

ATTACHMENT E
McCORMICK AND BAXTER SITE INFORMATION

This attachment summarizes innovative technologies that have been used for site characterization, and/or that show particular promise for dynamic site investigations. Specific resources for technologies are provided in the form of tables. Information about procurement options are provided, along with examples of how unit costs can be built using related technologies and services.

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**McCORMICK BAXTER SITE
SONIC DRILLING SCOPE OF WORK**

CESPK-ED-E 8

March 2000

SCOPE OF WORK

SUBJECT: SUBSURFACE EXPLORATIONS, McCORMICK AND BAXTER SUPERFUND SITE, STOCKTON, CA

CONTRACTOR:

CONTRACT NUMBER:

POC:

Telephone:

Fax:

1.0 GENERAL REQUIREMENTS

This scope of work (SOW) describes the subsurface explorations using the sonic drilling technology to be performed at the McCormick and Baxter Superfund Site, in Stockton, California on or about 19 June 2000. All work described in this SOW is contingent upon available funding. This SOW consists of drilling a minimum of two (2) boreholes (Referred to as Primary Borings) using roto-sonic technology to an approximate depth of 250 feet, collecting soil samples for chemical analysis and lithological characterization. Depending on funding availability other options will be completed though not necessarily in the order presented in the SOW. The SOW also consists of drilling a minimum of two additional boreholes (referred to as Option 1), depending on new site data, borings using roto-sonic technology to an approximate depth of 250 feet, collecting soil samples for chemical analysis and lithological characterization. This SOW also consists of drilling up to five (5) borings using roto-sonic technology to an approximate depth of 250 feet and collecting soil samples for chemical analysis and lithologic characterization. These borings (referred to as Option 2) will be continuously cored to the maximum depth, logged, and sampled at various intervals from a depth specified in the field (approximately 100 ft below ground surface (bgs) or as designated by the field geologist) to an approximate depth of 250 feet bgs. The individual options may not be in order of operation. The 'Primary' and 'Option 1' borings will be continuously cored from ground surface to the maximum depth (approximately 250). This SOW includes an option to convert up to four of the (option 1 borings) to monitoring wells. The wells may be installed to the maximum depth of 250 feet bgs as specified by the field geologist. A third option may consist of up to 5 borings, drilled from a barge in Old Mormon Slough (referred to as Option 3) will be continuously cored to maximum depth, logged, and sampled at various intervals from the mud line (approximately 12 feet below the water line) to an approximate depth of 170 linear feet below the mud line. Another option (referred to as Option 4) may consist of drilling up to five (5) borings continuously cored to a maximum depth, logged and sampled at various intervals from a depth specified in the field (approximately 100 ft bgs) to an approximate depth of approximately 250-ft bgs.

2.0 PROJECT BACKGROUND AND LOCATION

The McCormick and Baxter (M&B) wood preserving company operated on a 29-acre site at 1295 W. Washington Street in Stockton, California from 1942 until 1990. M&B chemically treated wood products in pressure cylinders with various preservation solutions containing creosote, pentachlorophenol (PCP), arsenic, copper, chromium, and zinc. Solvents or carriers for these preservatives reportedly included

petroleum based fuels such as fuel oil kerosene and diesel, butane, and ether. The chemicals of concern (COC) identified for the M&B site are PCP, carcinogenic polynuclear aromatic hydrocarbon (CPAH), arsenic, dioxins/furans and naphthalene. Dioxins/furans are believed to have originated as manufacturing impurities contained in the PCP solution.

The M&B site is located in an industrial area near the junction of the I-5 interchange (see figure 1). The northern boundary of the site borders Old Mormon Slough, which empties into the Port of Stockton turning basin on the San Joaquin River. The site terrain is relatively flat and the only remaining aboveground structures at the site are an office building, two storage sheds, a large asphalt pad, older unused buildings, a wooden tower, a number of building foundations and a storm water collection system lift station. The former processing areas and tank farm are paved, and the rest of the site is unpaved with limited vegetative cover. A layer of gravel between one and three feet thick is found across most of the site. The subsurface strata most likely to be encountered are alluvial fan and fluvial deposits including silt, silty clay, clayey silt, silty sand, sand, and coarse-grained sands and gravels.

Drilling is likely to occur at off-site locations, directly north of the McCormick and Baxter Superfund site. Appropriate Rights-of-Entry shall be obtained by the lead agency (EPA) to perform work at off-site locations. The Contractor shall arrange for all site entry through Randy Olsen, U.S. Army Corps of Engineers (USACE) at (916) 557-5285.

3.0 PROTECTION OF SITE

The Contractor shall maintain existing survey monuments and existing structures, and protect them from damage from equipment and vehicular traffic. Any items damaged on-site by the Contractor shall be repaired to USACE specifications by the Contractor at the Contractor's expense. Any items damaged at an off-site location by the Contractor shall be repaired to the property owner's specification. Local and state water and air pollution requirements will be met and closely monitored.

All litter and debris will be cleaned up daily and placed in containers for proper disposal. After completion of work, the Contractor shall remove all debris, waste, trash, and unused materials or supplies and shall restore the site as nearly as possible to its original condition. The Contractor shall minimize dust during drilling activities, allowing time and personnel for dust control as needed.

4.0 DESCRIPTION OF WORK AND SERVICES

The Contractor shall furnish all services, materials, equipment, supplies, and personnel necessary to perform the services as required and described in this SOW. The Pricing Schedule summarizes work to be completed for this SOW and is located on page 10. *All work described in this SOW is contingent upon availability of funds.*

The work to be performed includes the following activities:

- **Primary Borings:** A minimum of two (2) borings drilled and continuously cored from the ground surface to an approximate depth of 250 ft bgs. The borings will be continuously logged and sampled from the surface to an approximate depth of 250 feet, as determined by USACE field personnel. Up to two, 4 inch diameter monitoring wells may be installed to a depth of up to 250 ft bgs.

- **OPTION 1:** Up to two (2) borings drilled and continuously cored from ground surface to an approximate depth of 250 ft bgs. The borings will be continuously logged and sampled from the surface to an approximate depth of 250 feet, as determined by USACE field personnel. Up to two, 4-inch diameter monitoring wells may be installed to a depth of up to 250 ft bgs.
- **OPTION 2:** Up to five (5) additional borings may be located north of the site and continuously cored from a specified depth (approximately 100-ft bgs) to approximately 250-ft bgs.
- **OPTION 3:** If contamination is not detected during initial activities north of the site, up to five (5) borings may be drilled from a barge in the Old Mormon Slough. The borings will be advanced to approximately 170 linear feet below the mud line.
- **OPTION 4:** Up to five (5) additional borings may be located on or within the site and continuously cored from a specified depth (approximately 100-ft bgs) approximately 250-ft bgs.

All borings will be drilled to characterize the extent of NAPL contamination and define the subsurface geology. All boring locations will be finalized in the field and will be drilled to approximately 250 feet bgs, as determined by USACE field personnel. The Contractor shall be prepared to drill to a maximum depth of 300 ft bgs if requested. Soil will be logged in all the boreholes, samples will be collected for analysis at designated intervals, and boring locations will be finalized by the USACE field geologist. Soil samples will be analyzed by onsite and offsite laboratories. The soil cores from the option 2 and the option 4 borings will be continuously logged and sampled by USACE field personnel from a specific depth of approximately 100 feet bgs to approximately 250 feet bgs. The drilling shall be in Level D PPE but the Contractor shall be prepared to upgrade to Level C PPE during drilling if required.

4.1 PERSONNEL

The Contractor shall provide personnel consisting of at least one experienced operator and two helpers. The operator shall have a minimum of five years experience operating the equipment provided, including the rotary-sonic drill rig. A second helper is required due to the potential for off-site drilling and implementing dust control measures. Supplies will be stored on-site and transported, as needed, to off-site drilling locations. Decontamination of all equipment shall occur on-site in a specified location and will require transport of materials to the off-site, as needed. Also, dust control measures (wet method) may be implemented, which will require Contractor personnel to spray on- and off-site work areas using the water truck. All individuals, including barge personnel, shall have the required EPA and OSHA training for hazardous waste operations in accordance with 29 CFR 1910.120 (40-Hour OSHA Certified), and the driller and at least one helper are required to have a Class B driver's license, with air-brake endorsement. The license and endorsement are needed to operate the water truck on public roadways (transport to/from site and on- and off-site locations). The Contractor shall have a current C-57 California State Water Well Drillers' License to perform the services specified in this scope of work. The Contractor shall also supply qualified personnel to operate/transport a barge to and from the site if Option 3 is authorized. The Contractors personnel shall be required to provide respirator fit tests. The contractor is also responsible for the security for all his equipment and/or materials left off-site during drilling activities, the security may include fencing, security personnel, etc. due to off set the possibility of theft and/or vandalism of his equipment. Any damage to the Contractors equipment shall be at the Contractors expense.

4.2 EQUIPMENT

The Contractor shall provide one roto-sonic drill rig, two water tanks, and a water truck; the Contractor shall also supply a barge and all other necessary equipment if Option 3 is authorized. The sonic rig shall be capable of drilling boreholes to depths of at least 300 feet using at least 6 inch outer diameter (OD) casing for the borings in Option 2,3, and 4; and 8-inch outer diameter (OD) casing for the borings in Option 1. The equipment must allow for the collection of soil samples by a California-Modified split spoon sampler and a 3.5-inch diameter core barrel in 5 foot and 10-foot sections. The drill rig shall be fully maintained, in good condition, and complete with all necessary accessories and supplemental equipment conforming to the manufacturer's specifications for the type and size required. Soil sample containers will be provided and collected by USACE personnel. The Contractor will supply all drums necessary to containerize drill cuttings and development water, as specified in section 5.1.9. The Contractor shall also supply two portable water tanks that together shall be able to contain 600 gallons of return water. Two tanks are needed due to the distance from the evaporation pad (on-site) from potential boring locations off-site. The Contractor shall also supply one water truck with at least a 2,000-gallon tank capacity to supply water for drilling and dust control. The water truck shall be fully maintained, in good condition, and complete with all necessary accessories and supplemental equipment conforming to the manufacturer's specifications for the type and size required. The driller and at least one helper shall have the appropriate, current license to operate the water truck on public roadways, as specified in Section 4.1. The drill rig shall be capable of drilling from a barge if option 3 is required. The barge shall be sufficient to allow for safe and efficient drilling/sample collection to occur if option 3 is authorized. The Contractor is responsible for maintaining his equipment. Any down time associated with the maintenance or repair of any piece of the equipment will be at the cost of the Contractor and not the Federal Government. The Contractor is also responsible for security for all off-site work to prevent/deter theft, destruction, and/or vandalism to the Contractor's property/equipment the Government will *not* be held liable or responsible for any theft, vandalism, or destruction to the Contractor's equipment.

4.3 SOIL SAMPLING

4.3.1 Primary Borings

Two (2) borings will be drilled using an eight - inch OD casing and a 3.5-inch diameter core barrel to collect soil samples. The core barrel will be advanced ahead of the casing for sample collection. Soil samples will be collected continuously from the ground surface to the total depth of the hole (determined in the field by the USACE geologist up to an approximate depth of 250-ft bgs). Soil samples will be vibrated out of the core barrel and into a plastic sleeve, knotted at both ends. Up to four of the borings may be completed as monitoring wells to a depth to be determined by the USACE field personnel, in accordance to the specifications outlined in sections 4.4 to 4.6.

The Contractor shall wear clean nitrile gloves during all drilling, decontamination and sampling activities. Gloves shall be changed prior to each soil sample collected and between each borehole.

Precautions shall be taken to fully contain water and soil cuttings produced during borehole drilling, sampling, abandonment, and decontamination of equipment. To minimize the potential for surface contamination, drill cuttings will be containerized immediately or contained using four-millimeter thick plastic sheets encircling the area adjacent to the drill flight. During drilling, borehole cuttings generated will be transferred from the plastic sheets to 55-gallon drums.

Uncompleted, open boreholes will be secured each time the boring is left unattended (predominantly overnight). The boreholes shall be covered to prevent access to the borehole. *At a minimum*, the hole shall be covered with heavy sheet metal (off-site)/two-inch plywood (on-site) and traffic cones. Perimeter safety tape shall encircle the borehole, as well. All completed boreholes shall be abandoned by the end of each day, in accordance with section 5.8 - Borehole Abandonment. The location of these borings will be north of the Old Mormon Slough and special security precautions and extra time must be allocated for drilling activities.

4.3.2 Option 1 Borings

Up to two (2) borings will be drilled using an eight -inch OD casing and a 3.5-inch diameter core barrel to collect soil samples. The core barrel will be advanced ahead of the casing for sample collection. Soil samples will be collected continuously from the ground surface to the total depth of the hole (determined in the field by the USACE geologist up to an approximate depth of 250-ft bgs). Soil samples will be vibrated out of the core barrel and into a plastic sleeve, knotted at both ends. Up to four of the borings may be completed as monitoring wells to a depth to be determined by the USACE field personnel, in accordance to the specifications outlined in sections 4.4 to 4.6.

The Contractor shall wear clean nitrile gloves during all drilling, decontamination and sampling activities. Gloves shall be changed prior to each soil sample collected and between each borehole.

Precautions shall be taken to fully contain water and soil cuttings produced during borehole drilling, sampling, abandonment, and decontamination of equipment. To minimize the potential for surface contamination, drill cuttings will be containerized immediately or contained using four-millimeter thick plastic sheets encircling the area adjacent to the drill flight. During drilling, borehole cuttings generated will be transferred from the plastic sheets to 55-gallon drums.

Uncompleted, open boreholes will be secured each time the boring is left unattended (predominantly overnight). The boreholes shall be covered to prevent access to the borehole. *At a minimum*, the hole shall be covered with heavy sheet metal (off-site)/two-inch plywood (on-site) and traffic cones. Perimeter safety tape shall encircle the borehole, as well. All completed boreholes shall be abandoned by the end of each day, in accordance with section 5.8 - Borehole Abandonment. The location of these borings will be north of the Old Mormon Slough and special security precautions and extra time must be allocated for drilling activities.

4.3.3 Monitoring Well Installation (optional)

A maximum of four monitoring wells may be installed in the contingency boreholes to a maximum depth of approximately 250 feet. The boreholes (Option 1), if exercised, will be drilled using an 8-inch casing to allow for potential installation of monitoring wells. The wells will be constructed with 4-inch diameter schedule 40 mild/carbon steel casing with a appropriate surface completion additions (either riser or flush mount as determined by USACE field personnel), locking well cap, and pre-packed, stainless steel, wire wrapped, well screen. Dielectric couplings (capable of withstanding steam injection) shall be installed between the stainless steel screen and the mild steel casing. The wells will have ten-foot screened intervals with a 0.02-inch screen slot size and will be prepacked with a sand filter pack consisting of clean Number 20 Monterey sand. The Number 20 Monterey sand (filter pack) will extend at least one foot below the screened interval and extend three feet above the screen interval. The sand will be placed below and above the prepacked screen using a tremie pipe. The top of the filter pack will be continuously sounded

during retraction of the temporary casing by the Contractor to ensure that the filter pack remains within the casing during removal. A bentonite clay seal will be placed above the filter pack with a maximum thickness of five feet and shall not be placed within NAPL (if present). The seal will be installed using 3/8-inch diameter bentonite pellets and the minimum hydration time for the bentonite seal will be one hour. Halliburton Class G – 40 percent silica flour cement grout will be mixed with a mechanical grout mixer (progressive cavity pump) and placed from the top of the clay seal to the ground surface using a tremie pipe. Centralizers will be placed at the top of the screen and every 40 feet above to the surface. The Contractor shall furnish and use stainless steel centralizers for centralizers that contact the ends of the screen and PVC centralizers for centralizers that contact the mild steel riser.

The wells may be screened at a depth other than the final depth of the boring. The difference between the final depth of the boring and the bottom of the well screen may be significant and may require the placement of a cement grout seal below the well screen using a tremie pipe. Sufficient time (i.e., 72 hours) will be required to allow the grout to set before constructing the well.

The Contractor shall be notified by the USACE at a minimum of 10 days before the installation of each well in order to have the well materials delivered on-site.

4.3.4 Option 2 Boreholes

A maximum of five (5) borings will be drilled using a six-inch OD casing to advance to a depth specified by the USACE field personnel (approximately 100 feet bgs). Once the casing has been advanced to the specified depth and excess soil has been removed, a 3.5-inch OD core barrel will be advanced in front of the casing to collect a continuous core sample. The core barrel will be advanced in either five -foot or 10-foot runs (determined by the USACE representative). Samples will be collected from the specified depth [approximately 100 feet bgs] to the total depth of the borehole (approximately 250 feet bgs)]. Some soil samples may potentially be requested from between the ground surface and the specified depth (approximately 100 feet bgs). Soil samples will be vibrated out of the core barrel and into a plastic sleeve, knotted at both ends. The Contractor shall take direction from the USACE field personnel before proceeding with each run. The most likely location of these borings will be north of the site and special security precautions and extra time must be allocated for drilling activities.

4.3.5 Option 3 Boreholes

A maximum of five (5) borings may be drilled from a barge. The barge shall be of sufficient size to allow for safe and efficient drilling and sample collection. The drilling shall be on the Old Mormon Slough off the Stockton Deep Water Channel on the San Joaquin River. The Old Mormon Slough is approximately 2500 feet long and 180 feet wide with most of slough approximately 10 feet deep. The slough has an approximately three-foot tidal influence. Using a 3.5-inch OD core barrel will be advanced from the mud line in front of the casing to collect a continuous core sample. The core barrel will be advanced in either 5-foot or 10-foot runs (determined by the USACE representative). Samples will be collected from the mud line to the total depth of the borehole approximately 170 linear feet below the mud line. Soil samples will be vibrated out of the core barrel and into a plastic sleeve, knotted at both ends. The Contractor shall take direction from the USACE field personnel before proceeding with each run.

4.3.6 Option 4 Boreholes

A maximum of five (5) borings may be drilled using a 6-inch OD casing to advance to a depth specified by the USACE field personnel (approximately 100 feet bgs). Once the casing has been advanced to the

specified depth and excess soil has been removed, a 3.5-inch OD core barrel will be advanced in front of the casing to collect a continuous core sample. The core barrel will be advanced in either five 5-foot or ten-foot runs (determined by the USACE representative). Samples will be collected from the specified depth [approximately 100 feet bgs] to the total depth of the borehole (approximately 250 feet bgs)]. Some soil samples may potentially be requested from between the ground surface and the specified depth (approximately 100 feet bgs). Soil samples will be vibrated out of the core barrel and into a plastic sleeve, knotted at both ends. The Contractor shall take direction from the USACE field personnel before proceeding with each run.

4.4 MONITORING WELL DEVELOPMENT (OPTION)

A maximum of four monitoring wells will be developed by surging, bailing, and pumping. The surge block will have a diameter slightly less (approximately 1/8-inch) than the inside diameter of the well casing. The well casing will be pumped prior to surging to insure that an adequate flow of water is entering the well. Surging will begin slowly across the entire length of the well screen. The pace of the surging motion will be gradually increased until the surge block has a vertical velocity of three to five feet per second. Well surging will be alternated with pumping approximately every 15 minutes during development to clean accumulations of sediment in the well and to allow the USACE representative to determine the progress of the well development. Development shall continue for a minimum of four hours or until the government inspector determines that the well is adequately developed for sampling purposes. At the end of development, the drillers will clean all sediment from the bottom of the well. The development water will be pumped into 55-gallon drums supplied by the Contractor. Wells with NAPL present will not be developed, and shall be at the discretion of the USACE representative.

4.5 WELL COMPLETION (OPTION)

Flush mount or steel riser completions shall be determined in the field by the USACE representative and shall depend on the site conditions. Wells with above-ground completions shall be constructed above the surface using a five-foot length of steel casing. Steel riser completions shall extend 2.5 feet above ground surface. The casing will be installed on the same day the grout is placed. Flush mounted well completions shall consist of appropriate monitoring well completion boxes with bolt-down or locking covers. The flush mount boxes shall have a drain hole installed to prevent water from accumulating in the box. A four-foot square protective concrete pad approximately six inches thick and three inches below ground surface will be poured around the steel casing. The pad shall slope away from the casing to prevent water from pooling adjacent to the casing. Protective steel posts shall be installed around each well with riser completions. A minimum of three posts, at least three feet high, shall encircle the well to protect against vehicular damage to the well. The location of the posts shall not impede access to the well by personnel and shall be located at least two feet from the well. A locking cover will be installed on top of the protective casing and locking expansion plugs are required for flush mounted wells. Padlocks will be provided by the Government and will be placed on each monitoring well.

4.6 DECONTAMINATION

The Contractor shall decontaminate all equipment that will be placed into the borehole and all equipment that may come in contact with soil samples. Equipment shall be decontaminated prior to and after each boring. All decontamination water shall be stored in portable tanks, see Section 4.2, or 55-gallon drums. The Contractor shall provide five, five-gallon buckets and three clean brushes for decontamination of the split spoon sampler. The Contractor shall wear clean nitrile gloves during decontamination activities. Water is available on-site for decontamination activities.

Decontamination procedures for drilling equipment shall be as follows:

- Rinse with a pressure steam cleaner,
- If visible dirt or oil is present on the equipment, wash with laboratory-grade, phosphate-free detergent and potable water, and rinse with pressure steam cleaner,
- Air dry

The Contractor shall decontaminate sampling equipment, including samplers and sample sleeves prior to each sample collection. Decontamination procedures are as follows:

- Wash with laboratory-grade phosphate-free detergent and water solution
- Rinse with potable water
- Rinse with ASTM Type II reagent-grade water
- Rinse with pesticide-grade acetone and pesticide-grade hexane
- Air dry

USACE shall construct a temporary decontamination pad at the former concrete pole washing area for use by the Contractor. The decontamination pad shall be used by the Contractor for steam cleaning drilling equipment while working on the McCormick Baxter property, the Contractor shall be required to furnish a decon pad for all off-site work (north of the slough). Water used for equipment decontamination shall be containerized and allowed to evaporate.

4.7 BOREHOLE ABANDONMENT

Once sampling of the borehole has been completed, the Contractor shall abandon the borehole. Halliburton Class G - 40 percent silica flour cement grout shall be used to abandoned the boreholes, with 7.5 to nine gallons of water per 90 pound sack of cement. Grouting material shall be mixed with a mechanical grout mixer and pumped through a tremie pipe in one continuous operation from the bottom of the interval to be sealed to the top. Boreholes will be abandoned in compliance with the state and county well abandonment requirements. The Contractor will use caution when abandoning bore holes over water.

4.8 INVESTIGATION-DERIVED WASTE

All soil cuttings and waste fluids generated will be separated and placed into 55-gallon drums by the Contractor. The Contractor shall furnish approximately 50 DOT approved 55-gallon drums and shall transport the drums to a centralized storage area onsite. *[The actual number of drums to be provided by the Contractor will be based on whether contingency borings will be drilled, and whether onsite facilities are capable of handling the wastewater volume.]* No drums will be left unattended at an off-site location. Drums shall *not* be filled to more than 75 percent capacity. Each drum shall be labeled by the USACE field personnel prior to relocation to the on-site storage area. The current storage site is located beneath a cover on the McCormick and Baxter Superfund site and is gated to limit access. Should the current facility reach capacity, another storage area will be designated by the USACE field personnel.

5.0 PROJECT SUBMITTALS

Prior to *any* onsite work, the Contractor will submit the following items to the USACE Project Leader. No mobilization will occur until the USACE Project Leader has reviewed the following documents:

- C-57 California State Water Well Drillers License
- Current 40-hour OSHA Certifications
- Certificate of Medical Surveillance
- Certificate of Respirator Fit Test
- Proof of Worker's Compensation Insurance
- Contractor's Site Health and Safety Plan (section 5.0 (*Approval of the Site Health and Safety plan is required by USACE prior to any mobilization to the site.*))
- Summary of Drill Rig Operator's Work Experience

The Contractor will address all USACE comments and a final version of the submittal will be provided to the USACE Project Engineer. The Contractor shall submit his Site & Safety Health Plan to the USACE 15 days after the Notice to Proceed. The Contractor must obtain USACE final approval of submittals a minimum of 12 days before mobilization to the site. If Option 3 is exercised the Contractor shall prepare a Site & Safety Health Plan Addendum to address potential hazards associated with barge drilling in accordance with Appendix A, the submittal shall be received by the USACE 14 calendar days before mobilization to the barge and shall be approved by the USACE before mobilization is allowed.

The Contractor shall provide to the USACE a daily report documenting the Contractors on-site personnel, the amount of drilling (footage), material used, hours worked, repairs completed (including down-time for repairs and anticipated repair completion schedule-if repair time exceeds work day), and any accidents or unusual events. This daily report shall be provided within 24 hours after the actual workday.

6.0 Health and Safety

OSHA Standard 29 CFR 1926.65(b) [Cal-OSHA Standard 8 CCR § 5192(b)] require employers to develop and implement a written Safety and Health Program (SHP) for employees involved in hazardous waste operations. The SHP documents the general safety and health program(s)/plan(s)/standard operating procedures(s) (SOPs). The Contractor shall provide written certification that the SHP has been developed and is being maintained. The Contractor shall make the SHP available upon request by the Government.

The site-specific program requirements of the OSHA Standards 29 CFR 1926.65 shall be integrated into one site -specific document, the Site Safety and Health Plan (SSHP). The SSHP shall interface with the Contractor's SHP. Any portions of the SHP that are referenced in the SSHP shall be included as appendices to the SSHP. The SSHP shall incorporate the requirements of: 29 CFR 1926.65 (8 CCR § 5192) (*Hazardous Waste Operations and Emergency Response*); 8 CCR § 3203 (*Injury and Illness Prevention Program*); Corps of Engineers EM 385-1-1 (*Accident Prevention Plan*); Appendix B of ER 385-1-92 (*Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OEW) Activities*); and other Federal, state, and local regulations. The Contractor's Health and Safety Manager shall sign and date the SSHP prior to submittal. Site work shall not commence on a project until the COR has accepted the SSHP. The Contractor shall reference Appendix A for details.

All personnel on site shall be equipped with Level D-modified clothing at all times. Modified Level D equipment includes the following:

- Hard hat
- Steeled-toed boots
- Safety glasses with side shields
- Hearing protection
- Nitrile gloves

Life vests and other water safety devices if option 4 is authorized.

All recordable accidents/injuries/illnesses shall be reported immediately. A completed ECG 3394, Accident Investigation Report shall be submitted within two working days in accordance with AR 385-40 and USACE Supplement 1 to the regulation. The Contractor shall submit the Safety and Health Plan to the USACE representative for approval prior to *any* on-site work. All comments shall be addressed and final approval by the USACE Project Engineer must be obtained by the Contractor prior to *any* mobilization and work at the site.

The Contractor shall assess the workplace to determine if hazards are present which necessitate the use of personal protective equipment. The Contractor's Certified Industrial Hygienist shall verify that the required workplace assessment has been performed through a written certification (29 CFR 1910.132). The Contractor shall specify minimum PPE ensembles (including respirators) necessary for each task/operation based on the hazard assessment. The Personal Protective Equipment shall establish and justify upgrade / downgrade / evacuation criteria based upon the action levels established. It is anticipated that EPA/OSHA Level C PPE may be required for this project.

6.0 USA UTILITY CLEARANCE

USA Utility clearance will be obtained by the USACE for the McCormick Baxter Property and associated sites.

7.0 PERIOD OF SERVICE

All work and services shall be complete 150-calendar days after notice to proceed.

All options shall be completed within the overall 150-calendar day period of service.

The work shall be scheduled for ten-hour days, starting at 0700 and ending at 1730. The work will be completed in increments of ten days on and four days off. Rescheduling shall be at direction of the USACE.

All work shall be scheduled and coordinated with the USACE Project Leader, Randy Olsen at (916) 557-5285. Fieldwork is scheduled to begin on or about 19 June 2000. Fourteen (calendar) day notice will be provided to the Contractor if Option 3 (drilling from barge) is authorized and twelve (calendar) days notice will be provided to the Contractor for all other options or for any changes made to the schedule or scope of work.

8.0 OPTIONS FOR ADDITIONAL SERVICES

The Government may require the Contractor to perform any and all the additional services stated in the Scope of Work. The Government may exercise the contract options at any time before 1 September 2000 at the stated option price.

9.0 CONTRACTOR CAUTION STATEMENT

The Contractor is cautioned to take no guidance from any source during the course of this work, which deviates from the requirements stated in this Scope of Work unless directed by the Contracting Officer. The Contractor shall immediately notify the USACE Project Engineer, Randy Olsen, of any guidance received that is not directed by the Contracting Officer.

Randy Olsen
Project Engineer

10.0 PRICING SCHEDULE

This pricing schedule shall be completed by the Contractor and submitted with any attachments as needed as the Contractor's official bid. The Contractor shall furnish labor, materials, equipment and incidental costs necessary for subsurface explorations at McCormick and Baxter Superfund Site, Stockton, California in accordance with the attached scope of work. The bid shall be into the USACE Contracting office by April 3, 2000.

Item No	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
001	Mobilization and Demobilization includes delivery and removal of all equipment and supplies to be furnished by the Contractor, restoration of the site to its original conditions, and submittals.	1	Job	Lump Sum (LS)	
002	Primary Boreholes-Drill Rig Rental for a maximum of two (2) borings to an approximate depth of 250 bgs, including equipment, labor, materials, supplies, and incidental costs. Labor includes, but is not limited to drilling of boreholes, sample collection, standby time caused by COE personnel, borehole abandonment, monitor well installation, transport of equipment, supplies and materials to on- and off-site location, and decontamination of equipment. Equipment includes but is not limited to, decontamination equipment, drill rig, water truck, equipment for collecting and transferring waste fluids to 55-gallon drums, for collection of soil samples, monitoring well installation equipment, and equipment for borehole abandonment.	110	Hr		
003	Primary Boreholes-Installation of a maximum of two (2) monitoring wells, includes all materials and supplies associated with well installation [i.e. mild/carbon steel casing, prepacked stainless steel wire wrapped well screen, dielectric couplings, bentonite plug, sand pack, Halliburton Class G-40 percent silica flour cement, centralizers (stainless steel and PVC), well completion (flush mount or steel riser completion) etc.]	500	Ft		
004	Primary Boreholes-Well Development. Rental of development rig and includes all equipment, labor, material and supplies for the development of a maximum of two (2) monitoring wells.	12	Hr		

Item No	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
005	Primary Boreholes-Borehole Abandonment. Baseline borings. Includes equipment, labor, materials and supplies. (Halliburton Class G-40 percent silica flour cement)	500	Ft		
006	Primary Boreholes-Security	250	Hr		
007	Primary Boreholes-DOT approved, clean, 55-gallon drums for containment and storage of soil cuttings and wastewater.	8	Ea.		
008	OPTION 1-Drill Rig Rental for a maximum of two (2) borings to an approximate depth of 250 bgs, including equipment, labor, materials, supplies, and incidental costs. Labor includes, but is not limited to drilling of boreholes, sample collection, standby time caused by COE personnel, borehole abandonment, monitor well installation, transport of equipment, supplies and materials to on- and off-site location, and decontamination of equipment. Equipment includes but is not limited to, decontamination equipment, drill rig, water truck, equipment for collecting and transferring waste fluids to 55-gallon drums, for collection of soil samples, monitoring well installation equipment, and equipment for borehole abandonment.	110	Hr		
009	OPTION 1-Installation of a maximum of two (2) monitoring wells, includes all materials and supplies associated with well installation [i.e. mild/carbon steel casing, prepacked stainless steel wire wrapped well screen, dielectric couplings, bentonite plug, sand pack, Halliburton Class G-40 percent silica flour cement, centralizers (stainless steel and PVC), well completion (flush mount or steel riser completion) etc.]	500	Ft		
010	OPTION 1-Well Development. Rental of development rig and includes all equipment, labor, material and supplies for the development of a maximum of two (2) monitoring wells.	12	Hr		
011	OPTION 1-Borehole Abandonment. Baseline borings. Includes equipment, labor, materials and supplies. (Halliburton Class G-40 percent silica flour cement)	500	Ft		
012	OPTION 1-Security	250	Hr		
013	OPTION 1-DOT approved, clean, 55-gallon drums for containment and storage of soil cuttings and wastewater.	8	Ea.		

Item No	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
014	OPTION 2-Drill Rig Rental for a maximum of five (5) borings to an approximate depth of 250 ft bgs, including equipment, labor, materials, supplies, and incidental costs. Labor includes, but is not limited to, drilling of boreholes, sample collection, standby time caused by COE personnel, borehole abandonment, transport of equipment, supplies and materials to on- and off-site locations, and the decontamination of equipment. Equipment includes, but is not limited to, decontamination equipment, drill rig, water truck, equipment for collecting and transferring waste fluids to 55-gallon drums, for collection of soil samples and monitoring well installation equipment, and equipment for borehole abandonment.	175	Hr		
015	OPTION 2-Borehole Abandonment. Baseline borings. Includes equipment, labor, materials and supplies. (Halliburton Class G-40 percent silica flour cement)	1250	Ft		
016	OPTION 2-Security	348	Hr		
017	OPTION 2-DOT approved, clean, 55-gallon drums for containment and storage of soil cuttings and wastewater.	20	Ea.		
018	OPTION 3-Drill Rig Rental for a maximum of five (5) borings from a barge to an approximate depth of 170 linear feet below the mud line, including equipment, labor, materials, supplies, and incidental costs. Labor includes, but is not limited to, drilling of boreholes, sample collection, standby time caused by COE personnel, borehole abandonment, transport of equipment, supplies and materials to on- and off-site locations, and the decontamination of equipment. Equipment includes, but is not limited to, decontamination equipment, drill rig, water truck, equipment for collecting and transferring waste fluids to 55-gallon drums, for collection of soil samples and monitoring well installation equipment, and equipment for borehole abandonment.	175	Hr		
019	OPTION 3-Mobilization and Demobilization includes delivery and removal of all equipment and supplies to be furnished by the Contractor, restoration of the site to its original conditions, and submittals.	1	Job	Lump Sum (LS)	

Item No	Description	Estimated Quantity	Unit	Unit Price	Estimated Amount
020	OPTION 3-Barge rental for a maximum of 18 days including equipment, labor, materials, supplies, and incidental costs. Equipment includes but is not limited to barge, equipment necessary to move the barge from on boring to the next, skiff and/or boat for daily off-loading and on-loading personnel, personal and marine safety equipment.	18	Daily		
021	OPTION 3-Borehole Abandonment. Contingency borings. Includes equipment, labor, materials and supplies. (Halliburton Class G-40 percent silica flour cement)	850	Ft		
022	OPTION 3-Security	348	Hr		
023	OPTION 3-DOT approved, clean, 55-gallon drums for containment and storage of soil cuttings and wastewater.	20	Ea.		
024	OPTION 4-Drill Rig Rental for a maximum of five (5) borings to an approximate depth of 250 ft bgs, including equipment, labor, materials, supplies, and incidental costs. Labor includes, but is not limited to, drilling of boreholes, sample collection, standby time caused by COE personnel, borehole abandonment, transport of equipment, supplies and materials to on- and off-site locations, and the decontamination of equipment. Equipment includes, but is not limited to, decontamination equipment, drill rig, water truck, equipment for collecting and transferring waste fluids to 55-gallon drums, for collection of soil samples and monitoring well installation equipment, and equipment for borehole abandonment.	175	Hr		
025	OPTION 4-Borehole Abandonment. Includes equipment, labor, materials and supplies. (Halliburton Class G-40 percent silica flour cement)	1250	Ft		
026	OPTION 4-Security	348	Hr		
027	OPTION 4-DOT approved, clean, 55-gallon drums for containment and storage of soil cuttings and wastewater.	20	Ea.		

Subtotal (without option item sets) \$ _____

Subtotal Option Item only \$ _____

GRAND TOTAL (includes base bid and option items) \$ _____

11.0 APPENDIX A SAFETY AND HEALTH

1. General Requirements:

A critical Contractor performance evaluation factor throughout all aspects of the rotary sonic drilling and optional barge mounted rotary sonic drilling operation is the safety and health of affected on-site personnel, potential off-site receptors, and the protection of the environment. Accordingly, detailed safety and health criteria, practices, and procedures shall be developed and implemented to provide proper control of and protection against the unique safety, chemical, physical, radiological and biological hazards. This appendix describes in general terms, the minimum Contractor safety, health and emergency response requirements for activities which involve employee exposure or the reasonable possibility for employee exposure to safety and health hazards.

The Contractor shall have an ongoing Safety and Health Program (SHP) meeting the most current requirements of Federal, California, USACE, and local laws, regulations, and guidance. In addition, the Contractor shall prepare, implement, and enforce a Site Safety and Health Plan (SSHP) for all site work performed under this contract. The Contractor shall ensure that all safety and health provisions are followed by their subcontractors, suppliers and support personnel. The Contractor shall utilize the services of qualified personnel, as defined in Appendix B of ER 385-1-92 and this appendix, to oversee the development and implementation of required safety and health documents.

2. References:

- a. United States Army Corps of Engineers (USACE), *Safety and Health Requirements Manual*, EM 385-1-1, September 1996
- b. USACE, *Safety and Occupational Health Document Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) and Ordnance and Explosive Waste (OWE) Activities*, ER 385-1-92, March 18, 1994
- c. Occupational Safety and Health Administration (OSHA) Standards 29 CFR 1910, *Occupational Safety and Health Standards*
- d. OSHA Standards 29 CFR 1926, *Safety and Health Regulations for Construction*
- e. OSHA 29 CFR 1926.65, *Hazardous Waste Operations and Emergency Response*
- f. OSHA 29 CFR 1910.132, *Personal Protective Equipment, General Requirements*
- g. OSHA 29 CFR 1915, *Occupational Safety and Health Standards for Shipyard Employment*
- h. United States Coast Guard (USCG), 33 CFR, *Navigation and Navigable Waters*

- i. Federal Acquisition Regulation, F.A.R. Clause 52.236-13: Accident Prevention
 - j. Nuclear Regulatory Commission Standards (NRC), 10 CFR 20, *Standards for Protection Against Radiation*
 - k. NIOSH/OSHA/USCG/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, October 1985
 - l. EPA, "Standard Operating Safety Guides", July 1988
 - m. American Conference of Governmental Industrial Hygienists (ACGIH), *1999 TLVs[®] and BELs[®], Threshold Limit Values for Chemical Substances and Physical Agents*.
 - n. CAL-OSHA, 8 CCR Chapter 4, Subchapter 7, *General Safety Orders*
 - o. CAL-OSHA, 8 CCR Chapter 4, Subchapter 4, *Construction Safety Orders*
 - p. Other State, local, and regional safety and health requirements
3. Definitions The following definitions are provided to help the Contractor to fully understand the various requirements of this appendix.
- a. Accident Prevention Plan (APP): A written plan which describes work to be performed and measures to be taken to control hazards associated with materials, services, or equipment. The SSHP may serve as the APP provided it addresses all content requirements of EM 385-1-1 (Appendix A).
 - b. Activity Hazard Analysis: A written form which defines the activities to be performed and identifies the sequence of work, the specific hazards anticipated, and the control measures to be implemented. The format shall be in accordance with EM 385-1-1 (Figure 1-1).
 - c. Emergency Response Plan: A written plan, which becomes part of the SSHP, to handle anticipated emergencies.
 - d. Safety and Health Program (SHP): A written safety and health program which describes general occupational safety and health requirements.
 - e. Site Safety and Health Plan (SSHP): A written plan which describes the site-specific methods by which personnel will meet the safety and health requirements. A SSHP shall be developed for each facility.
 - f. Injury and Illness Prevention Program (IIPP): The SSHP may serve as the IIPP provided it addresses all content requirements of by 8 CCR § 3203.

4. Safety and Health Program (SHP): All Contractors and subcontractors performing on-site hazardous waste activities are required to develop and implement a written Safety and Health Program (general safety and health program elements), in compliance with the requirements of OSHA standard 29 CFR 1926.65 (b)(1) through (b)(4). The Contractor shall provide written certification that the SHP has been developed and is being maintained. The Contractor shall make the SHP available upon request by the Government. Any portions of the SHP that are referenced in the SSHP shall be included as appendices to the SSHP.
5. Site Safety and Health Plan (SSHP): The Contractor shall prepare the detailed site-specific safety and health elements as described in this appendix. The SSHP shall be designed to identify, evaluate, and control safety, health, biological, and radiological hazards, and provide for emergency response. All subcontractors shall comply with the Contractor's SSHP. The SSHP shall be developed, approved and implemented by a Certified Industrial Hygienist (CIH) and shall comply with all Federal, state, regional and local health and safety requirements. Matters of interpretation of standards shall be submitted to the appropriate administrative agency for resolution. The SSHP shall be kept on site and incorporate the elements contained in Appendix B of ER 385-1-92 and as amplified in this appendix. Some requirements of this section are not intended to dictate site operations and procedures for safety and health, but to specify what information pertaining to the Contractor's safety and health program is required to be presented in the submittal. Where a specific element is not applicable, the Contractor shall make negative declaration in the plan to establish that adequate consideration was given the topic, and a brief justification for its omission. The CIH and Project Manager shall sign and date the SSHP. Daily safety and health inspections shall be conducted to determine if site operations are conducted in accordance with the approved SSHP, OSHA, USACE, and contract requirements. The Contractor shall correct any deficiencies. The SSHP shall address the safety and health hazards of each phase of site operation. Details about some activities may not be available when the initial SSHP is prepared and submitted. Therefore, the SSHP shall address, in as much detail as possible, all anticipated tasks, their related hazards and anticipated control measures. Further details shall be included in the activity hazard analyses.

The final SSHP generated by the Contractor under this contract shall be furnished to the CO in MS Word 6.0 or higher software, IBM PC compatible format.

- a. Acceptance and Modification: The SSHP shall be submitted to the Contracting Officer (CO) for review prior to on-site activities. The CO will review the SSHP to determine if it meets the intent of the safety and health requirements specified. Deficiencies will be brought to the attention of the Contractor, and the Contractor shall revise the SSHP to correct the deficiencies. The Contractor shall not perform any on-site work until the SSHP has been accepted by the CO, and the Contractor is in full compliance with its terms. Changes and modifications to the SSHP shall be made by the Contractor's CIH with the concurrence of the CO. All hazardous waste operations shall be performed according to the approved SSHP. Any violations of the provisions of the SSHP shall be cause for stopping all affected work until the matter has been corrected.
- b. Site Safety and Health Plan Elements: As a minimum, the SSHP shall contain the following elements of ER 385-1-92 and as amplified in this appendix.
 1. Site Description and Contamination Characterization: The Contractor shall describe the site location, topography, approximate size, and the past uses of the site. Compile a complete list of the contaminants found or known to be present in site areas to be impacted by work performed.

Compilation of this listing shall be based on results of previous studies; or, if not available, select the likely contaminants based on site history and prior site uses/activities. Include, as applicable, the chemical names media in which found, locations on site, and estimated quantities/volumes to be impacted by site work.

2. Hazard Assessment and Risk Analysis: The Contractor shall provide a complete description of the work to be performed. The Contractor shall identify the chemical, physical, biological, radiological, and safety hazards that may be encountered for each task. Each task is to be discussed separately. A table showing chemical hazards anticipated on-site along with chemical names, concentration ranges, media in which found, locations on-site, estimated quantities/volumes, the applicable OSHA regulatory standards (PELs - TWA, STEL, ceiling concentrations, and skin designation), the most current American Conference of Governmental Industrial Hygienist (ACGIH) Threshold Limit Values (TLVs) and NIOSH recommended exposure levels (RELs), ionization potential, cancer designation (e.g., Prop 65 identification), routes and sources of exposure, and physical and toxicological properties shall be provided. Selection of chemicals as indicators of hazard shall be based on media concentrations, toxicity, volatility, or potential for air entrainment at hazardous levels, and frequency of detection. The Contractor shall specify and justify action levels based upon airborne exposure concentrations and direct skin contact potentials for upgrades and/or downgrades in personal protective equipment levels, implementation of engineering controls and work practice controls, for emergency evacuation of onsite personnel, and for the prevention and/or minimization of public exposure to hazards created by onsite activities. The Contractor shall evaluate exposure to hazardous substances brought on site for the execution of site activities; the potential for injuries from site conditions and activities (e.g., excavation, slips, trips, and falls, electricity, equipment and machinery, etc.); potential for injury from physical agents (e.g., noise, heat and cold stress, vibration, non-ionizing radiation, solar radiation, etc.); the risk to human health from radioactive materials or ionizing radiation; the potential for illness due to biological agents (e.g., poisonous plants, animals, insects, microorganisms, etc).
3. Staff Organization, Qualification, and Responsibility: Each person assigned specific safety and health responsibilities shall be identified, and their qualifications and experience documented by resume in the SSHP. The organizational structure, with lines of authority and overall responsibilities for safety and health of the Contractor and all subcontractors shall be discussed. An organizational chart showing the lines of authority for safety shall be provided. The Contractor shall obtain the Contracting Officer's acceptance before replacing any member of the safety and health staff. The request shall include the name and qualifications of each proposed replacement.
 - a. Project Superintendent: The Contractor shall provide evidence that the Contractor's full-time onsite project superintendent is designated as, and is qualified to be a competent person through training in accordance with 29 CFR 1926.32 and 29 CFR 1926.65. The project superintendent shall be experienced in the administration and supervision of hazardous waste projects, including work practices, investigative methods, protective measures for personnel, inspection of work areas, generated waste containment and disposal procedures, decontamination units installation and maintenance requirements, and site safety and health requirements. This designated onsite superintendent shall be responsible for compliance with applicable Federal, state and local requirements, and the Contractor's SSHP. The Contractor shall submit evidence that this person has a minimum of 2 years on-the-job hazardous waste operations supervisory experience.

- b. Certified Industrial Hygienist: The Contractor shall utilize the services of an Industrial Hygienist certified by the American Board of Industrial Hygiene (ABIH) to prepare the Contractor's SSHP, perform initial site-specific training, direct air monitoring and assist the Contractor's superintendent in implementing and ensuring safety and health requirements are complied with during the performance of all work. The CIH shall visit the site at least once per month for the duration of activities and be available for emergencies, and on a weekly basis, review results of air monitoring and accident reports. The CIH shall have a minimum of two (2) years of comprehensive experience in planning and overseeing hazardous waste activities.
- c. Site Safety and Health Officer (SSHO). It is not anticipated that the CIH will be on-site continuously throughout the course of the project. Day-to-day industrial hygiene and safety support, including air monitoring, training, daily site safety inspections, shall be provided by a designated SSHO who shall report directly to the CIH. The Contractor shall ensure the SSHO has a minimum of two (2) years working experience in the chemical industry and/or chemical waste disposal industry where EPA Level C personal protective equipment was required, a sound working knowledge of Federal and state occupational safety and health regulations, and training in air monitoring practices and techniques. The SSHO shall be assigned to the site at all times when hazardous waste operations are being performed. The SSHO shall have authority to stop work. If the Contractor's operations are performed during more than one work shift per day, a SSHO shall be present for each shift.
- d. Persons Trained in First Aid/CPR. The Contractor shall maintain on-site any time hazardous waste operations are conducted at least two persons who are currently trained in first aid and CPR by the American Red Cross or other agency. These persons shall also meet the training requirements specified by the Bloodborne Pathogens standard, 29 CFR 1910.1030. These persons may perform other duties but must be immediately available to render first aid when needed. The names and documentation of training shall be provided.
- e. Occupational Physician. The Contractor shall utilize the services of a licensed physician who is certified in occupational medicine by the American Board of Preventative Medicine, or who, by necessary training and experience is Board eligible to manage the medical surveillance program. The Physician shall have extensive experience in the occupational health area and be familiar with this site's hazards and the scope of this project. The Contractor shall submit, in writing, the medical consultant's name, qualifications, and knowledge of the site's conditions and proposed activities. The physician shall be responsible for developing and implementing a medical monitoring program in compliance with 29 CFR 1926.65.
- f. Testing Laboratory: The Contractor shall provide the name, address and telephone number of each testing laboratory selected to perform the occupational sample analyses and report the results. Written verification of the following criteria, signed by the testing laboratory principal and the Contractor shall be submitted: 1) The laboratory is proficient to conduct personnel, area, and environmental analysis for organic and inorganic chemicals. The laboratory shall be fully equipped to analyze the required NIOSH, OSHA, and EPA analyses; 2) The laboratory is currently participating in the American Industrial

Hygiene Association (AIHA) Proficiency Analytical Testing (PAT) Program and is certified by AIHA.

4. Chemical Information and Material Safety Data Sheets: Prior to the commencement of work, all available information concerning the chemical, physical, and toxicologic properties of each substance known or expected to be present on site shall be made available to the affected employees. Material Safety Data Sheets (MSDSs) are required for chemicals brought onsite. This information shall also be included in the SSHP.
5. Accident Prevention: Daily safety and health inspections shall be conducted to determine if site operations are in accordance with the approved SSHP, OSHA, USACE, and contract requirements. In the event of an accident or incident, the Contractor shall immediately notify the CO. Within two working days of any reportable accident/injury/illness, the Contractor shall complete and submit to the CO an Accident Report on ENG Form 3394 in accordance with AR 385-40 and USACE Supplements to that regulation.
6. Training: Although OSHA regulations permit varying levels of training based on employee responsibility and exposure potential, the Contractor shall provide training to include: a) initial, for all personnel (forty hours of formal off-site hazardous waste activity training, and three days field experience under the direct supervision of a trained experienced supervisor), b) supervisory (an additional eight hours supervisory training for supervisory personnel), c) site specific, and d) refresher training. Worker courses taken more than one year prior to commencement of work are acceptable provided that the individual has successfully completed the annual refresher training. All persons entering an exclusion or contamination reduction zone shall be given a pre-entry site safety and health briefing. The content, duration, and frequency, of training required for that person shall be described and verified. The Contractor shall append copies of training certificates for its employees to the SSHP.
7. Personal Protective Equipment: A written Personal Protective Equipment (PPE) Program shall be provided in the SSHP. The program shall address all the elements of 29 CFR 1926.65(g)(5) and 29 CFR 1910.134. The Contractor shall specify minimum PPE ensembles (including respirators) necessary for each task/operation based on the hazard assessment/risk analysis, including potential heat stress and associated safety hazards. The plan shall include specific types and materials for protective clothing and respiratory protection. The plan shall establish and justify upgrade/downgrade/evacuation criteria based upon the action levels established. Site workers must have a current medical "fit-for-duty" clearance to use respiratory and other PPE.
8. Medical Surveillance: All personnel performing on-site activities shall participate in an ongoing medical surveillance program meeting the requirements of 29 CFR 1926.65, and ANSI Z-88.2. The medical examination protocols and results shall be overseen by a licensed physician who is certified in Occupational Medicine by the American Board of Preventive Medicine, or who by necessary training and experience is board eligible. Minimum specific examination content and frequency based on probable site conditions, potential occupational exposures and required protective equipment shall be provided. Certification of employees' participation in the medical surveillance program and the written opinion from the attending physician shall be appended to the SSHP.
9. Radiation Dosimetry: Not Anticipated.

10. Exposure Monitoring/Air Sampling Program: Where it has been determined that there may be potential employee exposures to and/or off-site migration of hazardous concentrations of airborne substances, appropriate direct-reading (real-time) air monitoring and time-integrated (time-weighted average [TWA]) air sampling shall be conducted in accordance with applicable regulations (i.e., OSHA, EPA, NRC, California State). Air monitoring and air sampling must accurately represent concentrations of airborne contaminants encountered on, and leaving, the site. Sampling and analytical methods following NIOSH criteria (for on-site personnel), and EPA (for site perimeter or off-site locations) shall be appropriately utilized. Personnel samples shall be analyzed only by laboratories successfully participating in, and meeting the requirements of the American Industrial Hygiene Association's Proficiency Analytical Testing or Laboratory Accreditation Program. Representative meteorological data shall be evaluated and used as an adjunct in determining site layout, and perimeter and any off-site monitoring locations. Where perimeter monitoring/sampling is not deemed necessary, a suitable justification for its exclusion shall be provided. Noise monitoring shall be conducted as needed, depending on the hazard/risk analysis. All monitoring/sampling results shall be evaluated and appropriate action implemented based upon "action levels". All personnel exposure monitoring records shall be maintained in accordance with 29 CFR 1910.20.
11. Heat/Cold Stress Monitoring: Heat and /or cold stress monitoring protocols shall be specified and implemented, as appropriate. Physiological monitoring protocols and work/rest schedules shall be developed. The NIOSH/OSHA/ USCG/EPA "Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities" provides protocols for prevention of heat stress. Heat stress monitoring shall commence at temperatures of 70 degrees Fahrenheit and above. Cold stress monitoring, to help prevent frostbite and hypothermia, shall be conducted following the most current published American Conference of Governmental Industrial Hygienist (ACGIH) Cold stress standards.
12. Standard Operating Safety Procedures, Engineering Controls and Work Practices: a) Site rules/prohibitions (buddy system, eating/drinking/smoking restrictions, etc.); b) Work permit requirements (e.g., radioactive work, excavation, hot work, confined space, etc.); c) Material handling procedures (soils, liquids, radioactive materials); d) Drum/container handling procedures and precautions (opening, sampling, overpacking); e) Confined space entry procedures; f) Hot work, sources of ignition, fire protection/prevention, and electrical safety (ground-fault protection, overhead power line avoidance, etc.); g) Excavation and trench safety; h) Guarding of machinery and equipment; i) Lockout/Tagout; j) Fall protection; k) Hazard Communication; l) Illumination; m) Sanitation; n) Engineering controls; o) Process Safety Management; p) Signs and labels.
13. Site Control Measures: The Contractor shall establish work zones. Access points and work zone delineation (Exclusion Zone, Contamination Reduction Zone, Support Zone) shall be based upon the contamination characterization data and the hazard/risk analysis performed. Include a site map delineating the zones. Describe on-site and off-site communications. Describe site security (physical and procedural). Describe general site access.
14. Personal Hygiene and Decontamination: Specify necessary facilities and their locations. Provide detailed standard operating procedures, frequencies, supplies, and materials to accomplish decontamination of site personnel.
15. Equipment Decontamination: Specify necessary facilities, equipment and their locations. Provide detailed procedures, frequencies, supplies, materials for decontamination, and methods to determine adequacy of decontamination of equipment used on site. For sites where radioactive

contamination is present, include levels of removal and fixed contamination acceptable for release from the exclusion zone.

16. Emergency Equipment and First Aid Requirements:
17. Emergency Response and Contingency Procedures (on-site and off-site): Local fire/police/rescue authorities having jurisdiction and nearby medical facilities that could be utilized for emergency treatment of injured personnel shall be contacted in order to notify them of upcoming site activities and potential emergency situations, to ascertain their response capabilities, and to obtain a response commitment. An Emergency Response Plan, which complies with 29 CFR 1926.65(l), and which, as a minimum, addresses the following elements, shall be developed and implemented: 1) Pre-emergency planning and procedures for reporting incidents to appropriate government agencies for potential chemical exposures, personal injuries, fires/explosions, environmental spills and releases, discovery of radioactive materials; 2) Personnel roles, lines of authority, communications; 3) Posted instructions and list of emergency contacts: physician/nearby medical facility, fire and police departments, ambulance service, federal/state/local environmental agencies, CIH, Contracting Officer; 4) Emergency recognition and prevention; 5) Site topography, layout, and prevailing weather conditions; 6) Criteria and procedures for site evacuation (emergency alerting procedures/employee alarm system, emergency PPE and equipment, safe distances, places of refuge, evacuation routes, site security and control); 7) Specific procedures for decontamination and medical treatment of injured personnel; 8) Route maps to nearest pre-notified medical facility; 9) Criteria for initiating community alert program, contacts and responsibilities; 10) Critique of emergency responses and follow-up. If all personnel will be evacuated from the site and not allowed to assist in handling the emergency, the emergency response plan may be replaced by an emergency action plan complying with 29 CFR 1910.38(a).
18. Logs, Reports, and Recordkeeping: The following logs, reports, and records shall be developed, retained, and submitted to the CO: 1) Training logs (site-specific and visitor), and records of radiological instructions and notices to workers; 2) Daily safety inspection logs (may be part of the Daily QC Reports); 3) Equipment maintenance logs; 4) Employee/visitor register; and 5) Environmental and personal exposure monitoring/sampling results.
19. Accident Prevention Plan: The SSHP may serve as the Accident Prevention Plan provided it addresses all content requirements of 29 CFR 1926.65, EM 385-1-1 (Appendix A). The Accident Prevention Plan elements required by EM 385-1-1 but not specifically covered in the SSHP shall be addressed in this section. The Accident Prevention Plan shall be attached to and become part of the SSHP.
20. Activity Hazard Analyses: The Contractor shall prepare an Activity Hazard Analysis for each phase of work. The format shall be in accordance with EM 385-1-1 (Figure 1-1). The analysis shall define the activities to be performed and identify the sequence of work, the specific hazards anticipated, and the control measures to be implemented to eliminate or reduce each hazard to an acceptable level. Work shall not proceed on that phase until the activity hazard analysis has been accepted and a preparatory meeting has been conducted by the Contractor to discuss its contents with everyone engaged in the activities, including the government onsite representatives. The activity hazard analyses shall be continuously reviewed and when appropriate modified to address changing site conditions or operations, with the concurrence of the CIH, the Site Superintendent, and the CO. Activity hazard analyses shall be attached to and become a part of the SSHP.

21. Emergency Response and Contingency Procedures: Emergency Response and Contingency Procedures as required by 29 CFR 1926.65 shall be prepared. The following emergency equipment items shall be immediately available for on-site use: (1) First aid equipment and supplies approved by the consulting physician; (2) Emergency eyewashes/showers; (3) Emergency respirators; (4) Spill control materials and equipment; and (5) Fire extinguishers. The Contractor shall provide telephone numbers and points of contact for emergency services and the appropriate Governmental Representatives. A map showing the route to the hospital that has been contacted and informed of the type of work and potential hazards on the site shall be provided.

22. Certification of Hazard Assessment: The Contractor shall assess the workplace to determine if hazards are present which necessitate the use of personal protective equipment. The Contractor shall verify that the required workplace hazard assessment has been performed through a written certification (29 CFR 1910.132).