

ADDENDUM NO. 1
SAMPLING AND ANALYSIS PLAN
Groundwater Compliance Monitoring
Eldridge Municipal Landfill Site

Prepared for

City of Bellingham
Public Works Department – Natural Resources
2200 Nevada Street
Bellingham, Washington 98225

Prepared by

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February 23, 2016

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Figure 1 – Groundwater Station Locations

ACRONYMS AND ABBREVIATIONS

City	City of Bellingham
Ecology	Washington State Department of Ecology
HASP	Health and Safety Plan
Herrenkohl	Herrenkohl Consulting LLC
MTCA	Model Toxics Control Act
SAP	sampling and analysis plan
WSDOT	Washington State Department of Transportation

CERTIFICATION

I, Mark J. Herrenkohl, a licensed engineering geologist in the State of Washington, certify that I have reviewed the geosciences portions of this document.

Signature and Stamp of Geologist:



A handwritten signature in black ink that reads "Mark J. Herrenkohl".

Name: Mark J. Herrenkohl

Date: February 23, 2016

1 INTRODUCTION

This document is an addendum to the sampling and analysis plan (SAP) for the Eldridge Municipal Landfill Site (Site) in Bellingham, Washington. It outlines compliance groundwater sampling and testing activities proposed for the Site, activities supplementary to work completed under the SAP dated April 27, 2012 (Herrenkohl Consulting 2012).

This addendum provides specific guidance for field and laboratory methodology that will be followed by Herrenkohl Consulting LLC (Herrenkohl Consulting) and its subcontractors. Herrenkohl Consulting is conducting this work under contract with the City of Bellingham, Public Works Department – Natural Resources (City), with direction from the Washington State Department of Ecology Toxics Cleanup Program (Ecology). The addendum to the SAP was prepared in accordance with a Consent Decree negotiated between the City and Ecology and signed on December 30, 2015 (Document No. 15-2-02409-1).

As described in the Consent Decree, groundwater samples will be collected during the wettest season (December – March) over two years of monitoring (2016 and 2017). The samples will be collected from monitoring wells EML-SB-01, -02, -03, and -04, and analyzed for dissolved arsenic and iron following methods described in the SAP (Herrenkohl Consulting 2012). Standard field parameters (pH, temperature, conductivity, dissolve oxygen, turbidity, and the redox potential) will also be measured during each sampling event.

After the last sampling event is completed, the results will be evaluated to determine if the dissolved arsenic and iron concentrations have reached or are reaching background conditions. Additional sampling, or other steps, may be required depending on the results of that evaluation.

Following this introduction, the document has been organized into four additional sections. Section 2 describes the field and analytical approach for the additional groundwater sampling. Sections 3 and 4 describe the health and safety requirements and handling of investigation-derived waste, respectively. References are presented in Section 5.

Figure 1 is provided after the report text.

2 GROUNDWATER SAMPLING

Groundwater samples will be collected from four site monitoring wells (EML-SB-01, -02, -03, and -04) (Figure 1) during two sampling events. The first groundwater sampling event is scheduled for March 2016. The second groundwater sampling event will be scheduled for February – March 2017.

The groundwater samples will be collected using the procedures described in the SAP with the following addition:

- Redox potential will be added to the measured field parameters during purging and sampling of the wells.

Water level data will be measured for all wells sampled following procedures in the SAP.

2.1 LABORATORY ANALYSES

The groundwater samples collected from the existing monitoring wells will be analyzed for:

- Dissolved arsenic and iron by EPA Method 200.8.

Target reporting limits for each analysis and quality control/quality assurance procedures will be those specified in the SAP (Herrenkohl Consulting 2012).

3 HEALTH AND SAFETY

Herrenkohl Consulting and subcontractor personnel will follow the relevant health and safety procedures provided in the site health and safety plan (HASP) dated June 24, 2011 (Herrenkohl Consulting 2011).

4 INVESTIGATION-DERIVED WASTE

Investigation-derived waste generated during groundwater sampling, including purge water and decontamination water, will be allowed to re-infiltrate into the soils located near the center of the landfill site (in the vicinity of station EML-SB-03) after sampling is complete. This change from the SAP is warranted since much of the landfill material and contaminated soils were removed during the interim action and groundwater concentrations of arsenic and iron are not expected to require special treatment or disposal based on previous measured concentrations¹.

¹ Arsenic and iron concentrations in groundwater measured previously at the site ranged from 1.4 to 17.7 mg/L and 4,230 to 9,320 mg/L, respectively (Herrenkohl Consulting and Integral Consulting 2015).

5 REFERENCES

Consent Decree. 2015. Eldridge Municipal Landfill Site. State of Washington, Department of Ecology, Plaintiff. City of Bellingham, Defendant. Filed by the Whatcom County Clerk on December 30, 2015.

Herrenkohl Consulting. 2012. Sampling and Analysis Plan, Groundwater Site Characterization, Eldridge Municipal Landfill RI/FS, Bellingham, Washington. Prepared for the City of Bellingham, Public Works Department - Engineering, Bellingham, Washington. Prepared by Herrenkohl Consulting LLC of Bellingham, Washington. April 27.

Herrenkohl Consulting. 2011. Health and Safety Plan, Eldridge Municipal Landfill Interim Action, Bellingham, Washington. Prepared for the City of Bellingham, Public Works Department - Engineering, Bellingham, Washington. Prepared by Herrenkohl Consulting LLC of Bellingham, Washington. June 24.

Herrenkohl Consulting and Integral Consulting. 2015. Final Document. Remedial Investigation/Feasibility Study Report, Eldridge Municipal Landfill Site, Bellingham, Washington. Prepared for the City of Bellingham, Public Works Department - Engineering, Bellingham, Washington. Prepared by Herrenkohl Consulting LLC of Lopez Island, Washington and Integral Consulting Inc. of Seattle, Washington. December.

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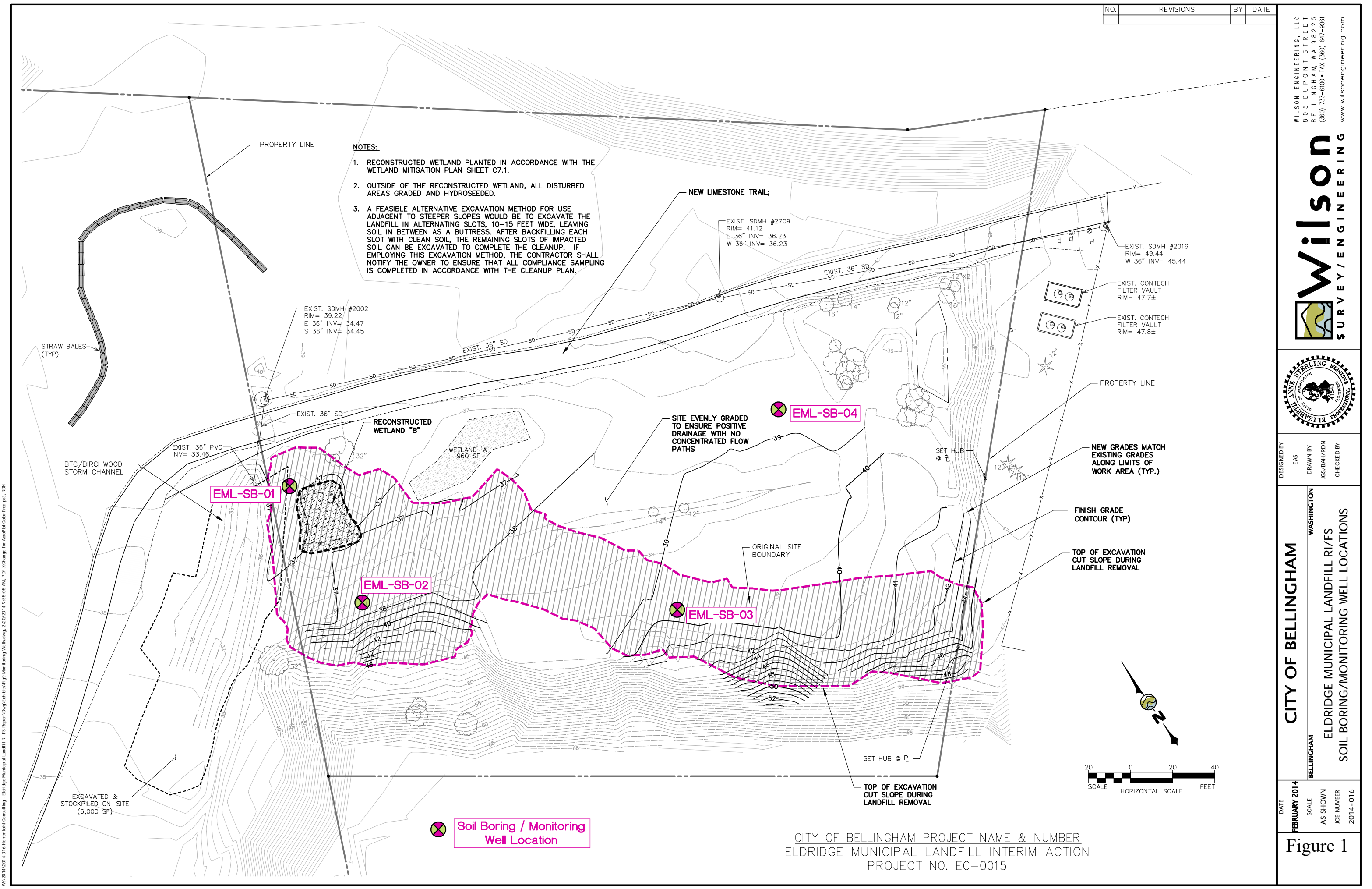
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CITY OF BELLINGHAM
 WASHINGTON
 BELLINGHAM
 ELDRIDGE MUNICIPAL LANDFILL RI/FS
 SOIL BORING/MONITORING WELL LOCATIONS

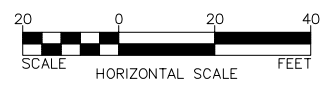
DATE: FEBRUARY 2014
 SCALE: AS SHOWN
 JOB NUMBER: 2014-016

Figure 1

- NOTES:**
1. RECONSTRUCTED WETLAND PLANTED IN ACCORDANCE WITH THE WETLAND MITIGATION PLAN SHEET C7.1.
 2. OUTSIDE OF THE RECONSTRUCTED WETLAND, ALL DISTURBED AREAS GRADED AND HYDROSEEDED.
 3. A FEASIBLE ALTERNATIVE EXCAVATION METHOD FOR USE ADJACENT TO STEEPER SLOPES WOULD BE TO EXCAVATE THE LANDFILL IN ALTERNATING SLOTS, 10-15 FEET WIDE, LEAVING SOIL IN BETWEEN AS A BUTTRESS. AFTER BACKFILLING EACH SLOT WITH CLEAN SOIL, THE REMAINING SLOTS OF IMPACTED SOIL CAN BE EXCAVATED TO COMPLETE THE CLEANUP. IF EMPLOYING THIS EXCAVATION METHOD, THE CONTRACTOR SHALL NOTIFY THE OWNER TO ENSURE THAT ALL COMPLIANCE SAMPLING IS COMPLETED IN ACCORDANCE WITH THE CLEANUP PLAN.



Soil Boring / Monitoring Well Location



CITY OF BELLINGHAM PROJECT NAME & NUMBER
 ELDRIDGE MUNICIPAL LANDFILL INTERIM ACTION
 PROJECT NO. EC-0015

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