

Comments on “Value Engineering Study – Brown & Bryant Operable Unit No.2
Superfund Site” developed by US Army Corps of Engineers
for US EPA Region 9, dated March 22, 2010

Comments submitted to CBA by
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On January 30, 2012 the US EPA Regional B&B Superfund site manager, B. Davila, forwarded to us the report, “Value Engineering Study (VE) – Brown & Bryant Operable Unit No.2 Superfund Site” developed by US Army Corps of Engineers for US EPA Region 9, dated March 22, 2010.” Presented below are comments on key elements of that report.

Basically a VE study is an independent review of alternatives for remediation of a project, in this case of the B&B Superfund site remediation approaches that were adopted in the OU-2 ROD. The description of the VE study for the B&B site is provided subsequently in these comments.

The Executive Summary of the Value Engineering (VE) study report for the B&B site states,
“*General*

This report documents the results of a value engineering (VE) study on the project: Brown and Bryant Superfund Site, Operable Unit Number 02, Arvin, California.”

“There is a signed Record of Decision (ROD) for this project. The design by ECO and Associates, for the Arbor Well and Ground Water Monitoring Network is underway. The remedial action, construction, will probably be accomplished through an Invitation For Bids or use an in-place unit contract, Preplaced Remedial Action Contract, (PRAC). An exit review of the preliminary results of the study was conducted with the team at the conclusion of the second day.

“The VE team was given the task of studying the project documents, applying VE methodology, and developing recommendations and comments to provide overall added value to the completed project.”

The “*Estimate of Construction Cost*” section of the Executive Summary states:

“The summary of costs for the selected remedy is shown in table 12-1 in the ROD and summarized below:

| | |
|-----------------------------------|----------------------|
| <i>Capital and Periodic Costs</i> | <i>\$3,645,000</i> |
| <i>Annual Operating Costs</i> | <i>\$1,700,000</i> |
| <i>Most Likely Total Costs</i> | <i>\$15,585,000”</i> |

The “*Summary of Recommendations*” in the VE report states:

“The Summary of Recommendations List represents a summary of the ideas that have been developed into recommendations for this project. Since cost is an important issue for comparison of VE Recommendations, the costs presented in this report are based upon original quantities with unit prices, using government estimates where possible. Where proposed alternate designs included items not in the original estimate, estimating databases or vendor quotes were used.

Some recommendations were developed by the VE team but were withdrawn for the reasons stated in the justification paragraph of the recommendation. Those recommendations are included in the below summary as ‘Withdrawn’.”

The table of “Summary of Recommendations” provided in the Executive Summary follows:

Table 1 Summary of VE Recommendations

| VE Sequence Number | VE REC Number | Description | Potential Savings (Cost) |
|--------------------|---------------|---|--------------------------|
| 1 | 1&2 | Install directional wells | \$5,597,000 |
| 2 | 5 | Stimulate biodegradation in A-zone groundwater | \$6,924,500 |
| 3 | 6 | Stimulate biodegradation in B-zone unsaturated soils | (\$1,798,000) |
| 4 | 9 | Groundwater extraction in B-zone | (\$278,150) |
| 5 | 11 | In-situ thermal remediation | (\$700,000) |
| 6 | 22 | Co-metabolic biosparging in B-zone | (\$2,600,000) |
| 7 | 40 | Belled-out caisson to reduce volume of excavated soil | \$297,000 |
| 8 | 55 | Remove contaminated soil that is under the existing capped area | \$5,540,000 |

The table of “Withdrawn Recommendations” provided in the Executive Summary follows:

Table 2. Withdrawn Recommendations

| Creative Idea ID # | Description |
|--------------------|---|
| 4 | Constructed a slurry wall with extraction wells |
| 10 | In-situ chemical oxidation of unsaturated B zone |
| 12 | Remove contaminated soil from A zone |
| 16 | Contaminant sequestration or stabilization A zone |

Following are excerpts from the main body of the VE study report.

“SECTION 1 -INTRODUCTION

“This report documents the results of a value engineering (VE) study on the project: Brown and Bryant Superfund Site, Operable Unit Number 02, Arvin, California.”

“Value Engineering

The following is a note to those persons unfamiliar with value engineering. Because there is a value engineering study, and because recommendations for changes to the design have been made, one should not assume there is a problem with the existing design.

The value engineering team is called primarily to look for ways to add value to the project by suggesting alternatives the team believes will lead to improvement. It must be understood that a VE team works from a different perspective than does the design team. The value engineering team represents a second opinion with the benefit of hindsight and with the ability to challenge the owner's instructions to the designer.

In addition VE studies are done on designs in progress. Some recommendations will cover items that are still in a state of change, thus causing the recommendations, in certain cases to be irrelevant. In other instances, the design team will already be intending to do the things the recommendations are suggesting.

The VE recommendations simply represent an attempt at a different way of looking¹ at the problem to be solved and are presented as additional ideas for consideration by both the owner and the designer.

The final decision as to the acceptance of these recommendations and suggestions rests ultimately with the owner and the designer.”

“VE Recommendations

Part of the value methodology is to', generate as many ideas as is practical, to then evaluate each idea, and to select as candidates for further development only those ideas that offer added value to the project. If an idea thus selected, turns out to work in the manner expected, then that idea is put forth as a formal value engineering recommendation Recommendations represent only those ideas that are proven to the team's satisfaction.”

The “Section 2 – Project Description” section of the VE report stated:

“Description of the Selected Remedy

The remedial action for OU-2 at the B&B Site addresses contaminated groundwater. The overall cleanup strategy for the B&B Site is to reduce contamination in groundwater to protect human health and the environment. The contaminated groundwater in the B-zone above the cleanup levels is considered to be a threat to-human health and the environment at the Site. The selected remedy reduces the threat of further groundwater contamination within the B-zone groundwater by extracting and treating the groundwater in the shallower A-zone, the source of contamination in the B-zone groundwater. To remove the potential threat to human health, the selected remedy will also use monitored natural attenuation (MNA) in the B-zone groundwater, a

potential source of drinking water, placing institutional controls on the Site and nearby properties to prevent the use of B-zone groundwater until such time as drinking water criteria are attained and relocation of the Arvin City Well CW- 1 to remove the threat of cross contamination from the A-zone and the B-zone to the C-zone, as this well has potential to be a conduit. Extraction and treatment of A-zone groundwater was a component of the selected OU-1 remedy. However additional investigation was necessary for adequate design and implementation of A-zone groundwater remediation component. Therefore the A-zone groundwater extraction and treatment component of OU-1 selected remedy was not installed but was carried over to the OU-2.”

That statement is a good summary of the currently proposed remediation of the contaminated groundwater at the B&B site.

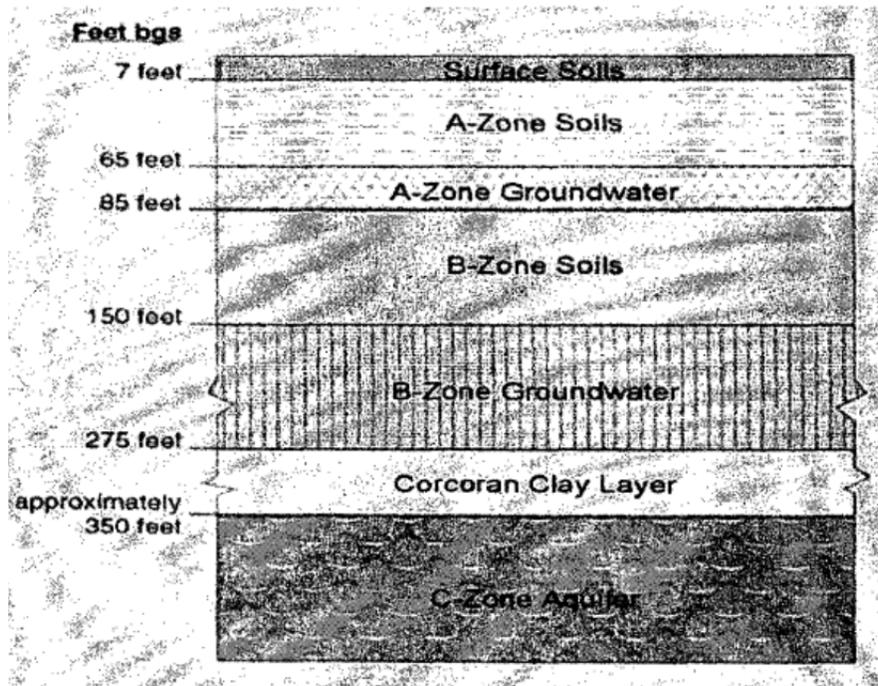
The section went on to state:

“The major components for the OU-2 include:

- *Relocation of the Arvin City Well CW- 1: Properly abandon the existing Arvin CW- 1 and relocate a replacement well a suitable distance from the known B&B Site OU-2 plume.*
- *Installation of an extraction system in the shallow A-zone aquifer with above ground ultraviolet (UV)/oxidation water treatment and disposal of the treated water to the City of Arvin sewer system.*
- *Monitored Natural Attenuation: Conduct groundwater monitoring of the B-zone to evaluate: 1) the effectiveness of the remedy, 2) the location of the plume, and 3) that remediation goals have been met by natural attenuation in the B-zone. This component will include an MNA performance plan during implementation of the remedy, which will include details of the groundwater monitoring and natural attenuation progress evaluation for the B-zone groundwater. Actual performance of the natural attenuation remedy will be carefully monitored in accordance with the MNA Performance Plan. If monitoring data indicate that the COC levels do not continue to decline, as estimated in the fate and transport model, EPA 'and DTSC will reconsider the remedy decision.*
- *Place institutional controls on the Site and nearby properties to limit use of B-zone groundwater.*
- *See soil layering system diagram below:*

Soil Layering Diagram

Figure 5-2, Brown and Bryant Superfund Site Soil Layering System
(Reproduced from the B&B Site RI/FS Report Figure I-6)



The remainder of this VE report is devoted to a discussion of the alternatives for remediation of the OU-2 components. This is a good discussion of the issues that need to be considered in evaluating the remediation approaches established in the OU-2 ROD. Those interested in these issues should review the details of this part of the VE report. A brief summary of these issues is presented below.

Alternative to Remediation of OU-1

Table 1 above lists the alternative remediation approaches considered and adopted by the VE team. For remediation of the polluted soils and groundwater in the A-zone the VE team suggested that horizontal wells be used to extract the polluted groundwater as an alternative to the approach adopted in the ROD of constructing several large-diameter wells in the A zone. The horizontal wells have the potential to remove large volumes of A-zone groundwater at a potential cost savings of about \$5.6 million. It has been our experience that the horizontal well approach is a technically valid approach for removing the pollutants in the A-zone; it could also be a more cost-effective method for removing the pollutants from the A-zone. The potential “Disadvantages” listed on page 16 can be adequately managed.

It is important to note, as discussed on page 39 of the VE report, that the horizontal well approach does not address the subsequent of pollutants from the soils/strata in OU-1; i.e., it only removes the pollutants that are present in the groundwater in OU-1 at the time of pumping as

well as those that are readily desorbed (released) but does not address the long-term release of pollutants from the solids that will occur in the future. This issue could be addressed to a large extent by continued operation of the horizontal wells as the groundwater in OU-1 becomes polluted again by slow release from the solids. This concern also exists for the current design of remediation of OU-1 using the large-diameter vertical wells. The VE team offered an alternative on page 39 that would involve removing all of the soils/strata under the cap at the site. If, after removing the polluted groundwater in OU-1, it is found that OU-1 continues to be a significant source of pollutants for OU-2 that greatly extends the remediation time for OU-2, it may become necessary to remove the soils/strata in OU-1 and backfill with clean soil; the VE team estimated an additional cost of \$5.5 million for that approach.

Table 1 also listed the use of enhanced stimulation of biodegradation in the A-zone groundwater as an alternative for removal of pollutants from the A-zone. The potential use of this approach will require considerable laboratory studies to evaluate the potential effectiveness of this approach. As noted on page 20 that approach has a number of potentially significant disadvantages. Based on our experience with stimulated bioremediation, we would not recommend this approach.

Alternatives to Remediation of OU-2

The VE team examined the use of stimulated biodegradation in B-zone unsaturated soils as an alternative to monitored natural attenuation of OU-2 to remediate several of the pollutants in the B-zone. That approach, which is discussed beginning on page 22 of the VE report, has merit in order to shorten the time needed to remediate B-zone for some, but not all, of the pollutants in the B-zone. The estimated additional cost is about \$1.8 million.

The VE team examined the potential to shorten the time needed to remediate the B-zone using groundwater extraction of the B-zone with treatment of the extracted groundwater to remove the pollutants. The estimated cost would be about \$278,000 and it could significantly reduce the time needed to remove the B-zone pollutant from the existing groundwater pollution plume. We feel that this approach has considerable merit and should be considered as a supplement to the monitored natural attenuation.

We do not find that the other alternatives for remediation of the B-zone polluted groundwater are of sufficient merit to warrant further consideration because of the high cost and/or lack of effectiveness for some pollutants.

We agree with the VE team assessment that the Table 2 Withdrawn Recommendations do not warrant further examination.

Overall, the Corps of Engineers Value Engineering review was useful for examination of some of the alternatives for reducing the cost of remediation of the pollution of the B&B Superfund site and also reducing the time for site remediation.