth: 34'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	32'	17'	2'
Turbidity:	4.4	4.2	3.9

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Jim Petersen

Title: Oversight Engineer

Signature:

Date: 10/24/05

ecology and environment, inc.

DAILY TURBIDITY READINGS FORM

Date: 10/25/05

Project Title: McCormick & Baxter Sediment Cap Completion

Client: ODEQ

E & E Project No.: 002688.OY21.25.02

Turbidity Background Value:

PRE-MONITORING CALIBRATION

Time: 8:45
Result: 1.0/10
Standard of Procedure: 1.0/10

POST-MONITORING CALIBRATION

Time: 10:10
Result: 1.0/10
Standard of Procedure: 1.0/10

MONITORING POINT

Name: Downriver Compliance
Time: 9:35
Depth: 17.5

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	4.2	4.1	3.7

MONITORING POINT

Name: Upriver Background
Time: 9:15
Depth: 18'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	16'	9'	2'
Turbidity:	4.0	3.6	3.5

MONITORING POINT

Name: Off side of barge approx. 100 feet downstream from rock placement
Time: 12:00
Depth: 36'

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:	34'	18'	2'
Turbidity:	4.1	4.0	3.7

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

MONITORING POINT

Name:
Time:
Depth:

	Latitude	Longitude
Location:		

	Lower	Middle	Upper
Depth:			
Turbidity:			

Prepared By: Jim Petersen

Title: Oversight Engineer

Signature:

Date: 10/25/05

K Weekly Meeting Minutes

Note: This page intentionally left blank.

WEEKLY MEETING # 2
McCormick and Baxter Sediment Cap Completion
August 17, 2005

Attendees:

Name	Organization
Andrew Murphy	Ecology and Environment (E&E)
Vanessa Rayner	Ecology and Environment (E&E)
Kevin Parrett	Department of Environmental Quality (DEQ)
Steve Campbell	Department of Environmental Quality (DEQ)
Mike Johns	Advanced American Diving (AAD)
Jake Duyck	Advanced American Diving (AAD)

ITEM DESCRIPTION

SCHEDULE

AAD states that the baseline schedule still applies. They are on schedule and will only submit a revised schedule if changes are necessary.

SUBMITTALS

No discussion.

CONTRACT CHANGES

Dive Survey:

AAD submitted a cost proposal for Dive Survey and associated tasks. E&E is evaluating cost proposal in order to comply with CERCLA regulations. If agreement to cost, schedule, and impacts to the project if unacceptable depth of sand is encountered are made today, than dive survey can start as soon as tomorrow. An agreement was made to plan for the Dive Survey to happen on Friday.

AAD is to call David Evans and Associates for hourly estimate deliverable as-built with locations and findings.

K.P. confirmed with AAD that the dive survey would be video taped.

NEW BUSINESS

1. E&E are to issue a directive that officially substitutes the revised Specification Section 02300-Armoring.
2. AAD is coordinating an inspection of the armoring material that has not been inspected by E&E geotechnical engineer.
3. AM is to contact the geotechnical engineer about the remaining inspections.

WEEKLY MEETING # 3
McCormick and Baxter Sediment Cap Completion
August 24, 2005

Attendees:

Name	Organization
Andrew Murphy	Ecology and Environment (E&E)
John Montgomery	Ecology and Environment (E&E)
Kevin Parrett	Department of Environmental Quality (DEQ)
Steve Campbell	Department of Environmental Quality (DEQ)
Mike Johns	Advanced American Diving (AAD)
Jake Duyck	Advanced American Diving (AAD)

ITEM DESCRIPTION

SCHEDULE
AAD states that there are no significant changes to the baseline schedule.
SUBMITTALS
1. Barge receipts
2. Daily capping reports are being conveyed to E&E and DEQ through Vanessa R.

CONTRACT CHANGES
Change Order #1 regarding the Dive Survey was issued and signed.

OLD BUSINESS
1. E&E are to issue a directive that officially substitutes the revised Specification Section 02300-Armoring.
Task was completed.
2. AAD is coordinating an inspection of the armoring material that has not been inspected by E&E geotechnical engineer.
Task was completed.
3. AM is to contact the geotechnical engineer about the remaining inspections.
Task was completed
NEW BUSINESS
1. E&E are to issue a directive that requests a cost proposal for an extra 400 tons of 6”-minus and the crane barge costs for one day.

2. DEQ presented the preliminary result of dive survey. KP states that DEQ needs real-time As-builts from DEA and then a useable drawing produced by E&E and DEA showing the results of the Dive Survey. He also reported that the loops in Willamette Cove are mostly covered with sand and does not appear that very many loops are exposed to be cut during the Dive Survey as requested in the Dive Survey Change Order.

AAD states that the amount of money and time included in the cost proposal should cover DEA office work needed.

3. SC states that he has not received certified payroll from AAD, and that it is a contract requirement. They are to be submitted to E&E. He also asked when E&E and DEQ would receive their first invoice. AAD replied to the questions were that they could deliver certified payrolls as they are continually produced and that the invoice could be delivered with a cut-off date to be determined by AAD and DEQ.

WEEKLY MEETING # 4
McCormick and Baxter Sediment Cap Completion
September, 7, 2005

Attendees:

Name	Organization
Andrew Murphy	Ecology and Environment (E&E)
John Montgomery	Ecology and Environment (E&E)
Kevin Parrett	Department of Environmental Quality (DEQ)
Steve Campbell	Department of Environmental Quality (DEQ)
Mike Johns	Advanced American Diving (AAD)
Jake Duyck	Advanced American Diving (AAD)

ITEM DESCRIPTION

SCHEDULE
AAD states that there are no significant changes to the baseline schedule.

SUBMITTALS
Refer to the attached spreadsheet.

CONTRACT CHANGES
Change Order #2 was signed.

OLD BUSINESS
1. E&E are to issue a directive that requests a cost proposal for an extra 400 tons of 6”-minus and the crane barge costs for one day (completed)

2. DEQ presented the preliminary result of dive survey. KP states that DEQ needs real-time As-builts from DEA and then a useable drawing produced by E&E and DEA showing the results of the Dive Survey. He also reported that the loops in Willamette Cove are mostly covered with sand and does not appear that very many loops are exposed to be cut during the Dive Survey as requested in the Dive Survey Change Order (pending).

AAD states that the amount of money and time included in the cost proposal should cover DEA office work needed (pending).

3. SC states that he has not received certified payroll from AAD, and that it is a contract requirement. They are to be submitted to E&E. He also asked when E&E and DEQ would receive their first invoice. AAD replied to the questions were that they could deliver certified payrolls as they are continually produced and that the invoice could be delivered with a cut-off date to be determined by AAD and DEQ (pending).

NEW BUSINESS
1. E&E and AAC to draft CO #3 to include the following:
   - To provide and place an additional 290 tons,
   - To provide and place an additional 600 tons, and
   - To provide and place an additional 200 tons of 6”-minus.

   The cost proposal shall assume that the crane barge will be needed for two days.

2. AAC to produce a budget analysis of CO #2.
3. AAC to provide the following services under CO #2 provided the funds are available:

- The divers are to trim geotextile, and
- When broken ACB blocks are observed or indicated by buoys (placed E&E), AAC is to remove the broken blocks and replace them with whole or cleanly broken half blocks.

4. AAC, DEQ, and E&E are to produce a scope of work for DEA dive survey support regarding the production of as-builts.

5. E&E are to produce a directive authorizing DEA to continue dive survey support under CO#2 in excess of the cost proposal amount.

WEEKLY MEETING # 4
McCormick and Baxter Sediment Cap Completion
Meeting Date: September, 7, 2005

Attendees:

Name	Organization
Andrew Murphy	Ecology and Environment (E&E)
John Montgomery	Ecology and Environment (E&E)
Kevin Parrett	Department of Environmental Quality (DEQ)
Steve Campbell	Department of Environmental Quality (DEQ)
Mike Johns	Advanced American Diving (AAD)
Jake Duyck	Advanced American Diving (AAD)

ITEM DESCRIPTION

SCHEDULE
AAD is expecting to complete in water work on Friday.

SUBMITTALS
Refer to the attached spreadsheet.

CONTRACT CHANGES

OLD BUSINESS

1. DEQ presented the preliminary result of dive survey. KP states that DEQ needs real-time As-builts from DEA and then a useable drawing produced by E&E and DEA showing the results of the Dive Survey. He also reported that the loops in Willamette Cove are mostly covered with sand and does not appear that very many loops are exposed to be cut during the Dive Survey as requested in the Dive Survey Change Order (Completed).

AAD states that the amount of money and time included in the cost proposal should cover DEA office work needed (Completed).

2. SC states that he has not received certified payroll from AAD, and that it is a contract requirement. They are to be submitted to E&E. He also asked when E&E and DEQ would receive their first invoice. AAD replied to the questions were that they could deliver certified payrolls as they are continually produced and that the invoice could be delivered with a cut-off date to be determined by AAD and DEQ (Completed, however, they were delivered to DEQ and not E&E as contracted).

3. E&E and AAC to draft CO #3 to include the following:
- To provide and place an additional 600 tons Rip-Rap, and
- To provide and place an additional 200 tons of 6”-minus.

The cost proposal shall assume that the crane barge will be needed for two days (Completed).

4. AAC to produce a budget analysis of CO #2 (Completed).

5. AAC to provide the following services under CO #2 provided the funds are available:

- The divers are to trim geotextile, and
- When broken ACB blocks are observed or indicated by buoys (placed E&E), AAC is to remove the broken blocks and replace them with whole or cleanly broken half blocks **(Pending).**

6. AAC, DEQ, and E&E are to produce a scope of work for DEA dive survey support regarding the production of as-builts **(Pending).**

7. E&E are to produce a directive authorizing DEA to continue dive survey support under CO#2 in excess of the cost proposal amount (Completed).

NEW BUSINESS

1. Additional work under bridge which will include placement of 1-foot of sand, organoclay mats, another 1-foot of sand, 8" of 6-inch minus rock, and then Rip-rap.
    - E&E to produce a directive giving AAC the authorization to purchase 7 rolls of organoclay mats with assistance from DEQ.
    - AAC to contact Heidi Blischke at DEQ (heidi@deq.state.or.us.) for details regarding the specification for the materials to purchase from CETCO.
    - DEQ, E&E, and AAC to coordinate and produce a scope of work to include pile removal, debris, material placement, and as-builts.
2. Modify contract completion date to end October 30th to allow the extra work to be performed.

L Photographic Documentation

Note: This page intentionally left blank.

Photo 1 AAC placing sand with clamshell bucket.

Direction: *East*

Photo 2 Kevin Parrett of DEQ holding Core C4 during sand layer thickness verification.

Direction: *East*

Photo 3 AAD diver gearing up to investigate upstream end of dive survey Item H2.

Direction: *Northeast*

Photo 4 AAD diver with probe in hand to investigate Item H2.

Direction: *Down*

Photo 5 AAC grabbing gravel filter rock with clamshell bucket; view of gravel filter and 6-inch minus rock on barge.

Direction: *South*

Photo 6 Gravel filter rock placed along water's edge.

Direction: *East*

Photo 7 AAC placing riprap in skip box with loader.

Direction: *East*

Photo 8 AAC placing riprap with skip box.

Direction: *Northeast*

Photo 9 AAC placing 6-inch minus rock with clamshell bucket in light-armor area adjacent to the sediment cap completion area on the upstream side.
Direction: *Northeast*

Photo 10 Boulder pile on rock mound spread out by AAC.

Direction: *East*

Photo 11 AAC placing riprap with skip box in area adjacent to the sediment cap completion area on the upstream side.

Direction: *Northeast*

Photo 12 AAC loading skip box with riprap to place in area adjacent to the sediment cap completion area on the downstream side.

Direction: *Northwest*

Photo 13 AAC sounding with a probe marked at 1-foot increments to check riprap placement in area adjacent to the sediment cap completion area on the downstream side.
Direction: *Northeast*

Photo 14 AAC placing riprap with skip box in area adjacent to the sediment cap completion area on the downstream side.

Direction: *Northeast*

Photo 15 AAD cutting geotextile fabric and placing in skiff.

Direction: *Southwest*

Photo 16 AAD placing ACB blocks in large gap between mats that was discovered in Willamette Cove during the dive survey.

Direction: *South*

Photo 17 AAD collecting extra ACB blocks from shore and placing them in the skiff to take to Willamette Cove for placement in gaps.
Direction: *North*

Photo 18 AAD cutting PVC pipe markers from the embayment at very low water.

Direction: *East*

Photo 19 AAD collecting previously cut geotextile fabric pieces and placing them in a trash bag.

Direction: *West*

Photo 20 Small ACB gap in Willamette Cove that AAD neatly placed whole and half ACB blocks in to fill.

Direction: *Down*

Photo 21 Close-up view of clamshell bucket and skip box on barge.

Direction: *South*

Photo 22 AAC placing 6-inch minus rock over 8' x 20' area near dive survey Item H2.

Direction: *East*

Photo 23 AAC placing 6-inch minus rock over 20' x 60' area along "ACB Area 2" - view from skiff.

Direction: *East*

Photo 24 AAC lifting CETCO organoclay mat using crane barge and spreader bar.

Direction: *South*

Photo 25 AAD placing CETCO organoclay mats with skiff after mats are loaded in with crane barge and spreader bar.

Direction: *South*

Photo 27 AAC cutting 100'x15' CETCO organoclay mat into 50'x15' pieces.

Direction: *South*

Photo 26 AAC fully extending 100'x15' CETCO organoclay mat to be cut in half using crane barge and spreader bar.
Direction: *South*

Photo 28 AAD placing 50'x15' CETCO organoclay mats with skiff after mats are loaded in with crane barge and spreader bar.

Direction: *South*

Photo 30 AAD placing 25'x15' CETCO organoclay mats with skiff after mats are loaded in with crane barge and spreader bar.

Direction: *South*

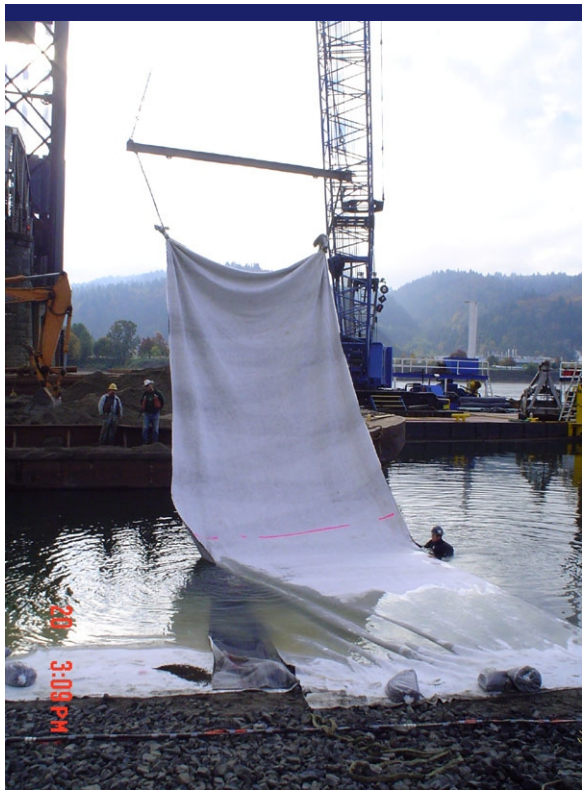

Photo 29 AAD placing 50'x15' CETCO organoclay mats using crane barge and spreader bar.

Direction: *South*

Photo 31 All CETCO organoclay mats placed at approximately + 3 CRD.

Direction: *West*

Photo 32 AAD inspecting CETCO organoclay mat placement and overlap seams.

Direction: *South*

Photo 33 AAC placing sand over CETCO organoclay mats with an excavator.

Direction: *North*

Photo 34 AAC placing sand over CETCO organoclay mats with an excavator.

Direction: *East*