

Comments on  
US EPA, “Five–Year Review for the Brown & Bryant Superfund Site, Arvin, CA,”  
Memorandum from T. Cain to K. Takata, Director Superfund Div.,  
US EPA Region IX, San Francisco, CA, July 12 (2001).

[[http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/29d66ce88371c6de882576e1005d5a82/\\$FILE/Brown%20&%20Bryant%20-%201st%205YR%207-12-01.pdf](http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/29d66ce88371c6de882576e1005d5a82/$FILE/Brown%20&%20Bryant%20-%201st%205YR%207-12-01.pdf)]

by

G. Fred Lee, PhD, PE, BCEE, F.ASCE and Anne Jones-Lee, PhD  
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[Page headings and quotations refer to the US EPA “Five–Year Review July 2011”]

US EPA “Five–Year Review, Page 1:

*“Location - The Brown & Bryant Inc., (B&B) facility is on an approximately five-acre parcel at 600 South Derby Road in Arvin, California. This site is located approximately 18 miles southeast of the city of Bakersfield, and two miles west of the Tehachapi Mountains.*

*Site Description - The site currently includes a vacant metal-framed warehouse, an open metal shed, and an aboveground storage tank (Tank UN-32), each located on concrete foundations. The aforementioned structures are adjoined by asphalt pavement, which extends out to the borders of the property. The asphalt is a RCRA cap in the site’s southern portion and a non-RCRA cap in the site’s northern portion. The RCRA cap is a three feet cap consisting of several layers including a Geogrid/sand layer, Geosynthetic clay liner, sand filter layer, aggregate base course and 3 inches of asphaltic concrete. The non-RCRA cap consisted of compacted sub grade material overlaid with 3 inches of asphaltic concrete.”*

The cap described in this section as a remediation approach for some of the pollutants in the soil and waste areas is a typical, low-cost, temporary US EPA and California regulatory agency RCRA cap. Many of the concerns about long-term threats posed by residue pollutants that are being left in the soils/waste areas are similar to those that are faced with closed landfills. Those issues are reviewed in our Flawed Technology review:

Lee, G. F., and Jones-Lee, A., “Flawed Technology of Subtitle D Landfilling of Municipal Solid Waste,” Report of G. Fred Lee & Associates, El Macero, CA, December (2004). Updated July (2011).

<http://www.gfredlee.com/Landfills/SubtitleDFlawedTechnPap.pdf>

A key issue that needs to be examined is how well the near-term and long-term reliability and efficacy of that remediation approach were evaluated and how will the public in the Arvin area was informed about the protection being afforded.

Some of the issues that are of concern about this approach are summarized below.

- What potential pollutants are present in the soil and waste disposal areas (constituents and concentrations) that are being covered by the asphalt cover and RCRA cap?
- Issue: site paved by asphalt pavement—is this pavement rigorously inspected to locate and seal cracks in it?

RCRA cap – *“The RCRA cap is a three feet cap consisting of several layers including a Geogrid/sand layer, Geosynthetic clay liner, sand filter layer, aggregate base course and 3 inches of asphaltic concrete. The non-RCRA cap consisted of compacted sub grade material overlaid with 3 inches of asphaltic concrete.”* The non-RCRA cap consisted of compacted sub grade material overlaid with 3 inches of asphaltic concrete.

How is the integrity of the geosynthetic clay layer (GCL) layer being evaluated to prevent water from penetrating through it? The 3-in-thick asphaltic pavement cover will develop cracks and areas of deterioration that will compromise the ability of the cover to prevent entrance of water into the wastes and the escape of volatile hazardous chemicals from the soils/wastes under the cover. The asphaltic pavement needs to be periodically inspected and resealed. Is this being done?

As discussed in our Flawed Technology review, a GCL layer is not necessarily reliable for preventing entrance of water that penetrates the asphalt (see Flawed Technology review pages 16–19).

As discussed in the professional literature, at best a GLC layer has many long-term integrity issues that preclude it from reliably preventing penetration of water; water that penetrates cover can then leach pollutants from the soil and wastes that are covered by this layer, which, in turn, presents a long-term threat for groundwater pollution. Far too often regulatory agency staffs do not adequately consider the professional literature that addresses this issue, and instead assume that the theoretical design permeability of a GLC will be achieved and maintained across the waste area for as long as the covered wastes will be a threat, which could be many decades to hundreds of years or longer.

We want to see the engineering report(s) that

- describe the currently known pollutants and their concentrations in the B&B soils and waste areas
- describe the potential mobility of the residue pollutants in the area soils
- justify the use of GLC layer to prevent the migration of the pollutants in the waste areas that can lead to continued groundwater pollution.

An issue that needs to be addressed is the reliability of the groundwater quality monitoring program for detecting the incipient failure of the GLC layer to prevent further migration of pollutants in the B&B site soils and waste areas to areas groundwater, and thereby impair the use of the groundwater for domestic and agricultural water supply?

What assurance is there that adequate groundwater monitoring is being conducted to detect continued groundwater pollution by the residue pollutants at the B&B site for as long as the wastes at the site are a threat?

US EPA “Five–Year Review, Pages 1–2:

*“Adjoining Property Description - The site is bordered to the east by irrigated agriculture fields, to the north and south by food packing and shipping facilities, and to the west by residential dwellings. Two schools and a park are located within 0.5 miles of the site. The Water*

*District Supply Well 1 (Municipal Well 1), about 1,700 feet south-southeast of the site, is one of five active wells that provide drinking water for the residences in Arvin.*

*“**Geology & Hydrogeology** - The B&B facility is located approximately 425 feet above sea level in the Tulare sub-basin of the San Joaquin Valley. It is located on the distal end of an alluvial fan. The soils underlying the site are alluvial deposit comprised of alternating layers and mixtures of unconsolidated sands, silts, and clay. Soil underlying the site to a depth of 80 feet generally consists of silty fine sand to fine sandy silt. Clean well-graded sand lenses and thin seams of silty clay occur locally within these soils. The soils are thinly interbedded, with textural changes occurring every few vertical inches. These textural changes are also believed to occur laterally.*

*The site geology has been divided into three zones, the A-zone, B-zone and the C-zone. The A-zone includes unsaturated soil between the surface and 65 to 75 feet below ground surface (bgs) and includes the first water bearing unit, the A-zone groundwater. The depth to groundwater in the A-zone varies between 65 and 85 feet bgs, as recorded in recent groundwater depth measurements.*

*The B-zone includes unsaturated soil below the A-zone and the second lowest water-bearing unit (B-zone groundwater), starting between at [sic] 150 to 165 feet bgs. The B-zone extends to at least 250 feet bgs and ends at a clay layer referred to as the Corcoran Clay. The C-zone starts below the Corcoran Clay, which confines the drinking water aquifer.”*

Overall, the hydrogeology of the site under the B&B site is fairly complex, which will make the pollutant transport within and from the site to nearby water supply wells difficult to reliably monitor.

We want to see the engineering reports that provide the data that serve as the basis for the characterization of the hydrology of the area. Have the monitoring wells been positioned to provide a high degree of reliability of detecting pollutant migration from the site to nearby groundwaters that are used for domestic water supply?

US EPA “Five-Year Review, Page 2:

*“**Site History (1960 to 1993)** - The B&B facility operated as an agricultural chemicals reformulator and custom applicator facility from 1960 to 1989. The agricultural chemicals formulated at this facility included pesticides, herbicides, fumigants, and fertilizers. In 1981, the facility was licensed under the Resource Conservation and Recovery Act (RCRA) as a hazardous waste transporter.*

*Contamination of soil and groundwater resulted at the B&B facility from inadequate procedural controls, poor housekeeping, chemical spills during operations, and leaks from a surface wastewater pond and sumps. The site formerly contained tanks holding dinoseb and two unlined ponds for pesticide rinse water. An onsite 250,000-gallon waste pond was noted as overflowing twice. The largest releases onsite were from the waste pond, a sump area, and a dinoseb spill area.*

*Previous soil investigations conducted to a depth of 7 feet bgs indicated that dinoseb was the only contaminant of concern (COC). The principal hot spot of dinoseb contamination occurred in the location of a former spill along the east fence line. High concentrations of dinoseb in soils were also found scattered in three other locations onsite and low concentrations were found over much of the site. The area of the highest dinoseb contamination was cleaned up in 1991.*

*Soil contamination between 7 feet bgs and the A-zone groundwater was found over much of the site, but was concentrated at the sump area, the dinoseb spill area, the waste pond, and in a topographic low area between the pond and the large storage pond in the site's southwestern corner. Within these areas and over the entire site, six chemicals were identified as occurring at elevated concentrations and to the greatest extent within the A-zone. These COCs included, 1,2-dibromo-3-chloropropane (DBCP), 1,2-dichloropropane (1,2-DCP), 1,3-dichloropropane (1,3-DCP), ethylene dibromide (EDB), 1,2,3-trichloropropane (TCP), and 2-sec-butyl-4,6-dinitrophenol (dinoseb).*

*All of the chemicals are volatile organic compounds (VOCs) except for dinoseb. The VOCs were found in the subsurface soils over the entire site. The center of the sump area had the highest VOC concentrations. Concentrations were highest in soils between 20 and 30 feet bgs, but were found at concentrations greater than 1 mg/kg over most of the A-zone beneath the site. 1,2-DCP was the VOC found at highest concentrations, followed by DBCP, TCP, EDB, and 1,3-DCP. In the pond area, the highest contaminant concentrations were found at a depth of 30 to 40 feet bgs."*

What recognition was given to the fact that the approach that was used to determine the pollutants in the soils and groundwater could readily fail to detect a plethora of potential pollutants that are a threat to human health and the environment?

US EPA "Five-Year Review, Page 3:

*"1987 - In 1987, Hargis & Associates (H&A) presented a work plan to assess the extent of soil and groundwater contamination resulting from the release of onsite chemicals (H&A, 1987). The H&A work plan presented the results of shallow soil sampling and the groundwater testing (Wells AMW-1 through AMW-4) conducted in 1984 by H&A. The water and soil samples collected from these wells/borings were noted as having elevated COC concentrations. The collected data was used to plan their on-site assessment. H&A implemented this work plan in 1987 and 1988 (H&A, 1988). H&A's investigation included sampling vadose zone soils and the installation of six additional monitoring wells (AP-1 through AP-5, and AR-1; each located onsite). COCs were detected in each of the wells.*

*In August 1987, Canonie Environmental excavated the shallow impacted soils beneath the former on-site sumps and pond to depths of up to 12 feet. Soil samples collected from the base of the excavations were reported with elevated COC concentrations. Groundwater testing was not conducted during this remedial action.*

**1993 Ecology and Environment, Inc. RI/FS** - *In August 1993, Ecology and Environment, Inc. (E&E) presented a remedial investigation feasibility study report for the site. This report presented the findings of a remedial investigation that included assessing groundwater in the A-*

zone aquifer and the B-zone aquifer. Seven COCs as well as approximately 49 other organic compounds were found widely distributed and at elevated concentrations in water within the A-zone. The highest concentrations were observed in a well located near the former sump (AMW-2P), a well located west of the sump (WA-6), and wells located near the former pond (AMW-1P, EPAS, and EPAS-3). The distribution of the contaminants was consistent with the locations of the major source areas and followed a pattern consistent with groundwater flow in the A-zone. 1,2-DCP was found to be the most wide-ranging contaminant in the A-zone (over 5.5 acres). This contaminant 1,2-DCP was also reported in water samples collected from wells in the B-zone.

**1993 EPA Record of Decision** - In November 1993, the EPA issued a Record of Decision (ROD) that described the selected remedial action for the First Operable Unit (OU-1), surface and subsurface soils, and A-zone groundwater. The Second Operable Unit (OU-2), the B-zone groundwater will be address in another ROD at the B&B Superfund Site. The major components of the remedy identified in the ROD of 1993 included:

- Extract, treat, and re-inject groundwater of the shallowest groundwater unit
- Consolidate contaminated surface soil on the 1.2 acre portion of the site
- Construct RCRA Subtitle C cap over the 1.2 acre portion
- Construct a basic (non-RCRA) cap over the remaining portion of the site

The ROD of 1993 is the first of two planned operable units for this site. The First Operable Unit (OU-1) addresses the surface soil, the subsurface soil and the shallowest groundwater unit, the A-zone groundwater. The function of OU-1 is to address the principal threat at the site, the A-zone groundwater, and to address the surface soil exposure threat. OU-2 will address the B-zone groundwater unit.”

US EPA “Five–Year Review, Page 4:

### **“3.0 FIVE-YEAR REVIEW SUMMARY**

**1998 and 1999** – A part of the OU-1 remedy tasks were completed by Morrison Knudson Corporation (MK) in the latter part of 1998 and the early part of 1999. At this time, shallow soil samples were collected throughout the site to further assess the extent of impacted soil in areas with known COCs. Soil with elevated COC concentrations as well as existing contaminated soil piles throughout the site were excavated and consolidated beneath the RCRA cap area. Approximately 70 cubic yards of contaminated soil were moved to the RCRA cap area and compacted. In addition to the assessing and consolidating contaminated soil, MK also assisted in the removal of one 1,200-gallon underground storage tank, demolition of small onsite structures, removal of onsite railroad tracks, removal of underground utilities, removal of drums, and pressure washing the walls and floor of the warehouse. MK also managed the import of clean soil materials to the RCRA cap area, site grading, and the construction of the RCRA and non-RCRA caps within the site.”

This approach for site remediation/storage of hazardous chemical pollutants has created a large waste pile that will be a threat to pollute groundwater for many years, i.e., until the identified pollutants and any unidentified and unknown pollutants and otherwise deleterious chemicals have decayed or have left the area by polluting the groundwater.

US EPA “Five-Year Review, Pages 4 and 5:

*“February 1999 - In February 1999, E&E reported the results of groundwater sampling conducted in July 1998 and January 1999 (E&E, 1999a and 1999b). The laboratory summaries indicated relatively elevated COC concentrations remained within groundwater collected from the onsite and offsite wells. The areal distribution of four COCs was provided with the July 1998 results. The four COCs were shown as underlying most of the site’s central and southern portions, and extending offsite toward the southwest, south, and southeast.*

**June 1999 “Adjoining Property Description** - *The site is bordered to the east by irrigated agriculture fields, to the north and south by food packing and shipping facilities, and to the west by residential dwellings. Two schools and a park are located within 0.5 miles of the site. The Water District Supply Well 1 (Municipal Well 1), about 1,700 feet south-southeast of the site, is one of five active wells that provide drinking water for the residences in Arvin.*

*- Since July 2000, Panacea, Inc. (Panacea) has been conducting quarterly groundwater monitoring of 23 wells within and adjacent to the site. A city well, Well-1, was also sampled during the quarterly monitoring. Based on data collected during the quarterly sampling events (three since July 2000), the groundwater contaminant plume within the A-zone was noted to cover an area roughly circular in shape, with a diameter of approximately 950 feet. The center of the plume was roughly centered beneath of the RCRA-capped area. The impacted groundwater extends more than 300 feet east and west of the site, and more than 450 feet south (roughly down gradient) of the site. The contaminant plume within the A-zone extends east, south, and west to the farthest monitoring wells.*

*Data collected by Panacea showed that the highest contaminant concentrations in groundwater in the A-zone remain immediately south of the site’s southern side and within the vicinity of the aboveground storage tank. From this general vicinity, the contaminants appear to have migrated out in each direction.*

*The COC 1,2-DCP was reported with the highest contaminant concentrations in the A-zone, ranging up to 62,800 µg/L. The concentration of 1,2-DCP has remained at similar concentrations in the onsite wells during the quarterly monitoring events. The COCs DBCP, dinoseb, TCP, and chloroform were also reported at relatively elevated concentrations. These COCs are present beneath most of the site, and east, south, and west of the site. The highest concentrations of these COCs are located in groundwater beneath and south of the site’s southern side, and beneath and west of the site’s southwestern portion. The highest concentration of chloroform was reported in groundwater collected from a well (WA-2) located approximately 450 feet southwest of the site.*

*Panacea noted that a well-established contaminant plume has not been established within the B-zone after examining data from existing groundwater monitoring wells. The detectable COCs within the B-zone were reported in wells located in the site’s southern portions, and south of the site. COCs were detected within three of the B-zone wells (AMW-4R, WB2-1, and WB2-3). The MCLs of COCs in two of the wells (AMW-4R and WB2-1) have been exceeded. The Arvin Water District Well (Municipal Well 1) south of the site has remained clean of contaminants.”*

We want to see the engineering reports that served as a basis for this summary.

Has any consideration been given to the potential for the municipal wells to be polluted by so-called non-hazardous chemicals derived from the B&B site, which, while not categorized as “hazardous,” still render the well water unusable for domestic purposes?

US EPA “Five-Year Review, Page 5:

#### **“4.0 RECOMMENDATIONS**

*It is recommended that additional groundwater monitoring wells be installed within the A-zone and B-zone to assist in delineating the extent of the impacted water out from the site. The new wells should be monitored in conjunction with the existing wells, on a quarterly basis.*

#### **5.0 CONCLUSION**

*I certify that the remedy selected for this site remains protective of human health and the environment. The remedy is expected to be protective of human health and the environment upon completion, and immediate threats have been addressed. The approved Health and Safety Plan is in place for the current remedial investigation. EPA has confirmed by ongoing groundwater monitoring during the current remedial investigation that the existing supply of water is not impacted. Additional groundwater monitoring wells will be added under the current remedial investigation to fully characterize the offsite groundwater at the Brown and Bryant Superfund site. Based on the expected continuing presence of contamination at this site at levels which preclude unlimited use and unrestricted exposure, the next Five Year Review will be written by five years from the date of signature of this review.*

*Approved by: Keith Takata, Director Superfund Division date: July 7, 2011”*

The recommendation that there is need for considerable additional investigation to adequately characterize the public health threat posed by the so-called “remediation” approach that has been adopted by the US EPA thus far for the B&B site is appropriate.

The conclusion, “*The remedy is expected to be protective of human health and the environment upon completion, and immediate threats have been addressed*” is not in supported by basic principles of public health protection. The US EPA remediation approach of onsite storage of hazardous chemical under a so-called RCRA cap is, at best, a stop-gap approach that can be inappropriately used to relieve the US EPA of responsibility for site investigation/remediation and to transfer responsibility for addressing the true long-term public health threats left by this approach to site remediation to the California Department of Toxic Substances Control. Perhaps the most disturbing aspect of this situation is that the US EPA has misled the public concerning the adequacy of this remediation approach for protecting the public from the residual hazardous chemicals that are being left at this so-called “remediated” site, for as long as the residual pollutants will be a threat to human health. It is also unclear whether or not the US EPA and the other B&B site governmental site managers (RPMs) have developed an ongoing, periodic (at least quarterly) site inspection and remediation plan for the capped areas.