

**Picatunny Arsenal
EPA/DEP Team Meeting
February 22, 2011**

Draft Meeting Minutes

Attendees: Tim Llewellyn - ARCADIS
Dave Lipson - ARCADIS
Carol Mowder - ARCADIS
John Cherry - ARCADIS
Nancy Flaherty – USACE
Ted Gabel – Army
Greg Zalaskus - NJDEP
Jim Kealy - NJDEP
Joe Marchesani – NJDEP
William Roach – USEPA

Via Phone: Mary Ellen Maly - USAEC
Rob Snyder - Army

Agenda Items: The following sites were discussed and decisions reached

Meeting Objectives and Agenda Items

Arcadis reviewed the meeting objectives: 1) reach preliminary consensus on the remedial approach and path forward at Mid-Valley; 2) discuss status of EPA/DEP position on soil ARAR issue; 3) discuss IAG/DSMOA/Army RIP-RC schedule; and 4) provide status update on other sites including the 5-year review.

The goals for 2011 include: 1) Proposed Plans at Mid-Valley (PICA 204) and the Lakes sites (PICA 057); 2) Remedial Design at Lower Building Ground (PICA 002); and RIP at PICA 013 Groundwater.

Mid-Valley

Arcadis provided an overview of recent activities at Mid-Valley including the field scope that was completed between June and October 2010; the current conceptual site model, and the remedy evaluations conducted to date. A preliminary recommendation of addressing the part per million (ppm) levels of trichloroethene (TCE) at the head of the plume in the vicinity of Building 3109 using EVO injections was presented. It is anticipated that the remedial goals would be met within 35 years using this remedy. A discussion between the Army team, DEP, and EPA is summarized as follows.

- Arcadis provided an overview of recent activities at Mid-Valley including the scope of work completed between June and October 2010; a detailed discussion of the conceptual site model (CSM) that has been revised based on recent supplemental investigation activities; and provided an overview of the remedial alternatives under evaluation for the Feasibility Study (FS) Addendum.
- An FS Addendum will be submitted to the Army in March and then to the regulators with a goal of approval in July 2011. The FS Addendum will address the southern TCE plume (along Robinson Run). The Army and ARCADIS also aim to have a final Mid-Valley Proposed Plan approved in calendar year 2011.
- The FS Addendum will provide an updated CSM, a hydrogeological model and remedial timeframe estimation, and an evaluation of five alternatives for the southern TCE plume: No

action, Monitored Natural Attenuation (MNA), a treatment trench, a pump & treat hydraulic containment system, and enhanced reductive dechlorination (ERD).

- Remedial time frame estimates range from about 190 years for MNA to about 35 years for ERD. It was noted that the diffusion rate in the core of the plume is a controlling factor for the cleanup timeframe for the whole plume. While the downgradient tail of the plume could be flushed out within about 35 years, the core of the plume would have to be contained and/or treated or else diffusion from this area would continue to migrate downgradient for the estimated 190 years.
- Regarding the ERD alternative using emulsified vegetable oil (EVO), EPA and DEP asked a series of questions, including whether the EVO moves at same rate as groundwater; how it is dissolved; how far it will disperse; how the EVO treats the TCE diffused into the rock; whether the EVO degrades before it reaches Robinson Run; whether it should be combined with a more soluble carbon source; and whether the variable water levels would be a factor.

ARCADIS explained that groundwater flow in the fractures is relatively fast. A more soluble carbon solution would flush out quickly. The benefit of EVO is that it will adhere better to fracture walls and allow for a slow release of carbon over time. This allows for less frequent injection cycles and more effective treatment. The EVO will disperse through the fractures in the bedrock, which would effectively be the same channels that groundwater and contamination follow. Monitoring of new/existing wells would help evaluate dispersion into the formation as well as in the direction of Robinson Run.

ARCADIS clarified that the EVO is applied in the dissolved phase. The EVO is about 50% oil and the rest is a mix of lactate and emulsifiers, but the solution is diluted to about 2%. Regarding diffusion into the rock, Arcadis explained that molecular size is a factor and there would be diffusion into the rock that over time would help cleanup TCE that has diffused into the rock. ARCADIS also noted that the vendor can tailor the mix as needed by mixing in other materials, such as additional lactate, to achieve project objectives.

Regarding the seasonal variations in water levels and apparent shallow high productivity zones observed during the 2010 drilling, ARCADIS noted that quarterly well gauging will be conducted during 2011 to assess the seasonal variations. It is anticipated that the EVO injections would be conducted during periods of seasonal low water elevations. A gravity drain approach would be used which would involve injection of the EVO solution into capped wells. The entire borehole is filled with solution so the solution would enter the formation through all available fractures above and below the water table.

- DEP asked whether other options were considered that might be more aggressive, such as ISCO, hydrofrac'ing, in situ thermal treatment, or surfactants.

ARCADIS noted that ISCO was considered, but it would flush more quickly through the fractures than EVO. In-situ thermal would be difficult to implement in bedrock. Regarding hydrofrac'ing, it was noted that this provides only localized benefit and would be of limited value at this site. Regarding surfactants, ARCADIS indicated that our technical experts have concerns about injecting surfactants in a fast flow fracture scenario. In addition, surfactants would typically be used to address NAPL, but there is no evidence of NAPL at Mid-Valley.

- DEP inquired about the need for microcosm studies. ARCADIS noted that the site is aerobic so we would not expect to see active anaerobe populations until we induce the appropriate conditions. Based on ARCADIS' experience, the microbial colonies will populate as the correct conditions are induced so testing or augmentation is an unnecessary step. DEP inquired about how long it would take to see evidence of microbial growth, and, in the event this is not observed, when other remedial approaches would be considered.

ARCADIS noted that the Remedial Design document would outline specific components of a monitoring program and would be prepared in conjunction with EPA and DEP. As a rule of thumb, evidence of microbial growth would be expected to occur within 6 to 9 months, though this could vary due to site-specific circumstances. A monitoring program would likely include sampling for total organic carbon, dissolved organic carbon (particularly important for an EVO remedy), daughter products (cDCE would be particularly important), iron, methane, and other parameters typical for anaerobic projects.

- DEP stated that it would be important to have goals established. For instance, when would we expect to see daughter products and what would trigger switching to an alternate remedy. ARCADIS noted that daughter products would likely be evident within a year. The monitoring program and objectives would be established in the Remedial Design. Remedy evaluation and protectiveness would be assessed during the established CERCLA 5-year review process. Also, ARCADIS' remedial approach is inherently an adaptive design. Through monitoring and evaluation, the remedial system can be tweaked to achieve the remedial objectives. For instance, injection frequencies, injection locations, and/or solution mixes can be adjusted and tailored based on site-specific observations.
- Based on the discussion, DEP acknowledged the effectiveness of the ERD approach over the less effective pump & treat option; and noted that the ERD option may be acceptable though the monitoring program and other details would still need to be worked out.

Multi-sites FS

There are numerous multi-site documents encompassing 153 individual sites either under review or held up by possible disputable issues. These include:

- The 5-site FS
- The Arcadis 25 Site FS
- The 45 Site FS
- The Non-Lakes FS
- The SHAW 25 Site FS rolls in at PP stage

A discussion reiterating the position of the Army on the potential dispute on CERCLA drivers for actions at the multi-site FS's was held. EPA and DEP noted that a meeting between their management was to be held on 14 March and that a letter summarizing the Army position would be useful prior to that meeting. Bill Roach did not agree that a letter from the Army summarizing its position on LUCs/ARARs would be useful as they were certainly aware of the Army's position and don't need a letter to remind us. The Army noted that despite several years of negotiation at the project level progress toward an agreement had not really be made. If a dispute would be needed to resolve the issue then the compromise agreements made to date, such as hot spot soil removals, cover systems, and referring to the NJDEP SRS as ARAR's when risks were in the acceptable range, could not be continued. It was also noted that the Army did not agree with the EPA's latest position that an Institutional Control (IC) limiting a site to industrial use constituted a CERCLA action that triggered recognition of ARARs. The basis of CERCLA as a risk based program was reiterated by the Army and the EPA/DEP reminded that risks at these sites were within the generally acceptable range. It was also noted that at sites with unacceptable risks CERCLA indicated a risk based approach to clean up with the NJDEP SRS for the *risk drivers* being recognized as chemical specific ARARs and those would be complied with. The following summarizes the discussion.

- The 153 individual sites will be divided into groups of 25 sites. Arcadis noted that this will result in a substantial number of document versions requiring review as they will be broken into 25 Sites per PP and ROD.
- Arcadis summarized the current status of the multi-site documents. The most recent document (25 Site PP) stated that NJDEP SRSSs are ARARs. This was based on a December 2009 compromise agreement designed to break a deadlock, but was contingent on the remedies not changing (e.g., EPA/DEP not requiring more aggressive response actions). A 25 site summary table was provided in December 2010 to clarify the agreements and proposed remedies. Arcadis also reviewed the proposed remedies which include LUCs at all sites and other previously agreed-to measures at certain sites including focused removals and maintenance of existing vegetative covers.
- The Army position remains that CERCLA is a risk based program and ARAR analysis is triggered by unacceptable risk for the current and reasonably anticipated future use. At the sites in question, there are no risks under foreseeable future use scenarios. Therefore, without risks, LUCs would not be legally mandated components of a response action.
- EPA noted they have a different position about this than the Army. EPA and DEP have a meeting scheduled for March 14th to discuss this situation.
- Regarding the 25 sites table, DEP noted that some sites look good and others will need to be “tweaked” a bit. For instance, at the power plant site, dispersed bricks from the building demo shouldn’t be referred to as an appropriate soil cover. Arcadis noted that a requirement for a soil cover in this instance would be a fairly big change. EPA noted that a discussion point at the March 14th meeting will be whether DEP allows existing soil covers across the state and whether this is consistently applied.
- EPA and DEP are concerned about setting a precedent if special exceptions are made at the Installation. All acknowledged, though, that the installation is a controlled facility. This is an important factor that differentiates the installation from private sites.
- DEP stated that the Army’s no risk/no ARAR position wasn’t discussed until soil standards were promulgated; before that time, the Army pointed to the Geiss memo. The agreement was always that the Army would comply with soil standards (even before promulgation) and there would be some sort of engineering control that would satisfy the state’s requirement.
- The Army stated that only risk drivers get remediated, so for a given site the Army would only cleanup the COCs that are driving the risk. EPA expressed a contradictory opinion that once you exceed risk you clean up for all ARARs, not just the risk drivers.
- EPA noted that the March 14th meeting should help EPA/DEP determine their expectations for the path forward. The Army agreed to provide a response to EPA’s recent letter so that the Army’s position is clear and can be appropriately considered during the March 14th meeting. The December 2010 25 sites table clarifies the Army’s position but a follow-up letter and the presentation slides will also be provided to EPA and DEP. The letter will also request a response date. The Army summarized the circular argument that has the team stuck without a plausible path forward. The Army can’t proceed because whether they call it ARAR or don’t call it ARAR, one way or the other, EPA or DEP has issues that affect the Army’s ability to proceed forward.
- Response timeframe: EPA stated that their management is aware that this is a hold up. He expects EPA will aim to address this as quickly as possible. The Army reiterated their urgency and that there are lots of sites tied up in this.

- Looking ahead, the Army asked if the Army will have to prepare additional tables like the December 2010 25 sites table. EPA noted that their management may need it to see what the Army is proposing for these sites so it would be helpful for the Army to provide similar tables.

IAG and DSMOA

- The Army referred to the 2 party federal facility agreement between the Army and EPA. Because EPA is the lead regulatory agency, the Army suggested that all regulatory comments be submitted to the Army through EPA. This would help ensure that the comments provided to the Army are the formal set of comments that require response, while recognizing the informal relationship with DEP. This would clarify the formal role for EPA as the primary regulator. The Army suggested that this would help move more quickly to meet RIP/RC dates. The Army reiterated its commitment to meeting the FFA timeframes and suggested the proposed approach would help EPA/DEP commit to meeting these timeframes as well. The FFA provides an existing framework that should guide the interactions/reviews.

EPA/DEP questioned whether EPA would be expected to review and vet DEP's comments and disagreed with this approach.

- EPA noted that management reviews the key CERCLA documents closely and the process takes time. He also acknowledged that EPA hasn't been complying with FFA timeframes. The Army suggested that EPA circulate internal memos to with Picatinny documents to technical staff conducting the reviews that refer to the Picatinny FFA review timeframes and due dates. EPA agreed to do this.
- Review of the IAG Schedule included repeating the decision to delete annual or other monitoring reports from the Table once the next annual or iteration of the same report was submitted to the agencies.
- Greg Zalaskus noted that he would get the concurrence for Site 78/PICA 78 ROD to EPA very shortly.
- Greg Zalaskus said he was being requested to complete the DSMOA-related semi-annual report for NJDEP in the next few days.
- Ted Gabel asked that EPA and NJDEP review the schedule provided at the meeting for any inaccuracies.

Lakes FS

Sediment sampling has recently been conducted in Picatinny Lake at Site 40 where elevated levels of explosives had been detected in the past. Vertically oriented samples collected at the location of the previously impacted samples indicated the explosive compounds were now either at very low levels (below screening criteria for human health and ecological risk) or absent. Based on these new data Arcadis considers that the interim action to remove sediments at this location is considered now unnecessary.

- EPA asked if there was a possible reason for the change. Arcadis noted that it had been several years since the previous samples were collected, that the lake system was dynamic, that explosives are known to degrade naturally, and that the previous data indicated that the elevated explosives were isolated hot-spots rather than a broad based impacted area.
- EPA and DEP agreed that Arcadis should move forward with a response to DEP comments on the Lakes FS including these new data and the proposal that the Lakes FS be submitted with No Further Action for all three water bodies included in the document.

Area D

A brief discussion was held regarding DEP comments on increasing cis-DCE concentrations. Arcadis pointed out that while cis-1,2 DCE was increasing at one downgradient well, concentrations of total volatiles in the well had substantially reduced since the PRB was installed and that other wells in the area exhibited very low concentrations. Surface water data indicated that the wall continued to be effective.

A discussion regarding the presence of the degradation compound cis-1,2-DCE downgradient of the wall was held. Arcadis speculated that perhaps hydrogen from reactions in the wall was providing impetus for degradation at this location.

It was concluded that the wall is continuing to be effective and that data from the planned future monitoring would be reviewed to ensure the remedy remained effective, and that there was no underflow.

Area E

In response to DEP's comments, Arcadis concurred that increasing concentrations of tetrachloethene (PCE) have been noted at well E-95-3. DEP voiced a concern that there may be a new source at the location. However, it was noted that the underground storage tanks removed from the site, and the original source of contamination, were closed correctly. Also that if a new source was present that concentrations would likely be higher.

It was agreed that in the March 2011 sampling round additional wells in the vicinity would be sampled to further assess the PCE data trends in the area. It was also noted that there were no downgradient impacts from the increasing trend and that this was still the beginning of a 45 year remedy.

The additional data to be collected in March will be presented and discussed at the next technical meeting.

PICA 013

EPA comments on the draft final PICA 013 ROD were discussed. The major concern was that vinyl chloride data trends included in the ROD indicated possible bio-accumulation of the degradation product. Arcadis presented data collected in 2010 that had not been included in the ROD and that data indicated the vinyl chloride was in fact dissipating. EPA agreed that the comment response should include that new data and didn't see a problem moving the ROD forward based on these new data.

Annual Reports

Arcadis reviewed the upcoming schedule of annual reports and Remedial Action Reports.

Five-Year Review

Arcadis noted that the 2011 5-Year review document for Picatinny would be submitted to the EPA in March or April. A potential site visit from EPA to view the subject sites was discussed and EPA indicated that they would probably conduct a site visit following initial review of the document.

Next Meeting:

- Next RAB meeting is on March 3, 2011 at 6:30 PM at the Hilton Garden Inn Rockaway NJ.
- The date of the next technical meeting was not discussed.

Action Items:

Action	Responsible Individual(s)	Due Date
For the multi-site dispute, the Army will provide a position summary letter and the presentation slides in advance of the March 14 th EPA/DEP meeting. Letter will request a response date.	TL/TG	In progress
Let ARCADIS know about a site visit for the 5-yr review and how many copies of the 5-yr review	BR	Complete
Provide a copy of the EDD slide so BR can share this with his EDD person.	AUS	Complete