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Update to Conductorlab Oversight Committee



Agenda

- Current Regulatory Status
- Surface Water Impacts
 - Additional Investigation
 - Proposed Plan
- Pathway to Site Closure
 - Ecological Risk Characterization
 - Sediment
 - Surface Water
 - Human Health Risk Assessment
- Path Forward



Current Regulatory Status

- Site managed under MCP in coordination with MassDEP
- Long and positive history with Agency
- Completed Phase IV and have attained remedial groundwater objectives for TCE (< 50 ppm), and Cr6 (< 3 ppm)
- Groundwater and surface water monitoring and biannual reporting to MassDEP ongoing
- Ongoing monitoring of surface water MassDEP requests next steps for surface water exceedances

Average TCE Concentrations





Average Chromium On-Property





Cr Groundwater Concentrations





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Additional Investigation

- Implemented second phase of additional chromium investigation – April 2018
- Focused investigation around monitoring well CLW-8
 - Closest in proximity to Unnamed Brook
 - New phase supplemented 2017 investigation which did not identify impacts
 - Included 10 borings, 4 temporary wells in vicinity of CLW-8
 - Goal to characterize vertical and lateral extent of any residual impacts contributing to surface water
- Bench scale testing conducted to identify reductants for treatment



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Total Chromium in Soil





Total Chromium in Groundwater





Proposed Plan

- Data from 2018 investigation shows impacts around well CLW-8
- Treatment best approach to address
 - Design and install passive treatment trench
 - Intercepts groundwater
 - Treat Cr6 using zero valent iron (ZVI)
 - ZVI reduces Cr6 to Cr3 less toxic and more stable
- Treatment to be conducted under Release Abatement Measure



Ecological Risk Sampling - Sediment

- Five sediment samples collected along stream including upstream and downstream
- Sampling conducted during period of extended dry weather represents most conservative results
- Chromium in sediment is trivalent (Cr3)
- Hexavalent chromium (Cr6) not detected above 0.32 mg/kg
- Total chromium < MassDEP screening value (110 mg/kg) for four of five samples
- Total chromium at SD-5 (170 mg/kg) furthest downstream
 - nominally above the screening value



Ecological Risk Sampling - Sediment

- SD-5 may be impacted by roadway runoff Mill Street
 - TOC 3.4% indicates some chromium is bound not bioavailable
- Legacy pesticides in background sample SD-5 (DDE, DDT)
- Pesticides would interfere with sediment toxicity tests
- Sediment toxicity testing not necessary based on these conditions
- Condition of no significant risk exists for sediment



Ecological Risk Sampling – Surface Water

- Surface water sampled from same locations used for sediment

 one location adjacent to site, did not provide enough water
- Total Cr and Cr6 above AWQC proximate to site
- Water collected adjacent to site used for toxicity testing on microorganism (*Ceriodaphnia dubia*), did not result in survival or reproduction
- Condition of No Significant Risk <u>not</u> yet achieved for surface water



Ecological Risk Sampling – Surface Water

- Toxicity performed using serial dilutions of most impacted water
 - Resulted in a threshold for ecologically significant effects
 - Indicates that 71 ug Cr6/L would be protective of the aquatic community
 - Use this as a site-specific risk-based target for site closure
- Microorganism used for testing is a very sensitive species
 - Tends to overestimate risks and effects in nature
- Risks characterized under drought flow conditions
 - Conservative worst case scenario
- Another round of testing planned for April 2019
 - To characterize risk under conditions with more representative flow



Human Health Risk – Soil Review/Evaluation

- Preliminary work for Method 3 risk assessment (10⁻⁵ cancer risk limit, HI = 1 limit)
- Adequate sample spatial coverage (horizontal & vertical)
- Most detected chemicals concentrations below Method 1 Standards
 - Industrial/Commercial and Construction

Human Health Risk – Soil Review/Evaluation

- Arsenic is excluded from risk assessment due to presence as background constituent
- Cr6 should not exceed 63 mg/kg
 - Surface soil avg 11 mg/kg
 - Subsurface soil avg 30 mg/kg
- Lead has screening level of 800 mg/kg
 - Surface soil avg 63 mg/kg
 - Subsurface soil avg 32 mg/kg
- VOCs, PAHs not a direct contact exposure concern



Human Health Risk Assessment

- Industrial/commercial workers, construction workers, trespassers
- No residential use to be evaluated (presumed AUL)
- Soil direct contact exposure and inhalation of dust
- Trespasser direct contact surface water sediment in stream
- No drinking water scenario on-site or off-site (GER in place)
- No vapor intrusion evaluation off-site (no complete pathways)
- No vapor intrusion evaluation on-site (no occupied buildings)
 - will identify groundwater concentrations above GW-2 standards (for future consideration in permanent solution statement)
- Comparison of soil and groundwater concentrations to UCLs



Plans for 2019

- Design and install passive treatment trench
 - Continued surface water testing to assess impact
- Second Round Of Ecological Toxicity Testing spring 2019
 - Focus will be surface water
 - Samples collected in spring will represent more realistic conditions
- Continued Reporting to MassDEP

Surface Water Represents Final Hurdle to Closure

Thank You - Questions?

