U.S. ARMY ENVIRONMENTAL CENTER

PROPERTY MANAGEMENT PLAN
FOR LAND USE CONTROL ACTIONS
RIVERBANK ARMY AMMUNITION PLANT

Prepared by

Engineering Strategies Corporation

Draft Final
November 2006

EXHIBIT H

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BRAC	Base Realignment and Closure
CACA	Corrective action Consent Agreement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DoD	Department of Defense
DTSC	Department of Toxic Substances Control
EP	Evaporation/Percolation
FFA	Federal Facility Agreement
FOST	Finding of Suitability to Transfer
FS	Feasibility Study
GOCO	government-owned/contractor-operated
IPRGs	Industrial Preliminary Remediation Goals
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant
LTM	Long Term Monitoring
LUC	Land Use Controls
LUCC	Land Use Controls Coordinator
MCLs	Maximum Contaminant Levels
µg/L	Microgram per Liter
NCP	National Contingency Plan
NPL	National Priority List
O&M	Operations and Maintenance
PMP	Property Management Plan
RA	Remedial Action
RBAAP	Riverbank Army Ammunition Plant
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFI	RCRA Facilities Investigation
RI	Remedial Investigation
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SARA	Superfund Amendments and Reauthorization Act
SWMU	Solid Waste Management Unit
TSDF	Treatment, Storage and Disposal Facility
USAEC	U.S. Army Environmental Center

1.0 INTRODUCTION

Riverbank Army Ammunition Plant (RBAAP) is a government-owned/contractor-operated (GOCO) industrial installation under the jurisdiction of the U.S. Army Joint Munitions Command. The facility is located at 5300 Claus Road, Riverbank, Stanislaus County, California (See **Figure 1**). RBAAP is a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priority List (NPL) site listed on February 21, 1990 and is currently responsible for environmental Remedial Actions as specified in the 1994 Record of Decision (ROD). In addition, RBAAP holds a Resource Conservation and Recovery Act (RCRA) Part B Hazardous Waste Facility Permit (Permit No. CA7210020759).

Based on the regulatory review of the 2nd CERCLA Five-Year Review, it was determined that the RBAAP 1994 ROD and subsequent design documents did not address sufficient details concerning land use controls and their implementation [**U.S. Environmental Protection Agency** (**USEPA), 2005 and DTSC, 2005]**). As a result, this Property Management Plan (PMP) has been developed to address and clearly define land use controls currently associated with those sites identified in the 1994 ROD and areas which have not been cleaned up or evaluated to allow for unrestricted use.

In November 2005, RBAAP was slated for closure by Congress as part of the 2005 Base Realignment and Closure (BRAC). Future transfer of the property from the Army will include a CERCLA 120(h)(3) covenant which will have a description of the residual contamination on the property and the environmental use restrictions, expressly prohibiting activities inconsistent with restrictions placed on the property. All necessary land use controls including those outlined in this document along with any additional use restrictions required to ensure future protection of human health and the environment will be included in the environmental protection provisions of future BRAC transfer documents and subsequent deed at the time of transfer.

The specific implementation actions for the sites appended to this document contain detailed requirements tailored specifically for each individual site. The specific implementation actions outline such items such as use restrictions placed on the site, maintenance requirements, inspection requirements and other details necessary to protect human health and the environment.

Primary documents related to the sites addressed in this PMP are maintained at the RBAAP Administrative Record Repository located in Administration Building 16 at the RBAAP. The PMP will also be maintained at the RBAAP Administrative Record Repository. The reader is referred to the following primary source documents for additional details concerning the sites and remedial actions taken.

TABLE 1 RBAAP PRIMARY SOURCE DOCUMENTS		
Document Title	**Author**	**Date**
CERCLA Documents		
Riverbank Army Ammunition Plant Landfill Closure-Revised Closure/Post Closure Maintenance Plan	CH2MHill	May 1996
Riverbank Army Ammunition Plant Landfill Closure – Final Closure Report	U.S. Army Corps of Engineers, Sacramento District	January 30, 1996
Record of Decision	U.S. Army Environmental Center	1994
Riverbank Army Ammunition Plant Remedial Investigation Report.	Roy F. Weston, Inc.	1991
Riverbank Army Ammunition Plant Remedial Investigation Report Addendum	Roy F. Weston, Inc.	1991
Remedial Investigation (RI) Report – Riverbank Army Ammunition Plant	Roy F. Weston, Inc.	February 1992
Feasibility Study (FS) Report	Roy F. Weston, Inc.	June 1993
First Five-Year Review Report for Riverbank Army Ammunition Plant	U.S. Army	February 20, 2001
Preliminary Close Out Report	USEPA	January 1997
RCRA Documents		
Corrective Action Consent Agreement, Riverbank Army Ammunition Plant	Department of Toxic Substances Control	2002
RCRA Part B permit CA7210020759 (05-SAC-06)	CA Dept of Toxic Substances Control	May 6 2006, expires May 6, 2016
RCRA Facility Investigation Report	CH2MHill	February 4, 2005
RCRA Facility Investigation Current Conditions Report	CH2MHill	2002

2.0 PURPOSE/OVERVIEW

The PMP outlines the administrative procedures and processes, which RBAAP personnel, the Army or future property owners will use to administer the land use controls program for the installation. Land use controls are necessary since contaminants remain at the RBAAP above levels that allow for unrestricted use. In addition, RBAAP contains a RCRA unit identified as Solid Waste Management Unit (SWMU) 1 Industrial Wastewater Treatment Plant (IWTP) subject to future closure requirements.

The objective of this PMP is the preservation of controls put in place to protect human health and the environment at those sites identified in the 1994 ROD requiring remedial action. The two response actions addressed in the ROD included:

- A groundwater response action [Installation Restoration Program (IRP) Site RBAAP-003];
- A landfill response action (IRP Site RBAAP-001).

The groundwater response action requires containment of the chromium contamination in excess of 50µg/L and cyanide contamination in excess of 200 µg/L and long term monitoring (LTM). The landfill response action required installation of an appropriate final cover for the landfill and LTM. Both of these response actions have been implemented. In addition, the ROD included the following contingency actions: future investigation of the IWTP at the time of permit closure and additional remediation of groundwater if the shallow aquifer A-zone recharges in the future.

Remedial actions and investigations at RBAAP assumed continued industrial use of the property and in most cases utilized EPA Region 9 industrial preliminary remediation goals (IPRGs) for soils in industrial areas. As a result, the main production areas with the exception of the currently leased grazing area will be restricted for industrial use and will require use restrictions as environmental protection provisions in future BRAC transfer documents and deed at the time of property transfer.

3.0 RBAAP BACKGROUND/ CURRENT LAND USE

RBAAP is a GOCO industrial installation under the jurisdiction of the U.S. Army Joint Munitions Command. The facility has been slated for closure under the BRAC 2005 Law which was enacted by Congress in November 2005. The current operating contractor is NI Industries, Inc., which has operated the facility since early 1952. The facility is located at 5300 Claus Road, Riverbank, Stanislaus County, California, one mile south of the Stanislaus-San Joaquin County border and approximately ten miles northeast of the City of Modesto.

Environmental remediation at the RBAAP is currently being undertaken pursuant to CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), and National Contingency Plan (NCP) requirements, under the regulatory supervision of the USEPA, State of California Department of Toxic Substances Control (DTSC) and the State of California Regional Water Quality Control Board (RWQCB). Remedial activities at RBAAP are undertaken in accordance with the Federal Facility Agreement (FFA) (**U.S. Army, 1990**). The FFA was signed after RBAAP was added to the NPL on February 21, 1990. In addition, on July 30, 1995, DTSC issued a RCRA Part B Hazardous Waste Facility Permit for RBAAP. In addition to monitoring and reporting requirements for the facility, the permit required the Army to conduct a RCRA Facilities Investigation (RFI) for the SWMUs and areas of concern (AOCs). The RFI was completed by the Army in 2005 (**CH2MHill, 2005**).

3.1 Land Use

The facility occupies a total of 173 acres of land and consists of two non-contiguous areas represented by the main plant area (approx 146 acres) and the Evaporation/Percolation (EP) Ponds (27 acres) which are located approximately 1.5 miles north of the RBAAP Plant boundary

along the Stanislaus River. The RBAAP property is zoned as M for commercial/industrial use. RBAAP is bordered on the north, west and south by sparse residential areas, with a housing community lying west of the plant. RBAAP is bordered on the east by pastureland. Riverbank has a population of 16,400 and the nearest large community is Modesto located 10 miles southwest of the installation and having a population of 210,000. RBAAP activities are currently limited to the operation of the mortar production line, layaway of idle facilities, limited manufacturing and technology updates, and maintenance and protection of the overall facility. In addition, various buildings at the facility have been leased out to private businesses that conduct a variety of light to heavy industrial activities. The general classification of the RBAAP property is as follows and displayed on **Figure 2**:

- 99 acres used for the RBAAP Production and various industrial tenants;
- 37 acres leased as pasture land grazing;
- 10 acres covered by roads, right of way, open air storage, open space including landfill site and easements;
- 27 acres occupied by the EP ponds located 1.5 miles north of the plant.

RBAAP will continue to function as a Department of Defense (DoD) industrial installation and industrial park until BRAC transfer occurs. With the exception of the 37 areas leased for grazing, the property will be maintained solely for DoD industrial and leased industrial use until the time of transfer. As stated above at the time of transfer the RBAAP property will require additional use restrictions as environmental protection provisions in future transfer documents and deed due to the presence of contamination in groundwater and soils above applicable standards for unrestricted use.

4.0 RBAAP ENVIRONMENTAL CLEANUP PROGRAM OVERVIEW

4.1 Past Actions and Current Status Under CERCLA

The Installation Restoration Program activities at RBAAP began in 1979 with an Installation Assessment. The Assessment concluded that areas of the RBAAP and the waste disposal ponds located off-site were potentially contaminated with heavy metals and other chemicals as a result of procedures used in past manufacturing operations and waste disposal practices. The assessment also indicated the potential for migration of the contaminants into the subsurface soils and waters.

The USEPA initially proposed RBAAP for inclusion on the NPL on June 24, 1988 and added it to the final list on February 21,1990. A FFA was signed on April 5, 1990. Under this agreement, the Army agreed to complete the RI/FS and, eventually, perform the Remedial Design (RD) and implement the Remedial Action (RA) to address the environmental contamination at RBAAP.

In addition to the on-site RBAAP RI activities, an off-site residential well sampling program was established in September 1985. The residential well sampling program consisted of the quarterly sampling of approximately 70 wells located west of the RBAAP boundary. Water samples from six wells located west of the RBAAP showed levels of chromium in excess of 50 mg/L (drinking water standard). The initial response included the provision of bottled drinking water to those

affected residents followed by the installation of deep replacement wells. This action was followed in 1992 with the extension of the Riverbank City water system which connected services to all potentially affected residents. Extensive characterization of the E/P ponds was also completed during the RI phase and based on the RI findings, a removal action was completed in 1993 to address zinc-contaminated soil. The 1994 site wide ROD which addressed groundwater contamination and the landfill also documented the E/P Pond removal action in detail and concluded that no further action was necessary at the ponds (**USAEC, 1994**).

Historically eleven sites were identified and addressed under the IRP Program as follows:

RBAAP-001: Landfill;
RBAAP-002: Waste Salt Disposal Pit;
RBAAP-003: Groundwater Contamination Resulting from historical practices at the IWTP Currently titled (Groundwater Treatment Plant);
RBAAP-004: IWTP Effluent Sewer Line Break;
RBAAP-005: Bldg 13 Chromium Pretreatment;
RBAAP-006: H2SO4 Spill;
RBAAP-007: Phosphoric Acid Spill;
RBAAP-008: SE Storm Reservoir;
RBAAP-009: NW Storm Reservoir;
RBAAP-010: Sewage Treatment Plant/Sludge Beds;
RBAAP-011: E/P Ponds.

1994 Record of Decision: The RI/FS which addressed the investigation of the sites was completed in 1993 (**Weston, 1991, 1992, 1993b**). In March 1994, the USEPA, DTSC, RWQCB, and the Army signed the ROD for the RBAAP (**USAEC, 1994**). The site wide ROD contained two response actions that address the media of concern at RBAAP and documents that no further action is required at the remaining sites. The two response actions were as follows:

- A groundwater response action (IRP Site RBAAP-003): The groundwater response action requires containment of the chromium plumes contamination in excess of 50 ppb and cyanide contamination in excess of 200 ppb and LTM.
- A landfill response action (IRP Site RBAAP-001). The landfill response action required installation of an appropriate final cover for the landfill and LTM.

In addition, the ROD mentioned additional actions that may need to be addressed in the future which include:

- Investigation of the IWTP
- Recharge of the A-zone.

The IWTP remains an active unit treating waste under a RCRA Part B Permit identified as SWMU 1 (See Discussion Below under RCRA). The DTSC has indicated that additional sampling of soil will be required under each unit at the IWTP when this system goes through permit closure. The second post-ROD action consists of continued monitoring of the A-zone to assess whether it

recharges, and if it does recharge, investigation of the extent of contamination. If groundwater cleanup levels are exceeded, the A zone groundwater would then need to be remediated.

In September 1997, the USEPA, DTSC, RWQCB, and the Army signed the Preliminary Closeout Report for construction of the RAs required in the 1994 ROD (**USEPA, 1997**) (**CH2M HILL, 1997, 1997b, 1997c**). The agencies and Army concurred that the site wide response actions had achieved "construction complete" status and that the remedy was entering the operations and maintenance (O&M) phase.

The Army prepared the first Five-Year Review Report in 2001 to determine whether the remedial actions remain protective of human health and the environment and to assess whether the actions are functioning as designed and are operated and maintained in an appropriate manner. The report concluded that the remedy remained protective of human health and the environment and would remain so through completion (**U.S. Army, 2001**). A few minor deficiencies that do not immediately impact the protectiveness of the remedy were noted in the report. USEPA concurred with the Five-Year Review Report in September 2001. The second Five-Year Review Report is expected to be finalized in 2006.

The extraction system which has operated since 1997 currently includes eight groundwater extraction wells with two of the extraction wells located on site and the others located off site, primarily west of the facility. Four groundwater monitoring events occur throughout the year. Samples are analyzed for dissolved chromium and/or cyanide and groundwater elevation data is collected and reported. Long term groundwater monitoring and cap maintenance is performed at the Landfill Site including annual surveys to assure stability and annual management of a pesticide program to prevent rodent burrow damage.

4.2 Past Actions and Current Status Under RCRA

On July 30, 1995, DTSC issued the RCRA Part B Hazardous Waste Facility Permit for RBAAP. RBAAP currently holds a RCRA Part B Permit 05-SAC-06, I.D. Number (CA7210020759) for a Treatment, Storage and Disposal Facility (TSDF).

In addition to monitoring and reporting requirements for the facility, the RCRA Permit required the Army to conduct a RFI. In June 2002, the Army and DTSC signed a Corrective Action Consent Agreement (CACA) that identified 25 SWMUs and 16 AOCs which are listed below: (**DTSC, 2002**):

Solid Waste Management Units

SWMU 1 – IWTP
SWMU 2 – Hazardous Waste Storage Area (Drum Storage Facility);
SWMU 3 – Empty Drum Storage Area (Railroad Car Off-Loading Area);
SWMU 4 – Drum Staging Area (at the IWTP);
SWMU 5 – Chromium Reduction Unit (Building 13);
SWMU 6 – Chromium Reduction Unit (Building 1);
SWMU 7 – Coolant Recovery Unit (at the IWTP) (Hyde Ultra Filtration Unit);

SWMU 8 – Waste Oil Accumulation Unit (Waste Oil Storage Tank);
SWMU 9 – Equipment Wash Facility (Triple Rinse Area);
SWMU 10 – Landfill (Southern Portion);
SWMU 11 – Landfill (Northern Portion);
SWMU 12 – IWTP Sewer Line Break Area (Effluent Force Main);
SWMU 13 – Incinerator (Building 123);
SWMU 14 – Incinerator (Building 163);
SWMU 15 – Pesticide Storage Area (Building 11);
SWMU 16 – Pesticide Storage Area (Building 165);
SWMU 17 – Pesticide Storage Area (Building 170);
SWMU 18 – Former Sludge Desiccating Pit (Waste Salt Disposal Pit);
SWMU 19 – Waste Zinc-Cyanide Solution Neutralizing Tanks;
SWMU 20 – Northwest Storm Reservoir;
SWMU 21 – Southeast Storm Reservoir;
SWMU 22 – Sanitary Wastewater Settling Ponds;
SWMU 23 – E/P Ponds;
SWMU 24 – Industrial Waste Pipe Leak;
SWMU 25 – Underground Storage Tanks;

Areas of Concern

AOC 1 – Mortar Line Accumulation Area (Building 4)
AOC 2 – Machine Shop Accumulation Area (Building 9)
AOC 3 – Vehicle Maintenance Accumulation Area (Building 15)
AOC 4 – Grenade Line Accumulation Area
AOC 5 – Former Windrowed Area
AOC 6 – Sulfuric Acid Spill Area (1956)
AOC 7 – Phosphoric Acid Spill Area (1978)
AOC 8 – Horizontal Aboveground Storage Tanks
AOC 9 – Vertical Aboveground Storage Tanks
AOC 10 – Former Solid Waste Pile (Southeast Corner)
AOC 11 – Loading Racks
AOC 12 – Industrial Wastewater Collection System
AOC 13 – Draw Lube System (Building 178)
AOC 14 – Zinc-Cyanide Wastewater Collection System
AOC 15 – Building 13 Temporary Wastewater Line
AOC 16 – Substation 5

The CACA specifically described the need for additional investigation to determine the nature and extent of contamination at five RBAAP sites listed below:

- AOC 8B – Transformer Oil Storage Tanks and Distribution System;
- AOC 8B – Transformer Oil Storage Tanks and Distribution System;
- AOC 12 – Industrial Wastewater Collection System;

- AOC 14 – Zinc-Cyanide Wastewater Collection System;
- AOC 16 – Substation 5 and Storm Drain Discharge Basin;
- SWMU 16 – Pesticide Storage Building.

Based on the RFI findings and documented in the 2005 Final RCRA Facility Investigation Report, DTSC approved the findings with a letter of no further action required (**DTSC, 2005**). However, as stipulated by DTSC and specifically addressed in the 1994 ROD, further soil sampling will be required at SWMU 1 (IWTP) in the future as part of the permit closure process.

5.0 PMP PERFORMANCE OBJECTIVES

The objective of this PMP is the preservation of controls put in place to protect human health and the environment at those sites where contamination remains above levels allowable for unrestricted use. These sites include areas encompassing groundwater contamination resulting from the former IWTP operations, the landfill site, SWMU 1 (IWTP) addressed under the existing RCRA Permit and industrial operation areas where contaminants in soil remain above levels allowing for unrestricted use. The sites will remain subject to regulation under RCRA and CERCLA as long as the contaminants present a threat to human health and the environment. The controls described in this document shall be implemented to achieve the following objectives:

- The continued compliance with all terms and conditions of the 1994 ROD under CERCLA and with the requirements of the existing RCRA Permit;
- Insure that activities at a site or future uses remain in compliance with the restrictions outlined in the implementation plan for that site or environmental media;
- Prevent excavation and construction that would compromise the integrity of any protective structures such as the landfill cap or pavement in the vicinity of the IWTP with the exception of Army and agency authorized activities;
- Prohibit the human consumption of groundwater on-site that exceeds Federal Maximum Contaminant Levels (MCLs);
- Provide landowners in the vicinity of the off-post groundwater contamination via Stanislaus County Department of Environmental Resources with annual notifications regarding the status of the cleanup efforts and advised use restrictions;
- Ensure that routine maintenance activities required to ensure the integrity of the landfill cap and groundwater treatment/monitoring are performed, including inspections and maintenance to prevent damage or unauthorized modifications.

6.0 IMPLEMENTATION ACTIONS

The following land use control implementation actions will be undertaken by the Army to ensure that the land use control performance objectives are met and maintained.

6.1 Riverbank Land Use Controls Coordinator

The RBAAP Commander's Representative will identify a Land Use Controls Coordinator (LUCC) for RBAAP. The LUCC shall be responsible for the care and maintenance of all RCRA and CERCLA land use restricted sites on RBAAP. All activities at sites covered by this PMP will be coordinated through and be approved by the LUCC.

6.2 Distribution of Information

The PMP and the Site-Specific implementation plans provided in Appendices A, B, and C shall be provided to the following entities:

- USEPA – Federal Regulatory Agency responsible for enforcement of CERCLA;
- USEPA – Federal Regulatory Agency responsible for enforcement of CERCLA;
- DTSC – State of California DTSC responsible for enforcement of RCRA;
- State of California RWQCB;
- NI Industries: Responsible for maintenance and operation of the plant;
- Local Redevelopment Authority: Body charged with developing a reuse plan supporting the interests of the community prior to BRAC transfer;
- Restoration Advisory Board (if exists in future);
- Local City of Riverbank and Stanislaus County, Department of Environmental Resources.

6.3 Notification

The LUCC shall notify and work with EPA, DTSC, the Regional Water Control Board and the Stanislaus County Department of Environmental Resources if a proposed activity is expected to have an adverse impact on the remedy. Any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the controls will be addressed by the Army as soon as practicable, but in no case will the process be initiated later than 10 days after the Army becomes aware of the breach. Unanticipated or emergency actions that result in a violation of the restrictions placed on a site shall be reported to the agencies listed above no longer than 10 days after discovery. The LUCC will immediately start working to remedy the problems created by the action.

6.4 Reporting

Beginning upon approval of the PMP and continuing until the effective date of property conveyance, the Army will provide to USEPA, DTSC and the RWQCB an annual LUC Compliance Report. Following property conveyance, either the Army or new property owner will continue to provide annual LUC Compliance Reports as will be determined in the terms of the transfer and documented in the deed.

As the basis for the LUC Compliance Report, the LUCC or designee shall inspect the sites to evaluate compliance with required restrictions. The compliance report will be submitted annually as a letter report containing the following information:

- Identification of the site and associated restrictions;
- A summary of the physical site inspections at each site;
- Information on any violations. Should any violation or deficiency be found during a site inspection, the Army will provide a written explanation describing the deficiency and what efforts or measures have or will be undertaken to correct the deficiency;
- Identification any corrective actions found to be necessary as a result of changes in site conditions;
- Any proposed changes to inspection and reporting frequency.

6.5 Future Property Conveyance

Future transfer of the property from the Army will include a CERCLA 120(h)(3) covenant which will contain a description of the residual contamination on the property and the environmental use restrictions, expressly prohibiting activities inconsistent with restrictions placed on the property. As RBAAP will be transferred under BRAC05, a Finding of Suitability to Transfer (FOST) will be prepared and will contain all land use restrictions in the environmental protection provisions section of the FOST. Until the property at this site is transferred, the Army will be responsible for implementation, inspection, periodic reporting, and enforcement of the land use controls (LUCs) for the RBAAP. As a condition of property transfer, the transferee in cooperation with USEPA, DTSC and RWQCB may assume responsibility for various implementation actions. Third party LUC responsibility will be incorporated into pertinent contractual and property documentation. Although the Army may transfer responsibility for various implementation actions to a third party, the Army shall remain ultimately responsible for remedy integrity. This means that the Army remains responsible for addressing violations of LUCs that would impair the CERCLA remedy. Should any LUC deficiency result in failure to maintain remedy integrity, the Army will ensure that appropriate actions are taken as soon as practicable to reestablish the remedy's protectiveness and may initiate legal action to either compel action by a third party(ies) and/or to recover the Army's costs for remedying any discovered LUC violation(s).

7.0 DOCUMENTATION OF RESTRICTIONS

7.1 Signage

Information signs will be upgraded and placed at the landfill site informing people accessing these areas that there are use restrictions. The signs will indicate that the area is subject to land use controls, and will identify the organization to contact regarding questions or concerns.

7.2 Map of LUC Locations

Maps showing the locations of sites with land use controls are provided in each of the implementation plans presented in the appendices. The purpose of the maps are to provide a quick

reference to people involved in planning operations, construction activities and maintenance activities. The maps are expected to be a significant tool in the efforts to control activities on these sites.

8.0 ENFORCEMENT

A site will continue to be subject to regulations under CERCLA or RCRA until such time that it is shown that the remedy is complete or the site conditions no longer represents a threat to human health or the environment.

Should a site be transferred, the Army shall include all existing regulatory restrictions on the transfer deed in the form of restrictive covenants or deed restrictions. The deed provisions will include requirements for the Army or future owner to enforce, maintain, and annually inspect the sites and associated controls.

9.0 TERMINATION OF LAND USE CONTROLS

Land Use Controls will be maintained until the concentration of hazardous substances in the soil and groundwater are at such levels to allow for unrestricted use. The following options are available with regulatory concurrence should the Army or future property owner decide that the land use controls at a site need to be modified:

- A new evaluation of the site. The evaluation may include an evaluation of historical data against current standards. The evaluation could find that contamination levels are below the protective standard values.
- Performance of additional remediation such that use restrictions would no longer be required.

10.0 REFERENCES

Department of Toxic Substances Control. 2002. Corrective Action Consent Agreement, Riverbank Army Ammunition Plant, Stanislaus County.

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FIGURES

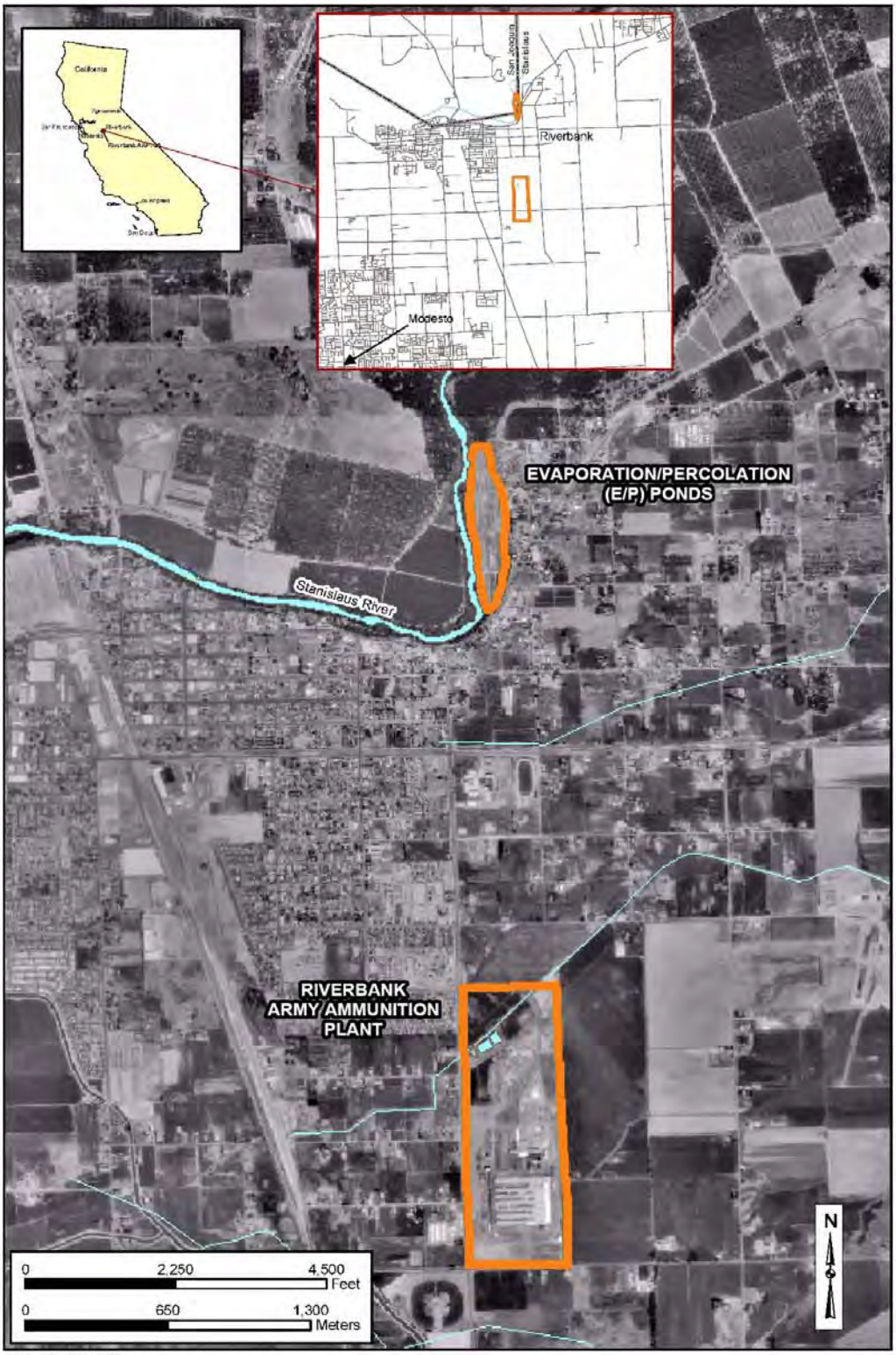

FIGURE-1

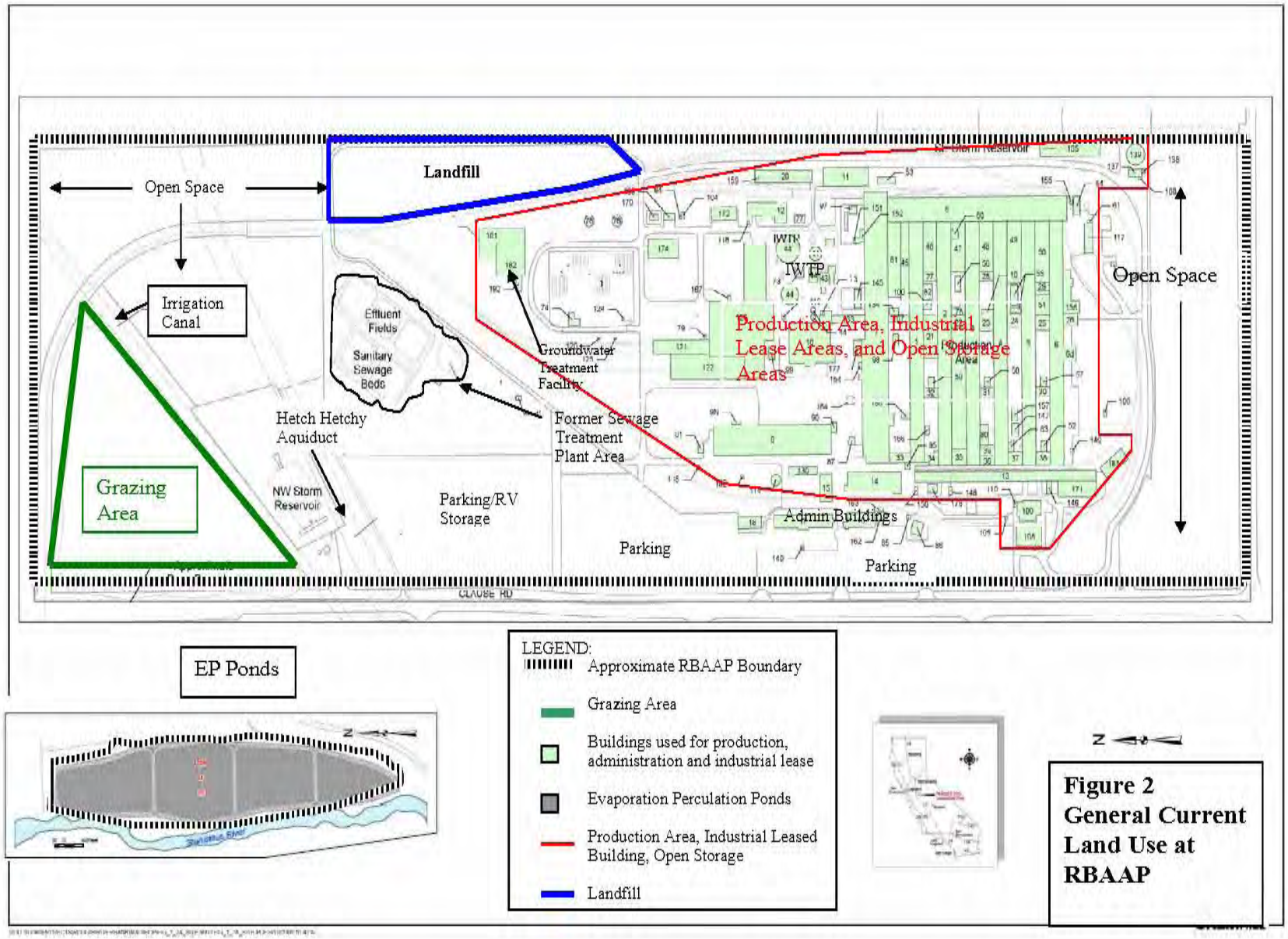

Figure 2
General Current Land Use at RBAAP

U.S. ARMY ENVIRONMENTAL CENTER

APPENDIX A

IMPLEMENTATION PLAN
GROUNDWATER

PROPERTY MANAGEMENT PLAN
FOR LAND USE CONTROL ACTIONS
RIVERBANK ARMY AMMUNITION PLANT

Draft Final
November 2006

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ACRONYMS AND ABBREVIATIONS

BRAC	Base Realignment and Closure
CDHS	California Department of Health Services
DTSC	Department of Toxic Substances Control
DWS	Drinking Water Standard
FOST	Finding of Suitability to Transfer
GWTP	groundwater treatment plant
IWTP	Industrial Wastewater Treatment Plant
MCL	maximum contaminant level
NPL	National Priorities List
NTNC	nontransient, noncommunity
RBAAP	Riverbank Army Ammunition Plant
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SWMU	Solid Waste Management Unit
USEPA	U.S. Environmental Protection Agency

APPENDIX A

IMPLEMENTATION PLAN
GROUNDWATER
RIVERBANK ARMY AMMUNITION PLANT

1.0 REASON FOR LAND USE CONTROLS

Groundwater contamination consisting of chromium and cyanide is present in the aquifer at Riverbank Army Ammunition Plant (RBAAP) at levels exceeding the remediation level State Drinking Water Standard (DWS) maximum contaminant level (MCL) of 50 ppb for chromium and 200 ppb for cyanide. Potential exposures to groundwater through direct ingestion or showering were associated with significant human health risks. Controls are needed to prevent consumption of contaminated groundwater from the shallow (A', A, B, and C) aquifer zones. The protectiveness of the remedy will continue to be evaluated as part of the CERCLA 5-year review process.

2.0 SITE HISTORY

The U.S. Environmental Protection Agency (USEPA) added RBAAP onto the National Priorities List (NPL) on February 21, 1990 primarily due to the presence of groundwater contamination (chromium and cyanide) detected on and off-post. The source of the chromium contamination detected in groundwater was traced to releases associated with the original Industrial Wastewater Treatment Plant (IWTP).

The IWTP at RBAAP was constructed to treat the wastewaters generated from the electroplating, cleaning and metal finishing processes that are operated on-site and includes facilities for flocculation, clarification, sludge thickening, sludge/liquid separation, and nitrate salt removal. The original storage and equalization tanks used for the IWTP were made of redwood which would leak. During periods of low flow to the IWTP the redwood would desiccate, causing gaps between the timbers. Upon filling, fluid would leak through the gaps to the ground until the timbers swelled once again and closed the gaps. From 1973 to 1980 the IWTP was upgraded and the redwood tanks were replaced with concrete tanks. Based on groundwater contamination both on-site and off-site, the IWTP area was identified as a major source of chromium contamination in the groundwater.

Prior to the 1994 ROD, the Army installed an interim groundwater treatment system and provided alternative drinking water sources to all affected off-site residences. In 1992 the Army completed the extension of the Riverbank City water system which connected services to all potentially affected residents located downgradient to the west of RBAAP.

The final site-wide Record of Decision (ROD) signed in March 1994 required expansion of the interim groundwater treatment system to fully capture groundwater contamination. The expanded system began operation in 1997 and is now removing the contaminated

groundwater by means of Ion Exchange. The major requirements of the groundwater remedy described in the 1994 ROD included:

- Groundwater extraction from wells located on-site and off-site, with an estimated minimum extraction rate of 120 gpm (actual extraction and treatment rates were to be determined during remedial design).
- The extraction system needs to capture chromium plumes above 50 ppb [California Department of Health Services (CDHS) MCL] and cyanide plumes above 200 ppb (USEPA MCL). Full plume capture will be demonstrated by an adequate monitoring well network.
- Treatment for chromium and cyanide using chemical reduction/precipitation and ion exchange.

The ROD also described two "post-ROD" potential actions that, although not part of the remedy, might need to be addressed based on future site conditions or findings. These potential actions include:

- Investigation of the IWTP;
- Recharge of the A-zone.

The IWTP remains an active unit treating waste under a Resource Conservation and Recovery Act (RCRA) Part B Permit identified as (Solid Waste Management Unit (SWMU) 1], and the Department of Toxic Substances Control (DTSC) has indicated that additional sampling of soil will be required under each unit at the IWTP when this system goes through permit closure. The second post-ROD action consists of continued monitoring of the A-zone to assess whether it recharges, and if it does recharge, investigation of the extent of contamination. If groundwater cleanup levels are exceeded, the A zone groundwater would then need to be remediated. Groundwater is currently monitored on a quarterly basis as per specifications in the Final Extraction System Design and Monitoring Plan with System Operating Procedures (**CH2MHill, 1997**).

The extraction system which has operated since 1997 includes eight groundwater extraction wells with two of the extraction wells located on-site and the others located off site, primarily west of the facility. It is projected that the system will be operated until the year 2008 but it may require more years of operation beyond 2008 depending on the effectiveness of the extraction system. RBAAP currently has a monitoring well network of 129 wells screened in the various aquifer zones (A', A, B, C and D) defined below:

A - an unsaturated upper sand zone; average depth from 29 to 60 feet bgs (below ground surface);

A'- a partially to fully saturated, well-graded silty sand; average depth from 60 to 90 feet bgs; approximately 30 feet thick;

B - saturated, semi-continuous sand units interbedded with thin silt and clay layers; average depth from 90 to 120 feet bgs; approximately 30 feet thick;

C - saturated sand zone; average depth from 120 to 150 feet bgs; approximately 30 feet thick; and

D - saturated coarse sand and gravel with volcanic material; between 150 and 220 feet bgs; approximately 70 feet thick.

Four groundwater monitoring events occur throughout the year-two quarterly, one semi-annual and one annual which include specific sets of wells completed in the various A', A, B , C and D portions of the aquifer. Samples are analyzed for dissolved chromium and cyanide and groundwater elevation data is collected and reported as specified in the Quality Assurance Project Plan Addendum (**CH2MHill, 1999).** The Army prepared the first Five-Year Review Report in 2001 to determine whether the remedial actions remain protective of human health and the environment and to assess whether the actions are functioning as designed and are operated and maintained in an appropriate manner. The report concluded that the remedy remained protective of human health and the environment and would remain so through completion (**U.S. Army, 2001**).

In general, the contaminated areas are much smaller as of 2006 1st Quarter Sampling Results then they were in 1997 when the system began operation, and significantly smaller than in 2001 when the first five-year review was performed. Historically, the highest concentrations of chromium and cyanide have been observed in the A-zone, at 1,300 and 22,600 µg/L, respectively. Groundwater results are provided on a quarterly basis in Quarterly Monitoring Reports. Based on the most recent 2006 1st Quarter results, cyanide concentrations exceeded the 200 ppb MCL in only one well (MW71A') which is located on RBAAP property. Cyanide concentrations detected off-post in 2006 1st Quarter ranged from 18 to 83 ppb below the 200 ppb MCL. Chromium concentrations exceeded the 50 ppb CDHS MCL in seven wells ranging from 58 to 275 ppb. Only one off-post well (Well 115 A') contained chromium (70.6 ppb) above the CDHS MCL of 50 ppb.

3.0 GROUNDWATER RESTRICTIONS

3.1 On-Site Groundwater Restrictions

The following section addresses restriction of groundwater use or unauthroized alteration/disturbance of the active remediation system and the existing monitoring well network located within the boundaries of the RBAAP property.

3.1.1 Restrictions Under the California Department of Health Drinking Water Program

The consumptive use of contaminated groundwater present in the aquifer zones A, A', B, C or D at RBAAP is prohibited based on the terms of the existing State of California Domestic Water Supply Permit. The area of on-site groundwater use restriction outside

of the terms of the permit includes the entire main plant property as displayed in **Figure A-1**.

The RBAAP currently operates a water system that serves the facility. The system is classified as a nontransient, noncommunity (NTNC) water system that serves the plant property. The system has 26 service connections and obtains its water supply from three active wells located on the plant property listed below:

Potable Supply Wells at RBAAP as per Permit 03-10-03P-005		
Name	**Depth**	**Status**
Well 01	430	Standby
Well 05	710	Active
Well 06	605	Active

The system operates under the State of California Domestic Water Supply Permit 03-10-03P-005 **(State of CA, 2003).** Under the terms of the State of California Water Supply Permit the only sources approved for potable water supply for the facility are wells 01, 05, and 06 which are inspected annually and require quarterly monitoring. Any use of non approved sources of water to include wells not listed on the permit is in violation of permit conditions.

3.1.2 Restrictions on Alteration of Active Remediation System and Monitoring Well Network

The RBAAP maintains an active groundwater treatment plant (GWTP) and associated extraction well and monitoring well network. The GWTP is maintained and operated by the Army in accordance with the requirements documented in the 1994 ROD and updated accordingly with regulatory approval as part of the five year review process.

All monitoring and extraction wells are secured with locks and access to the installation is controlled by fencing and plant security personnel. Significant alterations of this system or application of alternative remediation technology to optimize or accelerate cleanup will require prior approval by USEPA, DTSC and Regional Water Quality Control Board (RWQCB).

No activities or actions that will damage the well heads, vaults, casing, or compromise the overall integrity of monitoring wells shall be allowed on the property. Abandonment of monitoring wells shall be conducted only as approved by USEPA, DTSC and the RWQCB and will be conducted according to State of California well abandonment procedures.

3.2 Off-Site Groundwater

As documented in the 1994 ROD and subsequent Quarterly Monitoring Reports, contamination consisting of chromium and cyanide originating from RBAAP has been documented in groundwater underlying the area immediately to the west of RBAAP. In 1992 the Army completed the extension of the Riverbank City water system which connected services to all potentially affected residents located downgradient to the west of RBAAP. This action involved disconnection of the well to house plumbing and the installaion of backflow preventors. The residents were informed that well water use should be restricted to use for irrigation and other non-potable uses outside the home. As this area falls outside of the Army controlled RBAAP property boundaries, the Army and future property owners must rely on existing Stanislaus County Well Construction Requirements (**See Attachement A-1 and A-2**) and Stanislaus County notification procedures to inform the public and to ensure that existing wells are not used for potable use or new wells are not installed in this area for drinking water purposes prior to completion of groundwater remediation.

3.2.1 Stanislaus County Well Construction Requirements

Based on the existing Stanislaus County Code Title 9, Health and Safety, Chapter 9.36 Water Wells, the installation of wells on the property immediately west of RBAAP is precluded by Stanislaus Well Permit procedures which require the identification of possible sources of contamination in the vicinity of the property. As per Chapter 9.36.030 the owner of property upon which a well is located or proposed to be located, or his authorized representative, shall obtain a permit from the health officer to construct, repair or destroy any well or well seal. No person shall construct, install, repair or destroy any well or well seal without first having been furnished a copy of a valid permit for such work. In addition, A well site and surrounding property may be inspected by the health officer at any time prior to the destruction or construction of any well.

3.2.2 Stanislaus County Annual Notification

Based on Army discussion with the Stanislaus County Department of Environmental Resources, it has been acknowledged that residents located in the area west of RBAAP which have been connected to the City of Riverbank water but have maintained groundwater wells for non-potable use should be provided an annual notification regarding the groundwater cleanup activities at RBAAP and the advised use restrictions on groundwater. A list of the residents and associated wells is provided in **Attachment A-3** and a map showing the location of domestic, monitoring and extraction wells is provided as **Figure A-2**. In order to assist the Department of Environmental Resources, the Army will provide copies of the Quarterly Groundwater Monitoring Reports to the Department and make these reports available to the public in the RBAAP Administrative Record and at the City of Riverbank Public Library. The notification will provide a brief historical description of the cleanup efforts and will inform residents of potential risk associated with ingestion and home use of groundwater.

3.2.3 Reporting

An Annual LUC Compliance Report will be provided as described under the Reporting Section of the PMP . All other required reporting including Quarterly Groundwater Monitoring and system O&M as described in the Final Extraction System Design and Monitoring Plan with System Operating Procedures will continue until remedial goals are met or as approved by the regulatory agencies.

4.0 FUTURE ACTIVITIES ON THE SITE

4.1 On-Site Groundwater

As RBAAP will be transferred under Base Realignment and Closure (BRAC) 05, a Finding of Suitability to Transfer (FOST) will be prepared and will contain all land use restrictions in the environmental protection provisions section of the FOST. The Army will then incorporate these restrictions on the deed in the form of restrictive covenants or deed restrictions. Requirements to maintain the integrity of the existing or future groundwater treatment system and well network and prohibition on the potable use of groundwater outside of the terms of the existing State of California Domestic Water Supply Permit will be specifically addressed in future transfer documents and subsequent deed restrictions. The length of time that the deed prohibition against the extraction and use of groundwater from the (A', A, B and C Aquifer Zones) shall remain in effect depends on the length of time needed to remediate those groundwaters and to obtain the required regulatory approval for such use.

4.2 Off-Site Groundwater

The requirement to provide status of cleanup efforts and Quarterly Groundwater Reports to Stanislaus County Department of Environmental Resources will be listed as a requirement in the environmental provisions section of BRAC transfer documents. As a condition of property transfer, the Army may require the transferee to assume responsibility for providing these Quarterly Reports to Stanislaus County Department of Environmental Resources. In this event the responsibility will be incorporated into pertinent contractual and property documentation at the time of transfer.

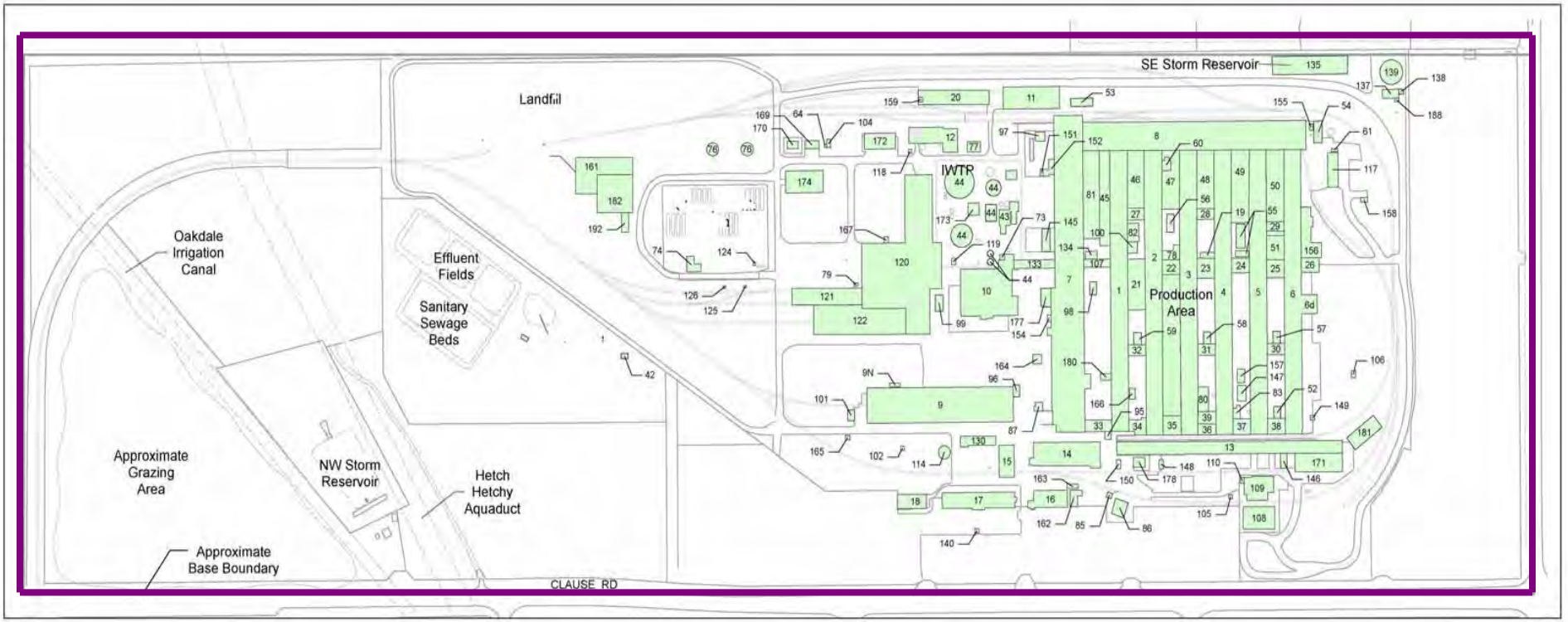
5.0 REFERENCES

CH2MHill, 1999, Quality Assurance Project Plan Addendum, May 1999.

CH2MHill, 1997, Final Extraction System Design and Monitoring Plan with System Operating Procedures , 1997.

State of California. 2003. Domestic Water Supply Permit Issued to Riverbank Army Ammunition Plant. May 14.

U.S. Army. 2001. "First Five-Year Review Report for Riverbank Army Ammunition Plant, City of Riverbank, Stanislaus County, California." February 20.



Legend:

Approximate Facility Boundary defining Area of On-Site Groundwater Use Restriction.

Building

N

FIGURE A-1
Area of On-Site Groundwater Use Restrictions RBAAP

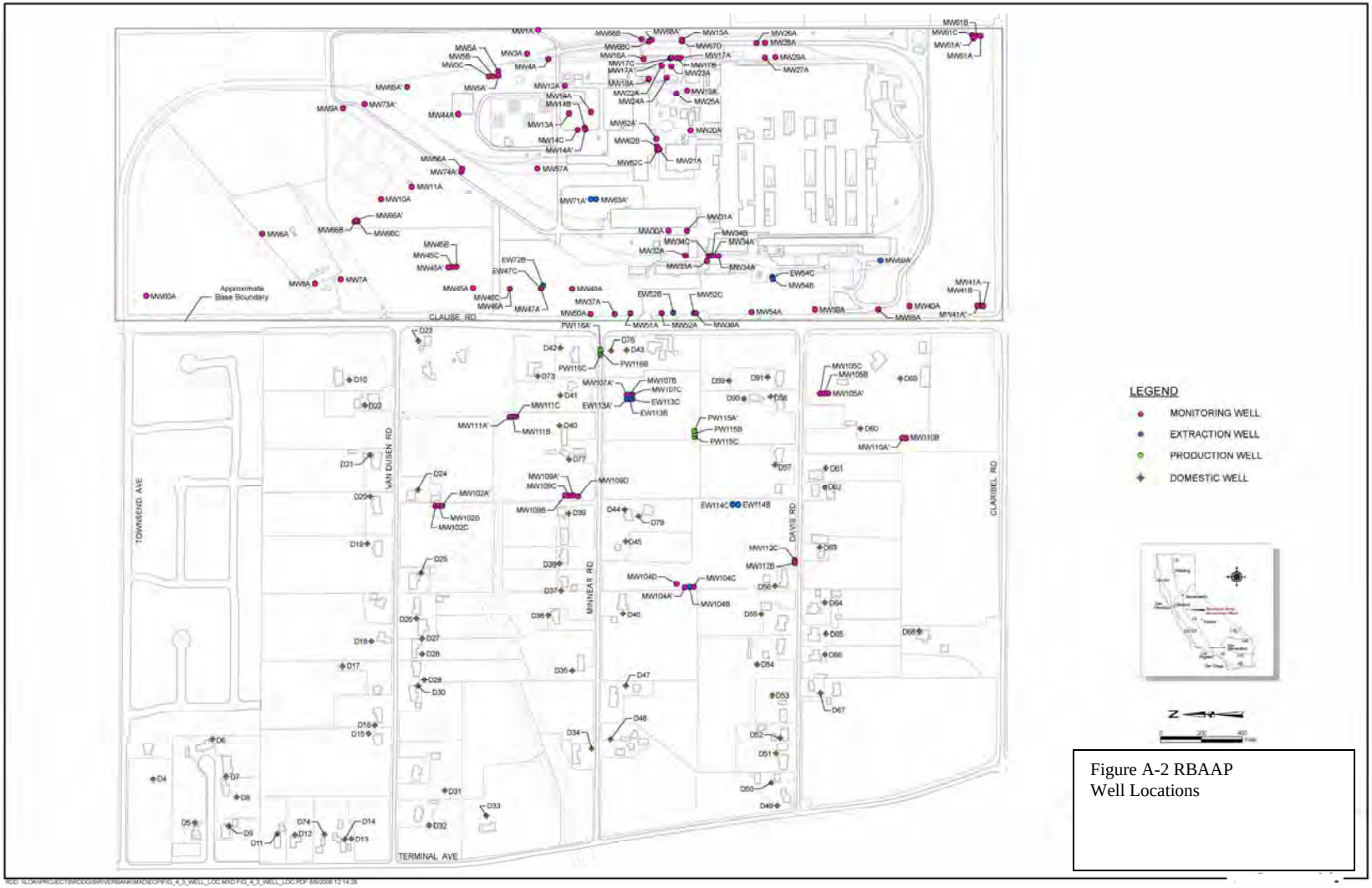


Figure A-2 RBAAP
Well Locations

ATTACHMENTS

Attachment A-1 Applicable Stanislaus County Code

Stanislaus County Code Title 9 Health and Safety
9.36.030 Permit--Required.
The owner of property upon which a well is located or proposed to be located, or his authorized representative, shall obtain a permit from the health officer to construct, repair or destroy any well or well seal. No person shall construct, install, repair or destroy any well or well seal without first having been furnished a copy of a valid permit for such work. A permit shall be required when any well seal is broken. The application for a permit shall be in the form prescribed by the health officer and contain such information as the health officer may require. It shall be a condition of every permit for the repair of a well or well seal that there shall be compliance with the provisions of this chapter. For the purpose of this section, the term "well" includes cathodic protection wells. (Prior code § 3-302).

9.36.020 Definitions.
For the purpose of this chapter, certain words and phrases shall be defined as follows:

A. "Cathodic protection well" means any artificial excavation in excess of fifty feet constructed by any method for the purpose of installing equipment or facilities for the protection electrically of metallic equipment in contact with the ground, commonly referred to as cathodic protection.

B. "Contamination" means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public

Attachment A-2
Stanislaus County Application for Well Construction or Destruction

Lat:_____ Long:_____ **Permit No._____** **T._____R._____Sec._____** **Date Issued:_____** **1/4 Sec._____ Quad._____** **A.P.N._____**	**STANISLAUS COUNTY** **DEPARTMENT OF ENVIRONMENTAL RESOURCES** **3800 CORNUCOPIA WAY, SUITE C,** **MODESTO, CA 95358-9492** **(209) 525-6700**

APPLICATION FOR WELL CONSTRUCTION OR DESTRUCTION

THIS PERMIT EXPIRES 1 YEAR FROM DATE ISSUED

Application is hereby made to the Stanislaus County Department of Environmental Resources (D.E.R.) for a permit to construct and/or destroy the work herein described. PLEASE NOTIFY THIS DEPARTMENT (USING PERMIT # AND D.W.R. WELL DRILLERS REPORT) WHEN WELL WORK IS COMPLETED.

JOB
ADDRESS/LOCATION_____
_____ City_____

Distance & Direction from Nearest Cross Streets
_____
_

Owner's
Name_____
____ Phone_____

Address
_____
City/State_____

Contractor's Name_____
License #_____ Phone_____

TYPE OF WORK:(Check one)

NEW WELL ☐ DEEPEN ☐ RECONDITION ☐ DESTRUCTION ☐

OTHER

☐ _____
_____

DISTANCE TO NEAREST:

SEPTIC TANK _____ SEWER LINES _____ PIT PRIVY_____

OTHER WELL _____ SEWAGE DISPOSAL FIELD _____ SEEPAGE PIT _____

DRY WELL _____ OTHER _____

ANIMAL ENCLOSURE _____

INTENDED USE	**TYPE OF WELL**
☐ Industrial	☐ Cable Tool
☐ Domestic / Private	☐ Drilled
☐ Domestic / Public	☐ Gravel Pack
☐ Irrigation	☐ Rotary
☐ Cathodic protection	☐ Other_____
☐ Other_____	

CONSTRUCTION / DESTRUCTION SPECIFICATIONS

Dia. of Well Excavation _____

Dia. of Well Casing _____

Gauge of Casing _____

Depth Conductor Casing _____

Depth of Grout Seal _____

Type of Grout _____ # Bags_____

Grout Manufacturer_____

Grout Name_____

Well Destruction: Describe method if different than minimum state standards:_____

_____
_____

Existing well present? YES NO **Status:** Active ☐ To Be Destroyed ☐ Inactive ☐

D.E.R. USE ONLY

Permit Issued by:_____Date:_____

Permit Denied by:_____Date:_____(See Attached)

Grout Seal Inspected by:_____Date:_____

Final Inspection by:_____Date:_____

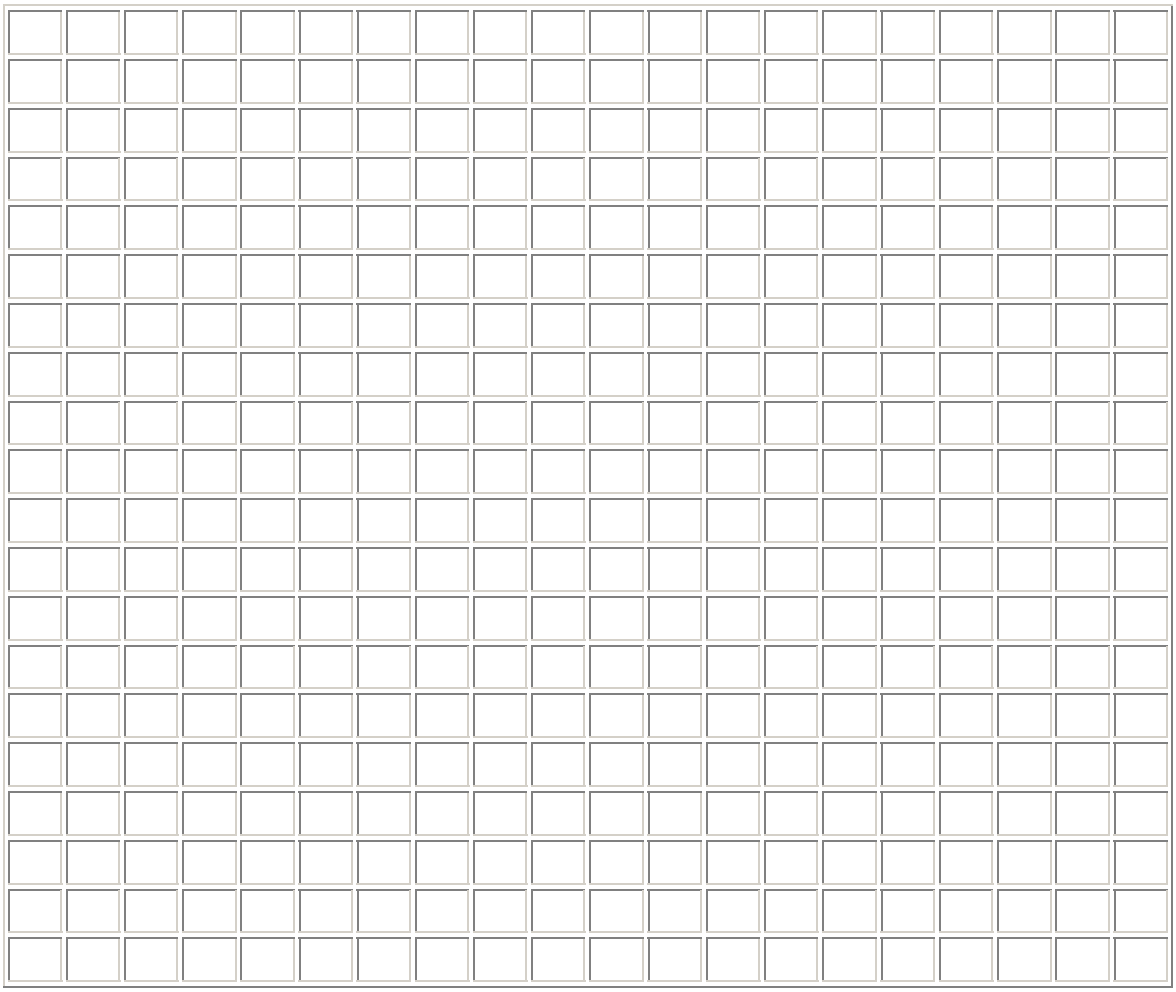
PLOT PLAN

(Indicate Distances in Feet)

1. Name of street and distance from nearest cross roads to well site.

2. Outline of the property, easements.
3. Outlines and locations of all existing and proposed structures, including covered areas such as patios, driveways, and walks.
4. Location of house sewer outlet, public sewer, sewage disposal system, or proposed sewage disposal system, proposed expansion of sewage disposal system, industrial waste pond, or any other possible source of contamination.
5. Location of other wells within radius of 300 feet on the property or adjoining property.
6. Location of sewage disposal system on adjoining property or within a radius of 100 ft. (private well) 150 ft. (public well).

NORTH ^



Written description of well location (if not visible from road):_____

I HEREBY CERTIFY THAT I HAVE PREPARED THIS APPLICATION AND THAT THE WORK WILL BE DONE IN ACCORDANCE WITH THE PROVISIONS OF THE LAWS OF THE STATE OF CALIFORNIA, THE ORDINANCES OF THE COUNTY OF STANISLAUS AND THE RULES AND REGULATIONS OF THE STANISLAUS COUNTY DEPARTMENT OF ENVIRONMENTAL RESOURCES (DER). DER WILL BE CONTACTED FOR INSPECTION OF ANNULAR SEAL INSTALLATION, AND AFTER WELL WORK HAS BEEN COMPLETED.

1. All existing wells within a 300 foot radius of the proposed new well(s) on the property or adjoining property have been located and so indicated.
2. Proposed well(s) will be located at least 50-100 feet from any sewage disposal system on property or adjoining property. Public well requires a distance of 100-150 feet from disposal system (100 ft. septic tank and leach lines, 150 ft. pits).
3. Submit well logs on all public wells drilled, as notice of well work completion.

SIGNED:_____
_____
(OWNER OR AUTHORIZED REPRESENTATIVE)

DATE:_____

Attachment A-3
List of Residential Properties West of RBAAP Connected to Riverbank Public Water Supply

(Note: Domestic Well No. Represents well maintained on property for non-potable use)

Address	Owner (Source: City of Riverbank, May 8, 2006)	Domestic Well No. Ref: Army Well Map
3648 Minniear	Raul Villegas, 1894 Story Rd, San Jose, CA. 95122	D-48
3649 Minniear	Jose & Lucille Lhaslego, 3649 Minniear, Modesto, CA. 95357	D-34
3718 Minniear	John A. Wilson 3718 Minniear, Modesto, CA 95357	D-67
3737 Minniear	Don McAdams C/O Liberty Prop. Mgmt., 1120 Scenic Dr., Modesto, CA	D-35
3767 Minniear	Michael W. Kummer P.O. Box 502, Riverbank, CA 95367	D-36
3772 Minniear	E. Smith 3772 Minniear, Modesto, CA 95357	D-46
3807 Minniear	Francie Chiara 3807 Minniear, Modesto, CA 95357	D-37
3819 Minniear	Lillian Hale 3819 Minniear, Modesto, CA 95357	D-38
3825 Minniear	Muriel Dillon 3825 Minniear, Modesto, CA 95357	D-39
3830 Minniear	TBD	D-45
3848 Minniear	Jack & Glenda Davis 3848 Minniear, Modesto, CA 95357	D-44
3901 Minniear	Lloyd Fannon 3901 Minniear, Modesto, CA 95357	D-77, D-40

Attachment A-3
List of Residential Properties West of RBAAP Connected to Riverbank Public Water Supply

(Note: Domestic Well No. Represents well maintained on property for non-potable use)

Address	Owner (Source: City of Riverbank, May 8, 2006)	Domestic Well No. Ref: Army Well Map
3939 Minniear	Joh Cao 3939 Minniear, Modesto, CA 95357	D-41
3967 Minniear	Charles La Combe 3967 Minniear, Modesto, CA 95357	D-42
5101 Claus Rd	Brite Transport Kirk Lindsey P.O. Box 726, Riverbank, CA 95367	D-69
5337 Claus Rd	Charles V. Clemmens 40 Field Circle, Chambersburg, PA 17201	D-43
5437 Claus Rd	Well Destroyed	D-73 (Well Destroyed)
5537 Claus Rd	TBD	D-23
5643 Claus Rd	Jesse Rogers 5643 Claus Rd, Riverbank, CA 95367	D-10
3607 Davis	Lottie Smink 3607 Davis, Modesto, CA 95357	D-49
3613 Davis	Ken Mattson 3613 Davis, Modesto, CA 95357	D-50
3625 Davis	Elza Youngman 3625 Davis, Modesto, CA 95357	D-51
3643 Davis	Randy Youngman 3643 Davis, Modesto, CA 95357	D-52
3701 Davis	William & Christine McLimans 3701 Davis, Modesto, CA 95357	D-53
3718 Davis	Debbie Parker 3718 Davis, Modesto, CA 95357	D-67

Attachment A-3
List of Residential Properties West of RBAAP Connected to Riverbank Public Water Supply

(Note: Domestic Well No. Represents well maintained on property for non-potable use)

Address	Owner (Source: City of Riverbank, May 8, 2006)	Domestic Well No. Ref: Army Well Map
3731 Davis	Maria Carmen Romo 3731 Davis, Modesto, CA 95357	D-54
3742 Davis	Shawn Phelps 3742 Davis, Modesto, CA 95357	D-66
3754 Davis	Clyde Pritsch 3754 Davis, Modesto, CA 95357	D-65
3766 Davis	Well Destroyed	D-64
3773 Davis	Michael Cabral 3773 Davis, Modesto, CA 95357	D-55
3801 Davis	Tom Tackett 3801 Davis, Modesto, CA 95357	D-56
3812 Davis	Joe Garcia 9595 Lorenzo St, La Grange, CA 95329	D-63
3854 Davis	Joe Garcia 3854 Davis, Modesto, CA 95357	D-62
3866 Davis	Jan Brown 3866 Davis, Modesto, CA 95357	D-61
3912 Davis	Not Using City Water	D-60
3941 Davis	Keith Baker 3941 Davis, Modesto, CA 95357	D-90
3951 Davis	David Ribeiro 3951 Davis, Modesto, CA 95357	D-57
3971 Davis	TBD	D-59
5512 Terminal	Jim Sessums P.O. Box 705, Riverbank, CA 95367	D-33

Attachment A-3
List of Residential Properties West of RBAAP Connected to Riverbank Public Water Supply

(Note: Domestic Well No. Represents well maintained on property for non-potable use)

Address	Owner (Source: City of Riverbank, May 8, 2006)	Domestic Well No. Ref: Army Well Map
5648 Terminal	Robert Wade 5648 Terminal, Riverbank, CA 95367	D-12
5654 Terminal	TBD	D-11
5612 Terminal	TBD	D-13 and D-14
3608 Van Dusen	Kim Reisz 3608 Van Dusen, Riverbnk, CA 95367	D-32
3660 Van Dusen	Michael & Danise Evans 3660 Van Dusen, Riverbank, CA 95367	D-31
3718 Van Dusen	Don Conner 3718 Van Dusen, Riverbank, CA 95367	D-30
3730 Van Dusen	Mike Winget 3730 Van Dusen, Riverbank, CA 95367	D-29
3748 Van Dusen	Juan Venegas 3748 Van Dusen, Riverbank, CA 95367	D-28
3772 Van Dusen	Wayne Walker 3772 Van Dusen, Riverbak, CA 95367	D-26
3773 Van Dusen	Aliel Diez 3773 Van Dusen, Riverbank, CA 95367	D-18
3774 Van Dusen	Ken & Goldie Ferguson 3774 Van Dusen, Riverbank, CA 95367	D-27
3806 Van Dusen	Francisco Vargas 3806 Van Dusen, Riverbank, CA 95367	D-25
3831 Van Dusen	Playa Del Rio LLC P.O. Box 3381, Danville, CA 94526	D-19
3857 Van Dusen	Elias Lopez 3857 Van Dusen, Riverbank, CA 95367	D-20

Attachment A-3
List of Residential Properties West of RBAAP Connected to Riverbank Public Water Supply

(Note: Domestic Well No. Represents well maintained on property for non-potable use)

Address	Owner (Source: City of Riverbank, May 8, 2006)	Domestic Well No. Ref: Army Well Map
3867 Van Dusen	Plaza Del Rio LLC P.O. Box 3381, Danville, CA 94526	D-21
3965 Van Dusen	Plaza Del Rio LLC P.O. Box 3381, Danville, CA 94526	D-22

U.S. ARMY ENVIRONMENTAL CENTER

APPENDIX B

IMPLEMENTATION PLAN
RBAAP-01 LANDFILL

Draft Final
November 2006

TABLE OF CONTENTS

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

BRAC	Base Realignment and Closure
CCR	California Code of Regulations
DTSC	Department of Toxic Substances Control
FOST	Finding of Suitability to Transfer
IP	Implementation Plan
IRP	Installation Restoration Program
LTM	Long Term Monitoring
LUC	Land Use Control
RBAAP	Riverbank Army Ammunition Plant
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facilities Investigation
ROD	Record of Decision
SWCB	State Water Control board
SWMU	Solid Waste Management Unit
USEPA	U.S. Environmental Protection Agency
USAEC	U.S. Army Environmental Center

APPENDIX B

IMPLEMENTATION PLAN
RBAAP-01 LANDFILL
RIVERBANK ARMY AMMUNITION PLANT

1.0 REASON FOR LAND USE CONTROLS

An unspecified volume of landfill waste material may remain at the RBAAP-01 Landfill. The selected landfill remedy as documented in the 1994 Record of Decision (ROD) included the following components: installation of a final cover, cover maintenance for 20 years, access restriction and eventual deed restriction upon transfer. The final cover was constructed in 1995 in accordance with the substantive provisions of California Code of Regulations (CCRs). Maintenance and monitoring activities are programmed to continue until the year 2015 and the protectiveness of the remedy will be evaluated as part of the five-year review process.

2.0 SITE HISTORY

The Riverbank Army Ammunition Plant (RBAAP)-01 Landfill is a closed landfill site located in the northern section of the main plant near the eastern boundary (**See Figure B-1)**. The 4.4 acre landfill site is a narrow triangular-shaped feature adjacent to the east central property boundary. It is bordered on the north and east by a perimeter road and pasture land and by a railroad siding to the west. A perimeter drainage ditch routes stormwater from north to south. The landfill site response action was identified in the 1994 ROD and called for installation of a final cover and cover maintenance for 20 years. Following the 1994 ROD the landfill site was identified in the 2002 Resource Conservation and Recovery Act (RCRA) Corrective Action Consent Agreement as Solid Waste Management Units (SWMUs) 10 and 11. Although the landfill site was identified as SWMUs, the site had already been addressed under the Army's Installation Restoration Program (IRP) as documented in the 1994 ROD. Based on the actions taken in accordance with the ROD, the Department of Toxic Substances Control (DTSC) concurred with the Army's position that no further action was required for this site under the RCRA Facilities Investigation (RFI) efforts.

Although the term "landfill" has been used to describe RBAAP-01, the entire area was not used for disposal activities and the disposal operations did not involve typical landfill operations, but rather consisted to two discrete disposal trenches and a surface disturbance area. Thus, the entire 4.4-acre area does not represent former debris burial areas but as documented in the 1994 ROD and for the purpose of this Implementation Plan (IP) the entire 4.4-acre area is referred to as the landfill site.

Apparently, during the 15 months of operation by ALCOA (1943-1944) general refuse, including pot liner material (a by-product of aluminum production) were placed in the southern end of the landfill. Although ALCOA was only in operation for a short time,

the aluminum reduction process employed at that time typically generated large volumes of cyanide waste. The pot-liner material is a listed RCRA hazardous waste, with a corresponding listing number of K088. This material is thought to be the source of cyanide contamination from the landfill. After the plant was converted to a cartridge and projectile manufacturing operation by the Army in 1952, the landfill area was reportedly used for incineration and disposal of a variety of industrial sludges and solid waste, including paper, dunnage, oils, greases, solvents, hospital wastes, and construction debris. Burning of the combustible wastes was performed routinely. In 1966, on-site disposal operations were discontinued and the burning pits and disposal trenches were filled with construction rubble and soil. There was no documented disposal in this area after that time. However, review of a 1967 aerial photograph noted a new trench in the central portion of the landfill.

Wells placed down-gradient of the landfill have indicated that the landfill was a possible source of cyanide and chromium contamination in groundwater. Cyanide contamination has been linked to pot liner from aluminum reduction processes, a RCRA listed waste, and has been found in the southern portion of the landfill. Most of the pot liner was removed during previous rubble removal efforts. Chromium contamination has been traced to construction rubble which contained chromium contaminated bricks. These were also removed from the site during a 1987 rubble cleanup effort.

The landfill response action described in the 1994 ROD called for installation of a final cover and cover maintenance for 20 years. The final cover was constructed in accordance with the substantive provisions of CCR, Title 23, Chapter 15, Articles 5 and 8, Corrective Action and Closure Requirements. The landfill cover requirements outlined in the ROD included:

- A foundation soil layer of sufficient stability to be provided by grading and compacting existing landfill soils.
- A 1-foot-thick clay layer with a design permeability of 1×10^{-6} centimeters per second.
- A minimum of 1 foot of clean topsoil to be placed over the clay layer to provide an adequate rooting depth for vegetative cover and to protect the clay layer.
- Grading to provide a minimum of 2% slope to minimize ponding of precipitation and allow for adequate drainage.
- The final cover should be designed with the objective of minimizing maintenance.

Two additional monitoring wells were also required downgradient of the landfill which are sampled quarterly as part of the monitoring requirement for site RBAAP-003.

Implementation of the landfill remedial action began in June 1995 and initial work was completed in October 1995. Additional seeding was performed in 1996 and the final construction was complete on October 3, 1996. The final landfill cover included, from

top to bottom, a 2-foot-thick vegetative cover layer, a 0.25-inch-thick geosynthetic liner, and a 2-foot-thick foundation layer. The landfill cap was designed and constructed to drain rainfall off of and away from the landfill. After installation of the cap and associated drainage and final grading, the cover was hydro-seeded with native grass. As part of the first five-year review some damage was caused in 1997 by construction activity on the adjoining railroad tracks. This was noted in the first five-year review and repairs were made. The second five-year review will be completed in 2006.

3.0 LAND USE/INSTITUTIONAL CONTROLS FOR THE SITE

The institutional controls required to ensure the integrity of the 1994 ROD selected remedy and to prevent unauthorized exposure to materials potentially remaining in the landfill include the following:

3.1 Signage

Signs will be placed and maintained at each corner of the landfill to inform people that this site is the location of a former landfill. The signs provide the following information:

- Name of the Site (RBAAP-01)
- Type of site (Closed Landfill)
- Warning (No digging or excavation without approval)
- Point of Contact [Land Use Control (LUC) Coordinator and Phone Number]

3.2 Access Control

Access to the RBAAP including the Landfill Site is currently controlled by fencing and security personnel.

3.3 Land Use

Land Use: The site is currently maintained as non irrigated open space and will remain as non irrigated open space while under the ownership of the Army. Based on the 1994 ROD, deed restrictions will be placed on the landfill at the time of transfer as a means of maintaining the integrity of the cover through continued LTM and to restrict future use of the landfill site throughout the duration of the 20 year period of LTM .

3.4 Soil Management/Excavation Restrictions

- Excavation restrictions: No activities that will disturb the landfill cap shall be allowed on the property without prior approval of U.S. Environmental Protection

Agency (USEPA), DTSC and the State Water Control Board (SWCB). The LUC Coordinator will work with all utilities and maintenance activities to help insure that utility work does not damage the cover. By working with these activities it is expected that all future utility work will be outside the landfill boundaries.

- The USEPA, DTSC and the SWCB will be notified and coordination activities started in the event that the landfill cover might be breached. This coordination will start in the planning stage when it is known that the utility must be placed in the area. The EPA will also be notified if any excavation around the area encounters areas containing landfill wastes.
- Soil Management: In the event that excavation must take place in the landfill for the purpose of utility placement or other maintenance activities, a Soil Management Plan and Health and Safety plan will be developed and submitted to USEPA, DTSC and the SWCB for approval. Any soil removed from the property shall be sampled and managed in accordance with all applicable provisions of state and federal law.

4.0 CONTINUED MAINTENANCE IN ACCORDANCE WITH 1994 ROD

The objective of final cover monitoring is to ensure that the final cover continues to perform as a barrier to the percolation of water to the waste below. Maintenance requirements for the landfill site are conducted as specified in the "Riverbank Army Ammunition Plant Landfill-Revised Closure/Post Closure Maintenance Plan (**CH2MHill, 1996**) and Final Record of Decision (**USAEC, 1994**). As outlined in the Closure and Post Closure Maintenance Plan, the cover soil and vegetative cover are visually inspected reported on a quarterly basis. In addition to the Quarterly Reports an Annual Landfill Inspection Report is also generated. The quarterly visual inspections cover vegetative growth monitoring, erosion monitoring, and settlement and grading monitoring. In addition annual management of a pesticide program is conducted to prevent rodent burrow damage to the completed landfill cap.

Maintenance and monitoring activities are programmed to continue until the year 2014 and the protectiveness of the remedy will be evaluated as part of the annual LUC Compliance Inspection and Reporting and in subsequent five-year reviews.

5.0 REPORTING

The findings of the Annual Landfill Inspection Report which summarizes the quarterly inspections of this site will serve as the basis for the annual LUC Compliance Report. The Annual Inspection Report will be referenced in the LUC Compliance Report and will serve as the inspection of the site. Any additional information not covered in the Annual Landfill Inspection Report will be included in the Annual LUC Compliance Report.

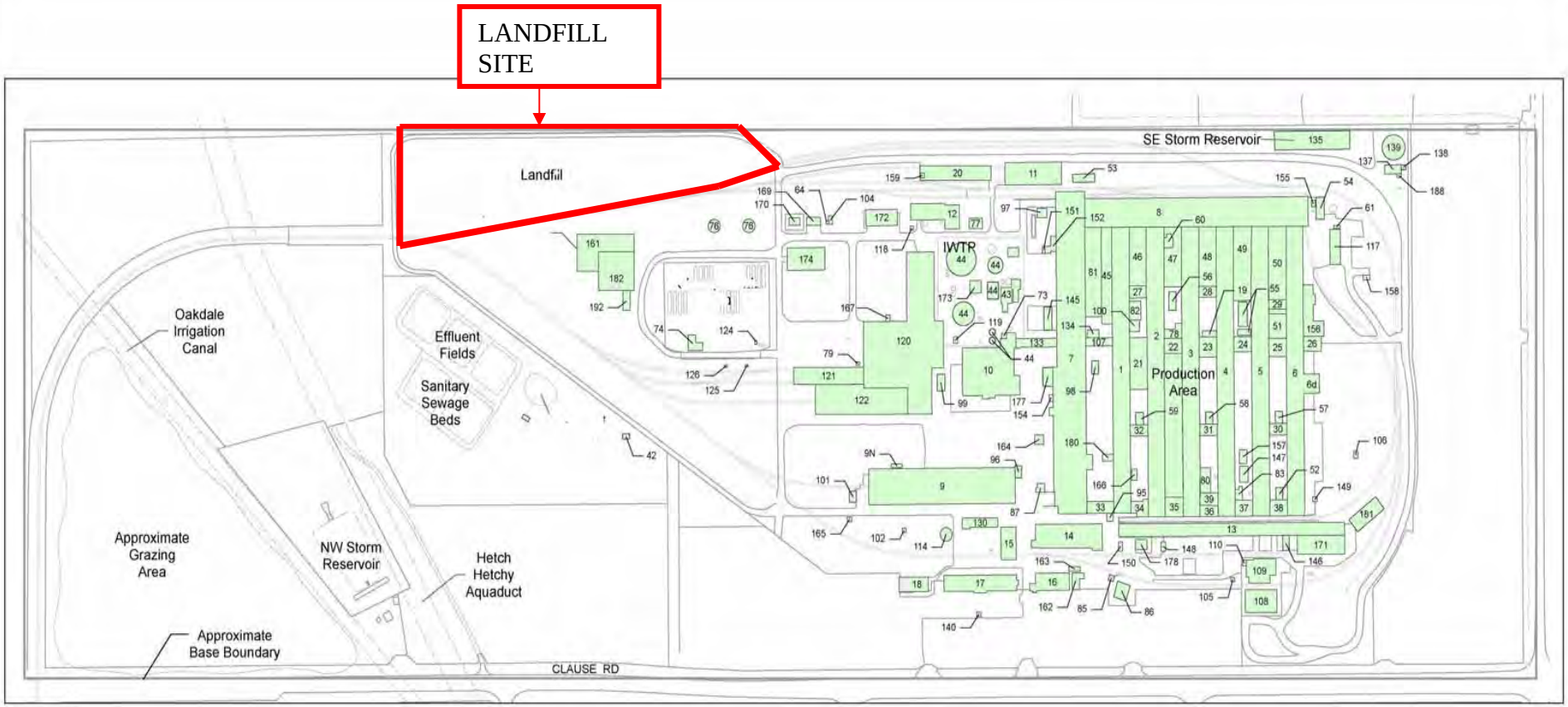
6.0 FUTURE ACTIVITIES ON THE SITE

The site has been maintained as non-irrigated open space. Based on the 1994 ROD, deed restrictions will be placed on the landfill at the time of transfer as a means of maintaining the integrity of the cover through continued LTM and to restrict future use of the landfill site throughout the duration of the 20 year period of LTM. As RBAAP will be transferred under Base Realignment and Closure (BRAC)05, a Finding of Suitability to Transfer (FOST) will be prepared and will contain all land use restrictions in the environmental protection provisions section of the FOST. The Army will then incorporate these restrictions on the deed in the form of restrictive covenants or deed restrictions.

7.0 REFERENCES

CH2MHill, 1996, Riverbank Army Ammunition Plant Landfill Closure-Revised Closure/Post Closure Maintenance Plan, May 1996

U.S. Army Environmental Center (USAEC), 1994 Record of Decision, Riverbank Army Ammunition Plant.



Legend:

Approximate Boundary of the Landfill Site (IRP: RBAAP-001) Defining Area Subject to Land Use Controls

Buildings

FIGURE B-1
RBAAP Landfill Site Subject to Land Use Restrictions

U.S. ARMY ENVIRONMENTAL CENTER

APPENDIX C

IMPLEMENTATION PLAN
SUBSURFACE SOILS AT SWMU-1
INDUSTRIAL WASTEWATER TREATMENT PLANT

Draft Final
November 2006

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
BRAC	Base Realignment and Closure
DTSC	Department of Toxic Substances Control
FOST	Finding of Suitability to Transfer
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant
LUC	Land Use Control
mg/kg	milligram per kilogram
RBAAP	Riverbank Army Ammunition Plant
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SWCB	State Water Control Board
SWMU	Solid Waste Management Unit
USAEC	U.S. Army Environmental Center
USEPA	U.S. Environmental Protection Agency

APPENDIX C

IMPLEMENTATION PLAN
SUBSURFACE SOILS AT SWMU-1
INDUSTRIAL WASTEWATER TREATMENT PLANT
RIVERBANK ARMY AMMUNITION PLANT

1.0 REASON FOR LAND USE CONTROLS

Although not confirmed during the remedial investigation (RI) sampling, there is the potential for soil contamination to be present beneath the Industrial Wastewater Treatment Plant (IWTP) [Solid Waste Management Unit (SWMU) 1]. The IWTP remains an active unit under Part B Permit 05-SAC-06, I.D. Number (CA7210020759) treating waste generated by Army operations at Riverbank Army Ammunition Plant (RBAAP). Department of Toxic Substances Control (DTSC) (in a letter dated July 27, 1998) states that additional characterization of soil at the IWTP is precluded by existing equipment and that additional soil samples should be collected under each IWTP unit when the IWTP is closed as a hazardous waste management unit under RCRA (DTSC, 1997). Further action is deferred until IWTP closure under the terms of the Permit and Modification No. 1 Part VIII-Corrective Action.

2.0 SITE HISTORY

The IWTP is a treatment facility for industrial wastewater generated at the facility from electroplating, cleaning, and metal finishing processes. The primary treatment technologies are coagulation, flocculation and clarification. The IWTP is located to the immediate north of the Production Plant at the facility (**See Figure C-1**).

The IWTP is a system of tanks, sumps, filters, pipes, and other related equipment set up for treating facility wastewater. The IWTP is designed to treat facility wastewater, and includes facilities for coagulation, flocculation, clarification, sludge thickening, and sludge/liquid separation. Treated effluent water is discharged to the facility evaporation/percolation ponds.

The IWTP was originally built after the Army acquired the facility in 1951 and a decision was made to convert the plant to a steel cartridge case manufacturing facility. The configuration of the IWTP had remained nearly unchanged from the start-up in 1952 until about 1972. It consisted of equalization tanks, constructed of redwood, and a pH adjustment system.

During 1952 to 1954, Production Lines 5 and 6 produced zinc-plated shells for the Navy. Because the zinc was electroplated from a cyanide solution, a separate system was required to treat waste from this area. The system consisted of various underground pipes that once conveyed cyanide wastewater to a separate treatment unit at the IWTP. The Cyanide Wastewater Collection System designated as are of concern (AOC)-14 is located primarily along the west side of the Production Plant and consists of

approximately 1,400 to 1,500 feet of 4-inch to 6-inch diameter iron or vitrified clay pipe. This system apparently operated from 1954 to 1958. Use was discontinued due to production capability change. The Cyanide Wastewater Collection System has been disconnected from the Production Plant and the collection sumps filled with concrete in the late 1990s.

In addition to the Cyanide Wastewater Collection System there were additional underground conveyance lines to the IWTP referred to as the Industrial Wastewater Collection System identified as AOC-12. This system of underground piping and waste sumps historically collected industrial wastewater from the Production Plant and transferred it to the IWTP. The Industrial Wastewater Collection System is routed throughout the production area and gravity fed the collected wastewater to the IWTP. The system consists of an estimated 3,500 to 4,000 linear feet of vitrified clay and cast iron pipe ranging from 4 inches to 21 inches in diameter. The sumps that were historically connected to the system (all have now been filled with concrete) were constructed of brick or concrete.

Since 1972, numerous upgrades and improvements have been implemented at the IWTP. The redwood equalization tanks were replaced with a concrete equalization basin in 1980. Reportedly, when the water level in the redwood tanks was reduced for a period, the upper portion of the redwood tanks would dry out and the seams would open slightly. When the liquid level was later raised, the upper portion of the redwood tanks would leak and spill onto the adjacent ground, which was not paved at the time. This is believed to be the source of the chromium and cyanide contamination in the IWTP area.

The entire IWTP area is now covered with impermeable concrete or asphalt layer. A series of concrete drainage trenches captures spills and overflows and drains to the former influent sump which is currently used as a secondary containment sump for the IWTP.

Wastes associated with IWTP include industrial wastewater from the production plant. Wastewater associated with the production plant has historically come from the production lines used to make ammunition casings, such as electroplating, cleaning, and metal finishing processes. Typical wastewater constituents included cyanide, chromium, trace metals, and caustic solutions. Prior to 1978, hexavalent chromium wastes from the zinc chromate solution on the production lines did not receive special treatment. However, in 1978 a chromium reduction pretreatment system was installed. The primary treatment process has been upgraded to lime coagulation.

As part of the RI effort at RBAAP, the IWTP area was characterized to determine the extent of groundwater contamination and to characterize any potential soil contamination in the area. Because the IWTP was operational, investigations were limited to the perimeter of the tanks and did not evaluate soils directly below the tanks. The results of the investigation indicated elevated chromium contamination in groundwater but the results of soil sampling (5 borings, max depth 50 feet below ground surface) showed only low levels of chromium (.34 – 34.3 mg/kg) in 3 of 29 samples and cyanide was detected

in only four soil samples at concentrations of 1.3 to 4.20 mg/kg (**Weston, 1991**). In March 1994, the U.S. Environmental Protection Agency (USEPA), DTSC, Regional Water Quality Control Board (RWQCB), and the Army signed the Record of Decision (ROD) for the RBAAP (**USAEC, 1994**). The site wide ROD contained two response actions; a groundwater response action [Installation Restoration Program (IRP) Site RBAAP-003], and; a landfill response action (IRP Site RBAAP-001) and Post-ROD investigation action at the IWTP upon closure in accordance with RCRA closure requirements.

3.0 LAND USE/INSTITUTIONAL CONTROLS FOR THE SITE

3.1 Access Control

Access to the RBAAP including the IWTP is currently controlled by fencing and security personnel. All visitors are escorted at RBAAP.

3.2 Part B Permit 05-SAC-06, I.D. Number (CA7210020759)

The permit and terms of the permit are the primary controls placed on this site. The IWTP is an active unit and is operated and will continue to be operated in accordance with the terms of the RCRA Permit.

3.3 Soil Management/Excavation Restrictions

- Excavation Restrictions: No excavation activities within the area of the footprint of the IWTP shall be allowed on the property without prior approval of USEPA, DTSC and the State Water Control Board (SWCB). The Land Use Control (LUC) Coordinator will work with all utilities and maintenance activities to help insure that potential utility work will be outside the IWTP boundary.
- The USEPA, DTSC and the SWCB will be notified and coordination activities started in the event that excavation is planned in the area of the IWTP. This coordination will start in the planning stage when it is known that the subsurface utility or maintenance activity must be placed or conducted at the site.
- Soil Management: In the event that excavation must take place at the site for the purpose of investigation, utility placement or other maintenance activities, a Soil Management Plan and Health and Safety plan will be developed and submitted to USEPA, DTSC and the SWCB for approval. Any soil removed from the property shall be sampled and managed in accordance with all applicable provisions of state and federal law.

4.0 REPORTING

Under the terms of the RCRA Permit, Annual Reports are submitted to DTSC. The Annual RCRA Report will be referenced in the LUC Compliance Report and will serve

as the inspection of the site. Any additional information not covered in the Annual Report will be included in the Annual LUC Compliance Report.

5.0 FUTURE ACTIVITIES ON THE SITE

The site has been used for industrial operations related to wastewater treatment since its inception in 1952. As long as the RCRA permit remains active, the site will be maintained for industrial use. Upon closure the IWTP will undergo corrective actions as specified in Part VIII of the permit modification No. 1 dated June 2003. As stated in the permit the future use of the IWTP area will be restricted under California Code of Regulations., Title 22, Chapter 14, Article 7. As RBAAP will be transferred under Base Realignment and Closure (BRAC)05, a Finding of Suitability to Transfer (FOST) will be prepared and will contain all land use restrictions in the environmental protection provisions section of the FOST. The Army will then incorporate these restrictions on the deed in the form of restrictive covenants or deed restrictions.

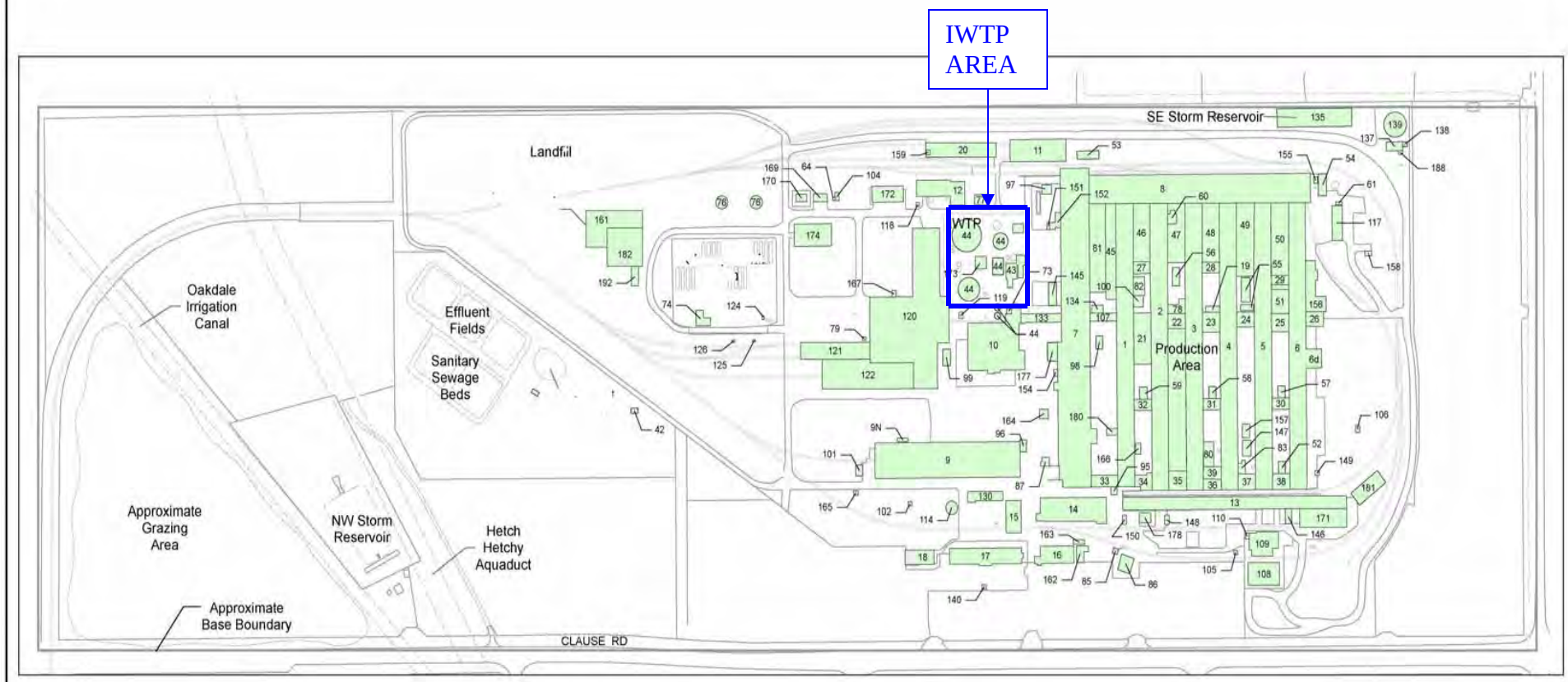
6.0 REFERENCES

Department of Toxic Substances Control, 2006, Hazardous Waste Facility Permit, May 6, 2006.

Department of Toxic Substances Control, 1998, Correspondence from DTSC to RBAAP, RCRA RFI Workplan, July 27,1998.

Roy F. Weston, Inc. [Weston], 1991. Riverbank Army Ammunition Plant Remedial Investigation Report. West Chester, Pennsylvania. Prepared for Commander, U.S. Army Toxic and Hazardous Materials Agency, Aberdeen Proving Ground, Maryland 21010-5401.

U.S. Army Environmental Center (USAEC), 1994 Record of Decision, Riverbank Army Ammunition Plant.



Legend:

Approximate Boundary of the IWTP Site (SWMU-1) Defining Area Subject to ROD contingency and RCRA Part B Permit

Buildings

FIGURE C-1
RBAAP IWTP Site Subject to RCRA Part B Permit

U.S. ARMY ENVIRONMENTAL CENTER

APPENDIX D

IMPLEMENTATION PLAN
GENERAL PRODUCTION / OPERATION AREAS and EP PONDS
AT RBAAP

Draft Final
November 2006

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ACRONYMS AND ABBREVIATIONS

BRAC	Base Realignment and Closure
DTSC	Department of Toxic Substances Control
DWS	Drinking Water Standard
FOST	Finding of Suitability to Transfer
GWTP	groundwater treatment plant
IWTP	Industrial Wastewater Treatment Plant
NPL	National Priorities List
RBAAP	Riverbank Army Ammunition Plant
RCRA	Resource Conservation and Recovery Act
ROD	Record of Decision
RWQCB	Regional Water Quality Control Board
SWMU	Solid Waste Management Unit
USEPA	U.S. Environmental Protection Agency

APPENDIX D

IMPLEMENTATION PLAN
GENERAL PRODUCTION AND OPERATION AREAS AND EP PONDS
RIVERBANK ARMY AMMUNITION PLANT

1.0 REASON FOR LAND USE CONTROLS

Based on environmental investigations conducted at RBAAP, and the historical industrial use of the site there remain contaminants in the soils and groundwater at levels above those allowable for unrestricted use. Due to the historical use of the property and the general assumption of continued DoD industrial operations, most of the previous studies and cleanup efforts related to soils at the site utilized industrial based cleanup goals or EPA Region 9 industrial preliminary remediation goals (IPRGs) for soils in industrial areas for data comparisons (EPA, 2004). As a result the cleanup efforts related to soils were not conducted to allow for unrestricted use. Institutional controls related to groundwater, the Landfill site and the IWTP Site which fall within the area identified as the Production/Operation area are presented in Appendicies A through C of this PMP.

Since the EP Ponds continue to be used for discharge of treated water from the GWTS and IWTP this function requires that the EP Pond area remain restricted for industrial use until the use of the ponds for discharge ceases.

2.0 SITE HISTORY

The area addressed under this implementation plan consists of those areas at RBAAP not specifically addressed in the other implementation plans included in this PMP and which fall into the category of areas of the facility which were historically used for DoD industrial production and operations. The area defined as the General Production and Operation Areas and the EP Pond is displayed on **Figure D-1.** It should be noted that the area defined on **Figure D-1** as subject to institutional controls does not include the area to the north which has historically been maintained as open space and is currently used for grazing.

In general the production and industrial history of the site which went through several changes can be described by the following time sequence of operations:

1942-1944: RBAAP was constructed in 1942 by the Aluminum Company of America (ALCOA) as an aluminum reduction plant supplying military requirements. The plant was built under the authority of the Defense Plant Corporation. RBAAP started production on May 18, 1943. The plant was designed to produce 40,000 tons of aluminum per year. The plant was closed by order of the War Production Board on August 7, 1944 due to the reduced need for aluminum by the military in World War II.

1944- 1951: After closure of the plant in 1944, the facilities were used for the storage of a variety of government surplus materials, including corn and grain.

1951 – 1958: In 1951 the Army gained control of the plant to manufacture steel cartridge cases for joint use by the Army and Navy. The Norris Thermador Corporation (now NI Industries) was awarded the contract for conversion and operation of the plant. Manufacturing Lines 1, 2, 3 and 4 produced 105 millimeter (mm) cartridge cases; Lines 5 and 6 produced the 3-inch/59, 5-inch/38 and 5-inch/54 naval cartridge cases; and Line 7 supplied additional quantities of 105 mm cases.

1958-1966: Plant was placed on a layaway status.

1966- 1976: Reactivated during Vietnam Conflict. Plant produced 105 mm cartridge cases, and 60 mm and 81 mm mortar projectiles. Plant activities during the remainder of 1975 and through 1976 were limited to modernization and expansion of Line 1, layaway of idle facilities, limited manufacturing methods and technology, and maintenance and protection of the overall plant.

1977 through 1990: Only grenade and mortar production lines were operational and the grenade production was ceased in June 1990.

1990 to 2006 : RBAAP activities are limited to the operation of the mortar production line, layaway of idle facilities, limited manufacturing and technology updates, and maintenance and protection of the overall facility. In addition, various buildings at the facility have been leased out to private businesses that conduct a variety of light to heavy industrial activities. RBAAP was placed on the Base Closure List in 2005 and has been slated for closure.

EP Ponds Background: The EP Ponds are identified as SWMU-23 in the June 2002 Corrective Action Consent Order (DTSC, 2002). The unlined ponds were constructed in 1952 for the disposal of treated industrial wastewater generated at RBAAP and continue to be used for that purpose. The four ponds are on land owned by the U.S. Army adjacent to the Stanislaus River. The ponds are operated independently based upon the volume of effluent flow. A sediment removal action was completed in 1993 to address elevated zinc in sediments. The EP Ponds were determined to require no further remedial action in the 1994 ROD but undergo quarterly groundwater monitoring as specified in the Waste Discharge Requirements Order No. 5-01-200.

3.0 LAND USE/INSTITUTIONAL CONTROLS FOR THE SITE

The institutional controls required to prevent unauthorized exposure to materials potentially remaining in soils at the Production and Operation Areas of the facility are listed in the following sections.

3.1 Access Control

Access to the RBAAP facility is currently controlled by locked fencing and security personnel as required by the current DoD mission. The EP Ponds access road is controlled by a locked gate but this area is not completely surrounded by fencing.

3.2 Land Use Restrictions

The area defined as the General Production and Operation Areas at RBAAP is currently used and maintained for DoD production and for leased industrial use. This area will continue to be maintained for industrial use while under the ownership of the Army. Deed restrictions will be placed on the General Production and Operation Area at the time of transfer to restrict future land use to similar use or industrial to ensure protection of public health and the environment. The deed restrictions would prohibit uses of the area for purposes inconsistent with the industrial cleanup standards used.

The area defined as the EP Ponds is currently used as a discharge basin for treated water from the GWTP and IWTP at RBAAP. The ponds receive water from RBAAP via a 3.4 mile underground pipe. Discharge to the ponds is conducted in accordance with the Regional Water Quality Control Board Waste Discharge Requirements Order No. 5-01-200 and RCRA Part B Permit SWMU-23 **(RWQCB, 2001, DTSC, 2006)**. The EP ponds will continue to be maintained for this purpose until the Permit is closed. At the time of Permit closure the EP Ponds will be subject to RCRA Permit closure requirements determined to be necessary by DTSC.

3.3 Restriction on Alteration of Monitoring Well Network at the EP Ponds

The RBAAP maintains a monitoring well network at the EP Ponds site in accordance with the requirements of the Waste Discharge Requirements Order No. 5-01-200. Currently the network consists of 5 monitoring wells which are locked and maintained by RBAAP. No activities or actions that will damage the well heads, vaults, casing or compromise the overall integrity of monitoring wells shall be allowed. Abandonment of monitoring wells shall be conducted only as approved by USEPA, DTSC and the RWQCB and will be conducted according to State of California well abandonment procedures.

4.0 REPORTING

The LUC Compliance Report will include a description of land use activities on the site. Notification procedures outlined in Section 6.3 of this PMP will be followed to report any activities inconsistent with LUC objectives or use restrictions.

5.0 FUTURE ACTIVITIES ON THE SITE

The site has been maintained for DoD industrial and leased industrial space. As RBAAP will be transferred under Base Realignment and Closure (BRAC) 05, a Finding of Suitability to Transfer (FOST) will be prepared and will contain all land use restrictions in the environmental protection provisions section of the FOST. The Army will then incorporate these restrictions on the deed in the form of restrictive covenants or deed restrictions.

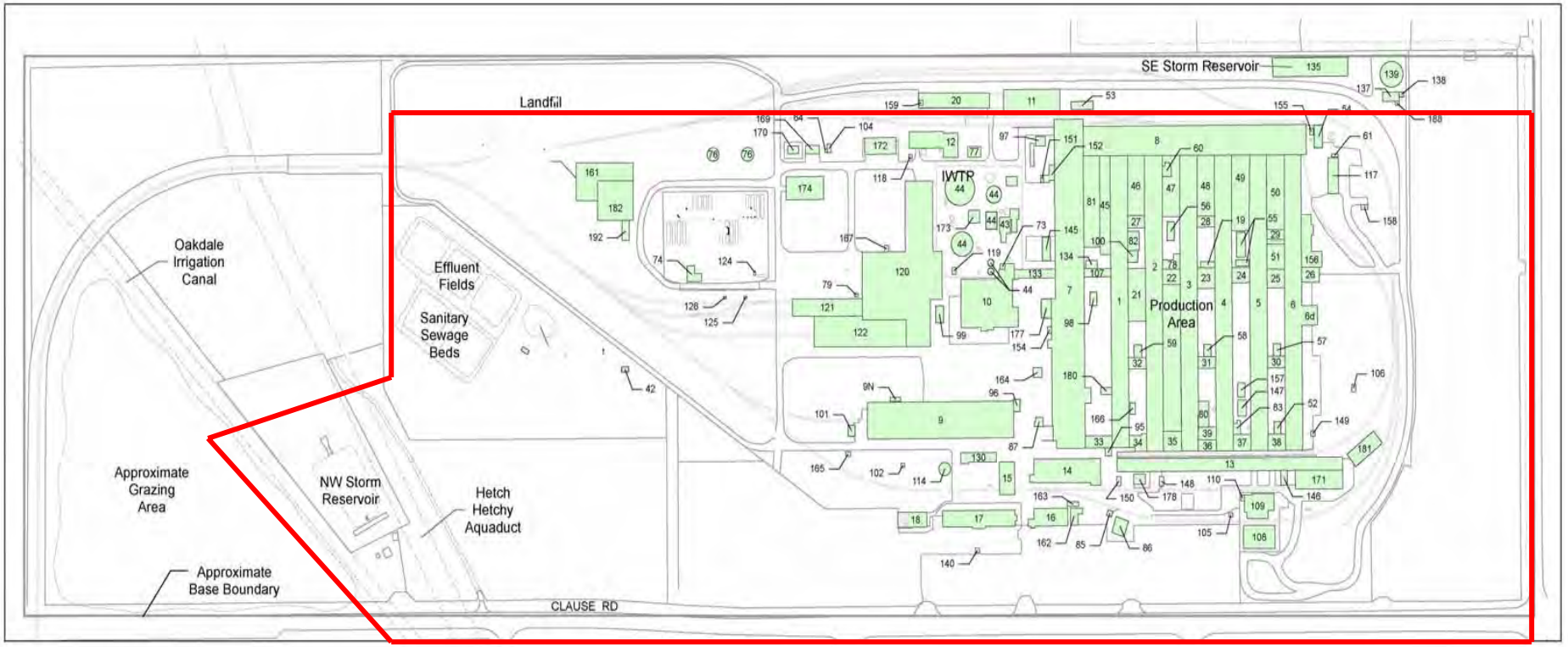
6.0 REFERENCES

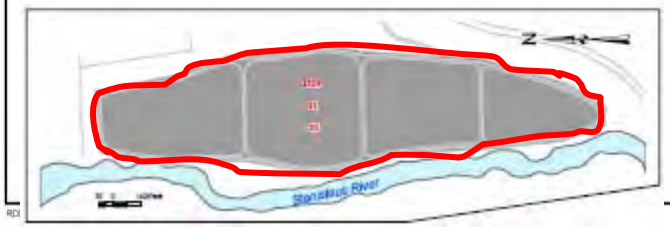
U.S. Army Environmental Center (USAEC), 1994 Record of Decision, Riverbank Army Ammunition Plant.

DTSC, 2006, RCRA Part B Permit, (05-SAC-06), May 6, 2006.

EPA, 2004, Preliminary Remediation Goals,
www. epa. gov/region09/waste/sfund/prg/index.htm

RWQCB, 2001, Notice of Adoption of Updated Waste Discharge Requirements for U.S. Department of the Army and NI Industries, Riverbank Army Ammunition Plant, WDR Order No. 5-01-200.





Legend:

Approximate Boundary of the RBAAP General Production and Operation Areas Subject to Land Use Restrictions

Buildings

FIGURE D-1
RBAAP General Production and Operation Areas Subject to Land Use Restrictions