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EMAIL AND COMMENTS FROM U S EPA REGION III REGARDING REVISED RECORD OF  
DECISION FOR SITE 28 NWS YORKTOWN VA  
02/14/2011  
U S EPA REGION III

## Sawyer, Stephanie/VBO

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**Subject:** FW: Site 28 - Review of the Jan 2011 revised ROD  
**Attachments:** EPA review Site 28 draft ROD 2-11.pdf

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**Subject:** Site 28 - Review of the Jan 2011 revised ROD

Attached, please find EPA's comments pertaining to the review of the revised January 2011 ROD for Site 28, located at the NWS-Yorktown NPL site.

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TABLE 1 (CONT.)  
Summary of Previous Studies and Investigations

Previous Study/Investigation	Date	Investigation Activities
Site Screening Process Report for SSA 3, 4, 5, 9, 10, 20, 21, 22, 23, and 24	Baker, 2001	In September 1997, thirteen surface soil, eight surface water, and fifteen co-located surface/subsurface sediment samples were collected to identify the nature and extent of contamination at Site 28 and aid in the completion of a Human Health Risk Screening and Screening-level Ecological Risk Assessment (Figure 3). Samples were analyzed for target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), and TAL inorganics. The <i>analytical results</i> (Ref. 2) indicated potential unacceptable human health risks due to combined exposure to arsenic, iron, and thallium in surface soil. However, because no unacceptable risk was identified to any individual target organ system, it was concluded that adverse human health effects were unlikely. Potential unacceptable risks to ecological receptors were identified due to exposure to inorganics (primarily silver) in surface water and sediment. Based upon these results, a Remedial Investigation (RI) was recommended.
Round One Remedial Investigation Report, Sites 27 through 30	Baker, 2005	Between May and June 2000, thirteen surface soil, five subsurface soil, three groundwater, and eight co-located surface water and surface/subsurface sediment samples were collected to close remaining data gaps and aid in the completion of a Human Health Risk Assessment (HHRA) and a Step 3 Baseline Ecological Risk Assessment (BERA) (Figure 3). The samples were analyzed for TCL VOCs, TCL SVOCs, and TAL inorganics. Based on the <i>analytical results</i> (Ref. 3), potential unacceptable human health risks were identified due to combined exposure to arsenic, iron, and vanadium in surface and subsurface soil and chromium and iron in groundwater. However, because no target-organ-specific contaminant exceeded 1.0 and the concentrations of all contaminants detected in soil and groundwater were below maximum background concentrations, No Action was recommended for these media. Potential unacceptable risks to ecological receptors were identified due to silver in surface soil, sediment, and surface water. Additional sediment and surface water samples from the unnamed tributary were recommended either prior to or as a part of a Step 7 BERA.
Ecological Risk Assessment – Step 7	Baker, 2008	Between November 2006 and March 2007, twenty surface soil and thirty co-located surface/subsurface sediment and surface water samples were collected (Figure 3). Samples were collected along the length of the unnamed tributary downgradient of Site 28 and along a nearby reference reach and analyzed for TAL inorganics. In addition, toxicity tests were conducted on earthworms, frogs, aquatic invertebrates (amphipods), and fish. <i>Analytical results</i> (Ref. 4) indicated that there was no unacceptable risk to ecological receptors; therefore no further investigation and no remedial action were recommended.

\* The documentation listed is available in the AR and provides information used to support the no action determination for Site 28.

**Media-specific screening values** (Ref. 11) for ecologically relevant media (i.e., soil, surface water, and sediment) were established for the assessment based on the USEPA Region 3 Ecological Soil Screening Levels and National Ambient Water Quality standards. Alternate screening values from relevant, peer-reviewed literature were used when values were unavailable or more conservative values were available. **Ingestion screening values** (Ref. 12) for dietary exposures were derived only for contaminants with the potential to bioaccumulate. Ingestion screening values were derived for both chronic No Observed Adverse Effect Level and chronic Lowest Observed Effect Level endpoints. Toxicological information from the literature for wildlife species most closely related to the receptor species was used, where available, but was supplemented by laboratory studies of non-wildlife species (e.g., laboratory mice) where necessary.

Next, based on detected chemical concentrations and established screening values, hazard quotients (HQs) were calculated to characterize the potential for contaminants to pose unacceptable ecological risk using both conservative and more realistic exposure assumptions. HQs represent a ratio of the exposure level to an ecological effect level and are an estimate of potential risk. Maximum, mean (arithmetic and geometric), and 95 percent upper concentration limit concentrations of soil, surface water, and sediment contaminant concentrations were used in this step to estimate potential exposures for the ecological receptors selected to represent the assessment endpoints at Site 28. Contaminants with HQs greater to or equal to 1.0, the level at which receptors are expected to demonstrate adverse reactions to a chemical, were **identified as COPCs** (Ref. 13). These COPCs were then **compared to base-wide and reference reach background concentrations** (Ref. 14) to determine if concentrations of these contaminants were statistically significant from naturally occurring concentrations.

Finally, toxicity tests were conducted on terrestrial (earthworms [*Eisenia fetida*]) and aquatic (fish [*Pimephales promelas*], frogs [*Rana sphenoccephala*] and invertebrate amphipods [*Hyaella azteca*]) indicator species in order to directly evaluate the toxicity and bioavailability of contaminants in soil, surface water, and sediment. The effects of chemical concentrations on organism survival, growth, and/or fecundity were evaluated by placing each organism in lab-controlled microcosms composed of soil and sediment from Site 28, the nearby reference reach, or laboratory prepared reference media over an extended period of time. Surface water was evaluated by running laboratory prepared water over sediment to mimic the contributions of Site sediment to surface water. Laboratory prepared reference media was used as a negative control to ensure that organisms used in the study were in good health prior to the study and not negatively impacted by conditions unrelated to Site media. **Results of the toxicity testing** (Ref. 15) were statistically compared to determine if effects of exposure to Site media were significantly different from the reference reach.

The Step 7 ERA identified several inorganics as COPCs based on calculated HQ, but only silver was retained based on statistically significant exceedances of both base-wide and reference background concentrations in surface water and sediment; no exceedances in soil were identified. Elevated silver concentrations in surface water were only observed in total (suspended) samples. Total surface water samples do not adequately reflect the bioavailability of contaminants detected, as contaminants may be strongly bound to particulate matter suspended in the water and unlikely to pose risk to receptors. In addition, although silver concentrations detected in surface water and sediment exceeded screening criteria, these criteria are not a direct measurement of risk posed to receptors. Toxicity tests conducted on earthworms, frogs, and amphipods found no significant patterns in growth or survival for any receptor group. Toxicity tests conducted on fish indicated instances of reduced growth in study organisms; however, these differences were not found to be statistically significant enough to indicate unacceptable risk. Therefore, no unacceptable risk was identified due to Site surface water or sediment. The Step 7 ERA concluded that exposure to site soil, surface water, and sediment resulted in no adverse effects and; therefore, **no unacceptable risk** (Ref. 16) exists to on-site ecological receptors.

### 3 Responsiveness Summary

The participants in the public meeting included RAB members representing the Navy and VDEQ. Since no one from the public or RAB members outside the Navy and VDEQ attended the meeting, no presentation was made and no questions or concerns were received during the meeting. No meeting transcript was generated of the public attended the meeting. In addition, no written comments, concerns, or questions were received by the Navy, USEPA, or VDEQ during the public comment period.