

Independent Remedial Action Plan
Terrace Height Elementary School, Yakima WA

Prepared by
East Valley School District
and
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with
Environmental Engineering Support from
Washington State Department of Ecology



October 29, 2012

Introduction

This Independent Remedial Action Plan is written for the Terrace Heights Elementary School in accordance with section 137-340-515 of the Washington Administrative Code (WAC). This independent remedial action plan meets the substantive requirements of Model Toxics Control Act (MTCA) as outlined below.

Background

In response to increasing public concerns on lead/arsenic contamination, the 2001 Washington State Legislature requested that Ecology prepare a statewide strategy to address lead and arsenic soil contamination. The project's main focus was on areas with low to moderate levels of lead and arsenic that have been developed into residential neighborhoods, schools, day cares and parks.

The Washington State Department of Ecology adopted a strategy based on the findings and recommendations of the Area-Wide Soil Contamination Task Force [Task Force], a 17-person panel chartered by the Washington State Departments of Agriculture, Ecology, Health, and Community, Trade and Economic Development (the Agencies). The statewide strategy to respond to low- to moderate-level arsenic and lead soil contamination in Washington State is a completed report, **Area-Wide Soil Contamination Task Force Report**, Ross & Associates Environmental Consulting, Ltd., Landau Associates, Inc., Hubbard Gray Consulting, Inc, June 3, 2003.

The Task Force deliberations focused on understanding the nature and extent of area-wide soil contamination, making recommendations about effective, practical, and affordable steps individuals and organizations can take to reduce their potential for exposure to area-wide soil contamination, and on creating an alternate, more streamlined approach under MTCA for properties affected by area-wide soil contamination.

Specifically, the Task Force recommendations and Ecology's strategy for schools affected by area-wide soil contamination include the following actions:

- that property owners implement individual protection measures
- maintain good soil cover in areas where children play
- conduct qualitative evaluations to increase their understanding of where exposure could occur
- test soils where qualitative evaluations indicate the potential for exposure to contaminated soil,
- implement additional protective measures such as installing a geotextile fabric barrier between contaminated soils and surfacing materials in play areas if contamination is found.

Site Description

The Terrace Heights Elementary School (Site) is located in Yakima County in central Washington within the community of Terrace Heights. Based on soil sampling results by Ecology in 2005, the Site has residual lead/arsenic concentrations considered low/moderate and greater than Model Toxics Control Act cleanup levels. The school grounds are routinely used by the school and community for activities.

Contaminants of Concern

The main contaminants of concern at this Site are the toxic metals, lead and arsenic. Long-term exposure to elevated levels of arsenic may cause cancer, whereas, long-term exposure to lead may affect and impair the human nervous system and proper brain function. More information on the short and long-term affects of lead and arsenic can be found online at www.doh.wa.gov/communityandenvironment/contaminants/arsenic.aspx. Ecology has accepted the placement of a geotextile fabric underneath the clean soil as an adequate barrier for the protection of terrestrial and ecological resources for areawide lead and arsenic soil contaminants.

Site Assessment

Site soil sampling completed in April 2012 by GN Northern confirmed Ecology's previous sampling and indicated low to moderate levels of lead/arsenic contamination are present throughout the school grounds. Based on historic aerial photography the Site was known to be an old orchard. Based on this information and subsequent sampling, the soil is contaminated to a minimum depth from approximately 24 to 36 inches.

Independent Remedial Action Plan (IRAP)

The East Valley School District has entered into an interagency agreement with the Department of Ecology to perform an independent remedial action during the construction of the new Terrace Heights Elementary School meeting the substantive requirements of an Ecology cleanup action at the Site. Ecology is providing substantial environmental engineering technical support to facilitate completion of the independent remedial action during the Site's construction.

During the development of the Independent Remedial Action, the following alternatives were considered:

- Institutional controls that warns students and the public not to dig in the area and to wash hands thoroughly.
- Covering contaminated soils with a clean cap and providing institutional controls to prevent unauthorized digging into contaminated soil.
- Removal of the contaminated soil.

Initially, removal of the contaminated soil was the preferred option; however, construction bids were significantly over-budget and several assumptions on the depth and type of soil were incorrect. This plan documents the activities to cover the contaminated soils onsite and limit future human exposure.

Design Elements: The Independent Remedial Action Plan will use the following design elements to ensure protection of public health:

1. An environmental covenant following completion of the independent remedial action requiring protective measures to occur if the cap is breached to perform maintenance activities. An operations and maintenance plan detailing the proper technique and precautions to take in breaching/restoring the barrier.

2. Balance all materials onsite to the extent practicable through balancing cut and fill to meet Site needs. All soils removed from the site shall be disposed at the Terrace Heights landfill.
3. Construction of a protective barrier layer consisting of a minimum 4 ounce geotextile fabric or geogrid, and 8" to 24" of a barrier layer consisting of either/and/or gravel, asphalt, engineering wood fiber, bark/mulch, concrete, soil, and grass turf (sod or hydroseed). See Figure 1.
4. Construction of an irrigation system to maintain the grass turf cover system. The irrigation system, including the irrigation mainline, shall be constructed in clean soil above the geotextile fabric.
5. All tree planting sites shall be a minimum 5' radius, 2' deep clean soil, and underlain with geogrid (Mirafi 8XT or approved equivalent)
6. All small planting/lawn areas shall be a minimum of 12" clean soil underlain with 4 ounce geotextile fabric to facilitate irrigation system placement in clean soil.
7. All large lawn areas shall be a minimum of 8" clean soil underlain with 4 ounce geotextile fabric. Where lateral irrigation lines are placed the clean soil shall be a minimum of 12" depth. The irrigation main line shall be placed at a minimum depth of 16" within a minimum 2' wide fabric-lined, clean soil trench.
8. The project shall be sequenced to minimize the impacted area requiring active dust control measures. The contractor shall submit a remediation plan and schedule that minimizes areas requiring active dust control measures by dividing the property into areas of work coinciding with the 'irrigation zones' and completing each area sequentially.
9. All contaminated soil beneath the playground area shall be removed and a 3" layer of 5/8 minus gravel placed to stabilize the area until the District performs additional construction activities.
10. A temporary fence shall be constructed around the northwest area playfield following completion and release of this area to the general public. The temporary fencing shall remain in place for a period not to exceed 6 months to allow public use of this remediated space.

Permits: None required beyond what has already been completed for the construction of the new school. The SEPA adequately covered the independent remedial action.

Compliance Monitoring:

Compliance monitoring will generally consist of depth measurements of the clean barrier system layers during construction inspection. Laboratory sampling to verify the quality of the clean soil components shall occur prior to acceptance of the material onsite (see Sampling and Analysis). For the playground area only, a minimum of 10 samples shall be taken randomly across the area and an XRF device will be used to analyze the samples; two of the samples with the highest XRF concentration will be submitted to an analytical lab for analysis. The area shall be considered clean if the upper 95% confidence level is below cleanup levels AND all but 10% of the samples are below 20 mg/kg Arsenic and 250 mg/kg Lead AND no single sample exceeds twice the cleanup level. In the event that contaminated soils and clean soils are purposely or inadvertently mixed, all mixed soils shall be less than 7 mg/kg arsenic to be accepted based on 95% upper confidence levels of testing performed.

Sampling and Analysis

Prior to importing topsoil, the topsoil shall be sampled and analyzed prior to acceptance. Soil shall be from a native in-place soil source. A minimum of 10 samples from each native soil source will be taken and analyzed with an XRF by Ecology. Two of the 10 samples will be verified with laboratory analysis at contractor's expense. No laboratory sample is allowed to exceed 5 mg/kg Arsenic and 30 mg/kg Lead. In the event that sampling and analysis is required to be conducted because soils were purposely or inadvertently mixed, a portable XRF will be used to screen a homogenous mix of the soil to be tested with 10% of the highest samples sent to a laboratory for analysis at contractor's expense.

Safety and Health

The Safety and Health Plan for the Site shall comply with Washington State L&I requirements. A contractor following an accepted Health and Safety Plan may consider the site a 'controlled' hazardous waste site for purposes of complying with Washington State L&I requirements. Once the barrier fabric or confining layer is placed, all personnel working above the fabric or confining layer can perform their duties without special hazardous materials training beyond 'awareness level' training. Personnel provided 'awareness level' training shall immediately report any breach of the barrier fabric/confining layer to the supervisor and cease work activities until the breach is corrected. The contractor will be required to provide a specific Safety & Health Plan for the site.