TECHNICAL BRIEFING – DRAFT FINAL THREE SITES FEASIBILITY STUDY – APRIL 2014

The document reviewed was a Feasibility Study (FS) for PICA-097, -131, and -149 (Sites 118, 131, and 149) which has been informally called the "Three Sites FS."

Background on Sites

All three sites have been the subject of numerous investigations over the years. Contaminants of concern (COCs) for each of the sites are listed later in the report. Surface and subsurface soil are the main media of concern for the sites. Groundwater and/or sediment are being addressed as part of other actions where there are exceedances for the three sites.

Site 118/PICA-097 – Building 41, Pesticide Storage Facility

The small site (0.1 acres) is located in the middle of the golf course and includes Building 41. Building 41 was constructed in 1956 and may have been used for storage. In 1964 the building was turned over to Plant Engineering for storage of fertilizer, lime and other materials. Recent storage has been for pesticides and herbicides. Supposedly there was a roof leak at Building 41 which caused water to enter the building. Furthermore up until 1988 it was reported that the bagged chemicals would leak onto the floor; the leakage of chemicals along with the roof leak provided means for spread of contaminants. After 1988 storage reportedly has been for equipment only. Sediment exceedances are being addressed as part of the Green Pond Brook/Bear Swamp Brook Record of Decision.

Risks/Hazards Summary:

- Carcinogenic risk within generally acceptable risk range of 1E-6 to 1E-4.
- Noncarcinogenic hazard index greater than 1.
- Lead is not a concern.
- Ecological risks considered to be minimal.

Site 131/PICA-131 – Building 266, Former Ordnance Manufacturing

The site is approximately 1.2 acres in area and includes Building 266 which is a former ordnance manufacturing facility originally constructed in 1903 and used until the early 1950s for explosives production. After that the facility was used for wind tunnel research. Groundwater exceedances are being addressed under the Mid-Valley Groundwater FS.

Risks/Hazards Summary:

- Carcinogenic risk greater than 1E-4.
- Noncarcinogenic hazard less than 1.
- Lead is not a concern.
- Ecological risks considered to be minimal.

Site 149/PICA-149 – Propellant Plant (Former Building 541)

Site 149 is located along the shore of Picatinny Lake and is 0.8 acres of forested habitat that formerly contained Building 541 which was demolished in 1983. The building was constructed in 1943 for use in a hardening process for explosive powder grains until the mid-1950s. In the mid-1960s locomotives were stored in the building. At one point a vat in the building ruptured and liquid and contaminants were discharged to the building floor and outside.

Risks/Hazards Summary:

- Carcinogenic risk is greater than the generally acceptable risk range of 1E-4 to 1E-6 for the reasonably anticipated future use of industrial/research worker.
- Noncarcinogenic hazard is at or less than 1.
- Lead is not a concern.
- Ecological risks considered to be minimal.

<u>Remedial Action Objectives</u>

The remedial action objectives (RAOs) for the sites are as follows:

- Address soil with contaminants driving the risk or hazard index for the site greater than 1 E-4 or 1, respectively; and
- Eliminate exposure to soil contaminants to the extent required to reduce the exposure point concentrations below the contaminants respective New Jersey (NJ) Non-Residential Soil Remediation Standard (NRSRS) regardless of whether the contaminant has been designated a risk driver or not.

Contaminants of Concern (COCs)

Constituents listed below in regular type are those contributing to unacceptable risk or human health hazard (greater than 1E-4 to 1E-6 or hazard index greater than 1) under the current and presumed future land-use scenarios. Those shown in bold type exceed the NJ NRSRS.

Site 118/PICA-097 – Building 41, Pesticide Storage Facility: Thallium, manganese, **arsenic**, **lead**, **dieldrin**, and **heptachlor expoxide**;
Site 131/PICA-131 – Building 266, Former Ordnance Manufacturing: Arsenic and polyaromatic hydrocarbons ([PAHS] – **benzo(a)anthracene**, **benzo(a)pyrene**, and **benzo(b)fluoranthene**); and
Site 149/PICA-149 – Propellant Plant (Former Building 541): 2,4-DNT and PAHs (**benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)antracene**, and **indeno(1,2,3-c,d)pyrene**).

Cleanup Goals

The agreement reached by the USEPA and the Army regarding the dispute on applicable cleanup standards is that where "an unacceptable soil risk has been identified for a current or reasonably anticipated future land use, that any NJDEP soil cleanup standard which is promulgated, more stringent than the Federal standard, identified in a timely manner, and is legally applicable or relevant and appropriate, must be attained (or waived) by the remedial action, regardless of whether the contaminant has been designated as a risk driver or not." Prior to the agreement the Army had proposed no action for contaminants exceeding NJDEP soil cleanup standards (if more stringent than Federal criteria) if they were not risk drivers.

COC	**Cleanup Goal (milligrams per kilogram [mg/kg])**
Arsenic	19
Dieldrin	0.2
2,4-DNT	3
Heptochlor epoxide	0.3
Lead	800
Manganese	23,000

PAHs:

Benzo(a)anthracene	2
Benzo(a)pyrene	0.2
Benzo(b)fluoranthene	2
Dibenz(a,h)anthracene	0.2
Indeno(1,2,3-c,d)pyrene	2

Process of Identifying and Selecting Alternatives

Once the RAOs have been formulated and the attainment areas identified, the final steps in the FS are as follows:

- Identify response actions
- Perform initial screening: effectiveness, implementability, and cost
- Perform technology screening
- Develop response action alternatives
- Detailed evaluation of response actions
- Individual analysis of alternatives
- Comparative analysis of alternatives.

Details can be found in the FS. The remedial alternatives and the outcome of the comparative analysis of alternatives are described below.

Remedial Alternatives

- Alternative SL-1 – No Action.
- Alternative SL-2 – Soil Cover with Land Use Controls (LUCs)
- Alternative SL-3 – Asphalt Cover with LUCs
- Alternative SL-4 – Removal, Off-Site Disposal, and LUCs

Remedial Costs

Total costs (present worth) for each of the alternatives are provided below:

- Alternative SL-2 – Soil Cover with Land Use Controls (LUCs)

  Site 118/PICA-097 – $161,000

Site 131/PICA-131 – $154,000

Site 149/PICA-149 - $149,000

Total $464,000

- Alternative SL-3 – Asphalt Cover with LUCs

  Site 118/PICA-097 – $342,000

  Site 131/PICA-131 – $299,000

  Site 149/PICA-149 - $210,000

  Total $851,000

- Alternative SL-4 – Removal, Off-Site Disposal, and LUCs

  Site 118/PICA-097 – $277,000

  Site 131/PICA-131 – $245,000

  Site 149/PICA-149 - $185,000

  Total $707,000

Detailed Analysis

The nine criteria against which each RA has to be assessed are as follows:

Threshold criteria:

1. Protection of human health and the environment.
2. Compliance with ARARs.

Primary balancing criteria:

3. Long-term effectiveness and permanence.
4. Reduction of toxicity, mobility, or volume through treatment.
5. Short-term effectiveness.
6. Implementability.
7. Cost.

Modifying criteria:

8. State acceptance.
9. Community acceptance.

The first seven screening criteria are employed in the FS. State acceptance and community acceptance are factored in during the public comment period. The preferred alternative will be the one that satisfies the first two criteria and best satisfies the remaining seven criteria. In past Picatinny Arsenal reports an RA had been recommended as the preferred alternative in the FS; this practice has been discontinued. Only the detailed analysis is presented in the FS. The no-action alternative does not meet the threshold criterion of protecting human health and the environment. The remaining alternatives satisfy some or all of the first six criteria. Cost is the final balancing criteria.

Comparative Analysis of Remedial Alternatives

The alternatives were compared on the basis of their ability to satisfy the threshold and balancing criteria. Relative ratings of excellent, good, adequate, and poor were assigned and then an overall score was determined. Alternative SL-4 achieved an excellent ranking whereas Alternatives SL-2 and SL-3 achieved a good ranking. Alternative SL-1 could not be given an overall score as it failed for the threshold criteria.

Schedule

It does not appear possible that the remediation can be included in the current ARCADIS contract unless the proposed plan can be put out for public notice and the Record of Decision (ROD) signed by the end of June.