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## List of Acronyms

1,2-DCP	1,2-dichloropropane
1,2,3-TCP	1,2,3-trichloropropane
1,3-DCP	1,3-dichloropropane
AST	aboveground storage tank
ACSD	Arvin Communities Services District
ARARs	Applicable or Relevant and Appropriate Requirements
B&B	Brown and Bryant
bgs	Below Ground Surface
BHHRA	Baseline Human Health Risk Assessment
CDHS	California Department of Health Services
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Chemical of Concern
CVRWQCB	Central Valley Regional Water Quality Control Board
CW	City Well
DBCP	1,2-dibromo-3-chloropropane
DTSC	Department of Toxic Substance Control (State of California)
EDB	Ethylene dibromide
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Difference
FS	Feasibility Study
FYR	Five-Year Review
gpm	gallons per minute
IAG	Interagency Agreement
ICs	Institutional Controls
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
OU-1	First OU
OU-2	Second OU
PM	Project Manager
ppb	parts per billion
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RP	Responsible Party
RPM	Remedial Project Manager

SVE	Soil Vapor Extraction
SVOC	Semi-Volatile Organic Compounds
TBC	To Be Considereds
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
UST	underground storage tank
VOC	Volatile Organic Compound

## Executive Summary

The U.S. Environmental Protection Agency (EPA) Region 9 has conducted the second five-year review (FYR) of the Brown and Bryant, Inc. (Arvin Facility) (B&B) Site in Arvin, California. The purpose of this FYR is to determine whether the remedial actions implemented at the site are protective of human health and the environment. This FYR is required because hazardous substances remain on-site above the risk-based levels determined in the Record of Decision (ROD), thereby preventing unlimited use and unrestricted exposure. The methods, findings, and conclusions of the review are documented in this report. In addition, this report summarizes issues identified during the review and includes recommendations and follow-up actions to address them. The triggering action for this review was the completion of the first FYR report on July 12, 2001.

The B&B Site is located at 600 South Derby Road in Arvin, California, see Figure 1. The B&B Site (CERCLIS ID No. CAD052384021) is approximately 18 miles southeast of the city of Bakersfield (Figure 1). The site covers approximately five acres and is bordered on the east by irrigated agricultural fields on the north and south by food packing and shipping facilities, and on the west by a residential area. Two schools (Gospel Tabernacle of Arvin and Stepping Stones Child Care Center) and a park (Bear Mountain Recreation and Park Center) are within 0.5 mile of the site. The Morning Star Preschool, at 416 North Hill Street is within one mile of the site. The site is currently vacant and secured by a chain-link fence. An engineered bituminous pavement cap covers the entire site and acts as a Resource Conservation and Recovery Act (RCRA) cap on the site's southern portion and as a non-RCRA cap in the site's northern portion. The structures currently present within the fenced area are a 405,000-gallon aboveground storage tank (AST; tank UN-32), a vacant warehouse, an open metal shed, and groundwater monitoring wells.

The B&B Arvin Pesticide Reformulation Facility (Facility) operated as a pesticide reformulator and custom applicator facility from 1960 to 1989. This facility formulated agricultural chemicals including pesticides, herbicides, fumigants, and fertilizers. In 1981, the B&B Facility was licensed under the RCRA as a hazardous waste transporter. Contamination of soil and groundwater resulted from inadequate procedural controls, chemical spills during operations, and leaks from an unlined surface wastewater pond and sumps.

Chemical contaminants have been detected in the surface soil, defined to include the upper seven feet of soil. This depth was selected because it corresponds to the depth where excavation might occur in the future for utility related work. Sampling results from the surface soil identified dinoseb as the only contaminant of concern. The principal area of highest concentration of dinoseb contamination occurs in the location of a former spill, along the east fence-line. High concentrations of dinoseb in surface soils were also found scattered in three other locations on-site and low concentrations were found over much of the site. The area of highest dinoseb contamination in the dinoseb

spill area was remediated in 1991; however, some soil contamination exceeding health-based levels still remains in this area.

Soil contamination from a depth of seven feet down to the A-zone groundwater was found over much of the site, but was primarily concentrated under four areas: the sump area, the dinoseb spill area, the waste pond, and a topographic low area between the pond and the large storage tank in the southwest corner of the site. Within these areas and over the entire site, six chemicals were identified as occurring at highest concentrations and to the greatest extent within the A-zone soils. These chemicals are 1,2-dichloropropane (1,2-DCP), 1,3-dichloropropane (1,3-DCP), 1,2-dibromo-3-chloropropane (DBCP), 1,2,3-trichloropropane (1,2,3-TCP), ethylene dibromide (EDB), and dinoseb. All of these chemicals except for dinoseb are volatile organic chemicals.

Fifty-six (56) organic compounds were found within the A-zone groundwater samples and 11 were found in the B-zone groundwater samples. As identified in the first operable unit (OU-1) ROD, the primary chemicals of concern (COCs) include chloroform, DBCP, 1,2-DCP, 1,3-DCP, 1,2,3-TCP, EDB, and dinoseb.

The remedial action was divided into a series of removal actions that included off-site disposal of remaining pesticide stock and drums, heavily contaminated soils, sumps, and removing the contents of tank UN-32 for off-site disposal. Tank UN-32 was cleaned and remains on-site. The OU-1 ROD (1993) addressed the site soils remedy and perched (A-zone) groundwater via extraction and treatment, as well as monitoring the A- and B-zone aquifers. The OU-1 remedial action included the following components: removed contaminated soils remaining on site (a previous removal action excavated and disposed the most contaminated soil off-site), and consolidated the soils on the south side of the site under a RCRA cap; placed a non-RCRA asphalt cap on the remaining property; monitored the deeper B-zone aquifer and existing downgradient city drinking water well City Well (CW)-1 to ensure migration of contamination from the shallow aquifer does not occur.

A five-year review site inspection took place on March 16, 2006. Following the site visit, the U.S. Army Corps of Engineers (USACE) conducted site interviews of residents living west of the B&B Site as well as the USACE site representative. The operating contractor, the USACE Project Manager (PM), and the EPA Remedial Project Manager (RPM) were interviewed by phone following the site visit. The five-year review was advertised in local newspapers to solicit public input.

This FYR addresses the OU-1 remedy. A second operable unit (OU-2) will address the contaminated groundwater associated with the site, including the perched zone known as the A-zone aquifer, originally intended to be addressed by OU-1. Transferring the shallow groundwater component to OU-2 will require, as a minimum, an explanation of significant differences (ESD). The OU-1 remedy as implemented has two primary components: 1) a RCRA asphalt cap on the south portion of the site and a non-RCRA asphalt cap on the north part of the site, and 2) monitoring the A- and B-zone aquifers. The following issues are associated with the site: 1) Cracks, rodent holes, and ponding

on the cap may allow surface water to migrate into contaminated soils under the cap and allow contaminated groundwater to migrate off-site. 2) Fencing has broken wire that may impact site security. 3) The vapor intrusion pathway may not be adequately evaluated. 4) Municipal well CW-1 may become contaminated so should be abandoned after a replacement well is installed. 5) Institutional controls (ICs) addressed in the ROD have not been implemented. 6) An optimized version of the previous monitoring program should be reinstated. 7) Active removal of contamination in the A-zone and unsaturated portions of the B-zone should be investigated to achieve accelerated site close out. 8) Transfer the shallow zone groundwater remediation from OU-1 to OU-2. 9) Update the current document repository.

The remedy is considered protective in the short-term since there is no evidence of currently complete exposure pathways to contaminated soils and groundwater. However, in order for the remedy to remain protective in the long term, performance standards specified in the ROD must be met; ICs, as identified in the OU-1 ROD for the selected remedy, need to be implemented; and on-going groundwater monitoring should be conducted. As the vapor intrusion pathway is evaluated, ICs related to vapor intrusion issues may be suggested.

## Five-Year Review Summary Form

SITE IDENTIFICATION		
<b>Site name (from WasteLAN):</b> Brown & Bryant, Inc. (Arvin Plant)		
<b>EPA ID ((from WasteLAN):</b> CAD052384021		
<b>Region:</b> 9	<b>State:</b> CA	<b>City/County:</b> Arvin/Kern
SITE STATUS		
<b>NPL status:</b> <input checked="" type="checkbox"/> Final <input type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
<b>Remediation status</b> (choose all that apply): <input type="checkbox"/> Under Construction <input checked="" type="checkbox"/> Operating <input type="checkbox"/> Complete		
<b>Site Wide FYR</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	<b>Construction completion date:</b> <u>12 / 31 / 1999</u>	
<b>Has site been put into reuse?</b> <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
REVIEW STATUS		
<b>Lead agency:</b> <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency		
<b>Author name:</b> U. S. Army Corps of Engineers		
<b>Author title:</b> HTRW CX	<b>Author affiliation:</b> U.S. Army Corps of Engineers	
<b>Review period:</b> <u>03 / 01 / 2006</u> to <u>08 / 15 / 2006</u>		
<b>Date(s) of site inspection:</b> <u>03 / 15-16 / 2006</u>		
<b>Type of review:</b> <div style="text-align: right; margin-left: 200px;"> <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only  <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead  <input type="checkbox"/> Regional Discretion         </div>		
<b>Review number:</b> <input type="checkbox"/> 1 (first) <input checked="" type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input type="checkbox"/> Other (specify)		
<b>Triggering action:</b> <input type="checkbox"/> Actual RA On-site Construction at OU # _____ <input type="checkbox"/> Actual RA Start at OU# _____ <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
<b>Triggering action date (from WasteLAN):</b> <u>07 / 12 / 2001</u>		
<b>Due date (five years after triggering action date):</b> <u>09 / 27 / 2006</u>		

## Five-Year Review Summary Form

### Issues:

#### Protectiveness Issues

- 1 Cracks present in asphalt cap, animal burrows and ponding water may allow water to migrate into contaminated soils under the cap and allow contaminants to migrate to groundwater.
- 2 Fencing has broken barbed wire strands that need to be repaired to maintain site security.
- 3 Vapor intrusion pathway for receptors in occupied structures off-site may not be adequately evaluated and addressed.
- 4 Due to the potential for contamination from the site, municipal well CW-1 should be abandoned and a new replacement well installed at another location
- 5 ICs need to be fully implemented.

#### Time/Cost Issues

- 6 Current monitoring program needs revision to reinstate periodic monitoring of a subset of the existing monitoring wells throughout the site but at a much less rigorous level than the original program in place from 2000 to 2004.

#### Technical Improvement Issues

- 7 A routine site-wide monitoring program that is not currently in place will provide information necessary to assess remedy performance.

#### Issues Related to Achieving Site Closeout

- 8 Significant contamination is present in the A-zone and potentially the unsaturated soils of the B-zone. Without active source treatment, the site will require long-term monitoring over an indefinite period of time and the mass may continue to migrate toward the drinking water aquifers.
- 9 The potential for contamination in the B- and C-zones will be reduced if the existing CW-1 is abandoned and replaced with another well.

#### Other Issues

- 10 Transfer the shallow zone aquifer remediation to OU-2.
- 11 Update the current document repository with all the pertinent submittals for the site.

## Five-Year Review Summary Form, cont'd.

### Recommendations:

#### Recommendations to Improve Protectiveness

- 1 Fill cracks, plug rodent holes and regrade the cap
- 2 Repair site fencing, including restringing the three-strand barbed wire where broken.
- 3 Complete ongoing vapor intrusion sampling and evaluation
- 4 Install a new city well and abandon existing CW-1
- 5 Implement ICs, including an IC monitoring program, to prevent groundwater use in the affected area and to prevent inappropriate use of the capped area.

#### Recommendations to Reduce Remediation Cost

- 6 Develop a routine long-term monitoring program that provides for annual sampling of most of a subset of available monitoring points, quarterly sampling of two sentinel wells near the existing municipal well, and biennial sampling of background or upgradient monitoring points.

#### Recommendations for Technical Improvement

- 7 Re-implement a site-wide groundwater monitoring program at the site (at a level of effort suggested in recommendation 6 above).

#### Recommendations to Achieve Site Closeout

- 8 Evaluate source treatment options for the A-zone and the unsaturated portion of the B-zone to decrease project life-span, and to make natural attenuation processes more effective at limiting increases in plume size.
- 9 Install a new city well, and properly abandon the existing CW-1.

#### Other Issues

- 10 Prepare an ESD to document that portion of the remedial action from OU-1 to OU-2.
- 11 Provide all pertinent documents to the repository located at the Beale Library in Bakersfield.

### Protectiveness Statement:

The remedy at OU-1 is considered protective in the short-term, and currently protects human health and the environment because the asphalt containment cap limits potentially complete exposure pathways to contaminated soil and groundwater. However, in order for the remedy to be protective in the long-term, the following actions need to be taken:

- performance standards specified in the ROD must be met;
- ICs, as identified in the OU-1 ROD for the selected remedy, need to be implemented; and,
- on-going groundwater monitoring should be conducted.

**Brown and Bryant Site  
Arvin, California  
Second Five-Year Review Report**

**I. Introduction**

This is the second site-wide FYR report of Remedial Actions for the B&B Site located in Arvin, California. The remedial action was divided into a series of actions that included removing the drums containing pesticides, herbicides and fumigants, heavily contaminated soils, tank UN-32 contents and sumps for off-site disposal. The OU-1 ROD (1993) also known as the Source Control Operable Unit (OU), consisted of consolidating contaminated surface soil in a 1.2 acre on-site landfill, covering that 1.2 acre parcel with a RCRA cap, and constructing asphalt cover over the remaining portion of the site. Remediation of contamination associated with the A-zone groundwater was originally planned as a part of the OU-1 work, but was deferred to OU-2. Formal deferral will be documented via an ESD. The OU-2 ROD is intended to prevent contamination present in the upper perched A-zone, and the deeper B-zone aquifers from migrating into the C-zone located approximately 350 feet below ground surface (bgs). The C-zone aquifer supplies domestic and irrigation water to the city of Arvin and the surrounding farms and orchards.

The purpose of FYRs is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports. In addition, FYR reports identify issues found during the review, if any, and identify recommendations to address them.

The EPA is preparing this FYR report pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) § 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c) states:

*If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

The EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) § 300.430(f)(4)(ii) states:

*If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.*

The purpose and focus of five-year reviews are further defined in EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.7-03B-P (EPA, 2001).

The EPA Region 9 has conducted a review of the remedial actions implemented at the B&B Site, 600 South Derby Street, Arvin, CA. This review was conducted between February and August 2006. This report documents the results of the review. The USACE provided analyses in support of this FYR through an Interagency Agreement (IAG) with Headquarters, EPA.

This is the second FYR for the B&B Site. The triggering action for this review was the completion of the first FYR report on July 12, 2001. Statutory review is required for sites where the selected remedy does not allow unlimited use and unrestricted exposure after the ROD remedial actions are completed and the clean-up goals have been met. The selected soil remedy for the site includes a containment cap, which will not allow for unlimited use of the site in the future, even if the completion of the remedial action satisfies the clean-up goals described in the ROD.

## II. Site Chronology

**Table 1: Chronology of Site Events**

EVENT	DATE
Initial Discovery	1981
State begins limited excavation of pond and sump areas	1987
B & B Arvin Facility Site placed on the NPL	1989
Excavation and Disposal of Soil and Liner	1990
Unilateral Administrative Order and Emergency Removal Action	1991
First RI/FS Report Completed	1993
OU-1 ROD Signed	1993
Remedial design complete OU-1	1997
Cap Construction and Related Activities Complete	1999
First Five Year Review Completed	2001
OU-2 RI/FS Report Completed	2004

## III. Background

The B&B Arvin Pesticide Reformulation Facility operated as a pesticide reformulator and custom applicator facility from 1960 to 1989. This facility formulated agricultural chemicals including pesticides, herbicides, fumigants, and fertilizers. In 1981, the facility was licensed under RCRA as a hazardous waste transporter.

Facility operations at B&B have resulted in the discharge of contaminants to the subsurface and surface soils, and certain contaminants have penetrated the groundwater in the shallow perched aquifer and the unsaturated soils below the perched zone. A deeper, regional aquifer has also been impacted. Contaminants of soil and groundwater resulted from inadequate procedural controls and chemical spills during operations, and leaks from a surface water pond and sumps. Several volatile organic compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs), herbicides and pesticides were detected in soil samples. The principal COCs identified are: DBCP; 1,2-DCP; 1,3-DCP; 1,2,3-TCP; EDB; chloroform; and dinoseb.

### **III.A Physical Characteristics**

The B&B Site is located at 600 South Derby Road in Arvin, Kern County, California approximately 18 miles southeast of the city of Bakersfield. The site covers approximately five acres, and is generally a rectangular, fenced-in parcel that is elongated towards the southeast. The site is topographically flat with a slight slope towards the south.

The city of Arvin is situated in the Tulare river basin on the southeastern edge of California's Central Valley, near the Tehachapi Mountains. The average elevation of the city is 440 feet above sea level (U.S. Geological Survey [USGS], 1992). The drinking water for the city of Arvin is supplied by the Arvin Community Services District. The main drinking water source is groundwater from five active wells, the depth ranges from 300 to 700 feet deep (Arvin Communities Services District [ACSD], 2001).

The site is currently vacant and secured by a chain linked fence. An engineered bituminous pavement covers the entire site. The cap is designed as a RCRA cap on the site's southeastern portion and as a non- RCRA cap in the site's northern portion. The structures currently present within the fenced area are a 1,200-gallon underground storage tank (UST), a vacant warehouse, an open metal shed, and groundwater monitoring wells. There are a total of 54 groundwater monitoring, extraction and injection wells on-site and on the adjoining properties (off-site) that have been used for collecting site information.

The EPA has divided the site into two OUs. OU-1 included the surface source of contamination, the A-zone groundwater, and the surface and sub-surface soils. OU-2 includes investigation of the deeper groundwater below the A-zone.

### **III.B Land and Resource Use**

Arvin is primarily an agricultural community and the B&B Site is located in a light industrial and commercial area within the city (EPA, 1993a). Irrigated agricultural fields lie east of the site. On the north and south there are food packing plants and shipping facilities. The site is bordered on the west by a paved two-lane highway separating the site from a residential area. The residential area contains two schools (Gospel Tabernacle of Arvin and Stepping Stones Child Care Center) and a park (Bear Mountain Recreation

and Park Center), located within 0.5 miles of the site. The Morning Star Preschool, at 416 North Hill Street, is located one mile away from the site.

### **III.C History of Contamination**

The largest releases on-site were from a waste pond, a sump area, and a dinoseb storage area. The waste pond was used to collect runoff water from the yard and from two sumps. The pond was also used to collect rinse water from rinse tanks used for fumigants. Excess pond water and rain water runoff also collected in a topographically low area to the south of the pond. In addition, water collecting on the site from precipitation and irrigation occasionally breached the berm at the southeast corner of the site and drained into the pond. The pond was double lined with a synthetic liner in November 1979, and the original unlined sump was replaced with two double-lined sumps in 1980. Dinoseb was stored in a smaller tank storage area along the eastern fence, just north of the pond. In 1983, there was a significant Dinoseb spill in this area.

Past inspections by the Central Valley Regional Water Quality Control Board (CVRWQCB) documented many instances of poor facility operations and maintenance practices (EPA, 2004). These inspections noted an on-site tank holding the chemical dinoseb and two unlined ponds for pesticide wastes were identified as being potential contaminant release areas. Past inspections also identified a 25,000-gallon pond had overflowed twice, and an on-site 560,000-gallon tank had leaked. In 1983 soil and groundwater sampling and analysis identified dinoseb as a COC with maximum concentrations exceeding 7,000,000 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ) in soil. These peak concentrations of dinoseb impact occurred in a former spill area along the east fence line and beneath a former pond and sump. In 1984, the California Department of Health Services (CDHS) identified various pesticides in on-site wells, including 1,2-dibromo-3-chloropropane, ethylene dibromide, dinoseb, 1,2-dichloropropane, and chlorobenzene (EPA, 2004).

In 1989, the site was listed on the National Priorities List (NPL) of Superfund sites. Subsequently various emergency and removal actions were initiated to minimize or eliminate immediate threats to human health and the environment.

### **III.D Initial Response**

From 1983 through 1988, B&B conducted several soil and groundwater investigations and remedial actions under CDHS supervision. The most significant work included the installation of 10 monitoring wells and the removal, in 1987, of some heavily contaminated soil beneath the two sumps and waste pond (EPA, 1993a). The lined waste pond in the southeast corner of the site was excavated in August 1987 by B&B. The liner and approximately 640 cubic yards of soil that showed visible signs of contamination were removed from the past pond. The depths of this excavation ranged from approximately 1.5 feet on the sides to 5 feet near the center (EPA, 2004).

B&B hired two engineering firms to conduct soil and groundwater investigations. The

soil impacted with COCs was also removed during one of these investigations and on-site soils were collected and analyzed for organics and trace metals (EPA, 1993a). The results of the analyses indicated high concentrations of pesticides in the soil. Generally, contamination was shallow with several areas contaminated with dinoseb. High concentrations of dinoseb were detected in soil along the east fence line. Contamination appeared to be most pronounced beneath former chemical handling areas. These areas include former sump location, former waste pond, and location of the dinoseb spill (EPA, 1993a).

Following listing of the site on the NPL in 1989, EPA immediately conducted an emergency response assessment and identified two areas needing immediate attention, a dinoseb spill area, and the groundwater which appeared to pose an imminent and substantial endangerment to the municipal drinking water. EPA treated the dinoseb-contaminated soil in the winter of 1991 under its emergency response authorities.

In October 1990, EPA issued general notice letters to two other site property owners, Atchison, Topeka and Santa Fe Railway and Southern Pacific Transportation Company (the Railroads). In January 1991, EPA issued the Railroads an administrative order to conduct certain investigations of the groundwater at the site. The work was completed in August of 1992.

### III.E Basis for Taking Action

OU-1 addresses the surface soil, the subsurface soil, and the A-zone groundwater (i.e., the first groundwater unit). According to the OU-1 ROD, the following chemicals have been identified as COCs:

<u>Surface Soil</u>	<u>Subsurface Soil</u>	<u>A-zone Groundwater</u>
Dinoseb	1,2-DCP	1,2-DCP
	1,3-DCP	1,3-DCP
	DBCP	DBCP
	1,2,3-TCP	1,2,3-TCP
	EDB	EDB
	Dinoseb	Dinoseb
		Chloroform

The contamination in the A-zone perched aquifer poses a potential threat to the underlying unconfined regional aquifer (B-zone) and the confined C-zone aquifer that is used for municipal drinking water. Public and private wells within 3 miles of the site provide drinking water to 7,200 people and irrigate 19,600 acres of croplands. Arvin CW-1 is 1,500 feet down gradient from the site (EPA, 2004).

The area around the B&B site is used for mixed residential and agricultural purposes. A city water production well, CW-1, is located 1,500 feet southwest of the B&B facility and is at risk of being affected by contaminants from the site. As part of the 1993 OU-1 Remedial Investigation/Feasibility Study (RI/FS), EPA conducted a Baseline Human

Health Risk Assessment (BHHRA) to determine the current and future effects of COCs on human health. The BHHRA evaluated only the dominant exposure pathways and contaminants that may significantly contribute to the potential site risk. Dinoseb was selected as the only COC that may significantly contribute to the site risk and incidental ingestion of surface soil was selected as the dominant route of exposure. The exposure assumptions used to develop the BHHRA identified children and young adult trespassers and a construction worker as potential receptors. Dinoseb does not appear to be carcinogenic; however, the calculated noncancer hazards indicate that there may be concern for potential adverse health effects.

#### **IV. Remedial Actions**

In May 1983, the CDHS inspected the Site to determine compliance with hazardous waste laws. At the time of the inspection, several violations involving storage, disposal, and transportation of hazardous waste were noted. Following the inspection, the CDHS directed B&B to correct the violations and conduct a site assessment. Between 1983 and 1988, B&B conducted site investigations under the supervision of CDHS. Limited cleanup work began under the supervision of the CDHS. In 1989, the B&B facility ceased operations. The Site was listed by EPA on the NPL of Superfund sites on October 4, 1989, and in that same year, all operations at the site ceased. Subsequently, various emergency and removal actions were initiated to minimize (or eliminate) immediate threats to human health and the environment (EPA, 1993a).

Additional work was completed by others in support of the Southern Pacific Transportation Company and the Atchison, Topeka and Santa Fe Railway Company (hereinafter referred to as the responsible parties [RPs]). The groundwater and soil investigations at the Site were conducted in response to the EPA Unilateral Administrative Order. These studies were also incorporated into the EPA RI/FS findings.

EPA completed the OU-1 RI/FS in May 1993. The EPA subsequently issued the OU-1 ROD in November of 1993. The selected remedy for OU-1 was consolidation of contaminated soil, installation of a RCRA/basic cap, and extraction and treatment of the A-zone groundwater. The goal of the remedial action was to prevent exposure to soil contaminated above health-based levels and to control the source of contamination to the B-zone groundwater (EPA, 1993d).

A treatability study for the shallow zone groundwater was conducted at the B&B site during December 1998 and was completed on April 6, 1999. An aquifer pump test was performed in May and June 1999 and the finished report completed in August 1999. The report indicated the sustained yield from any of the wells tested to be  $\leq 0.1$  gallons per minute (gpm). A soil vapor extraction (SVE) test was performed in August 1999 and the final report released in October 1999. SVE was not implemented at the site.

From December 28, 1998, to January 5, 1999, contaminated soil piles were consolidated in the area of the proposed RCRA cap. From January 6 to March 18, 1999, all on-site concrete structures and berms were demolished except for the concrete slabs contiguous to the warehouse building. During this period, a section of the existing asphalt pavement