

APPENDIX G

FORMER BURN PIT AREA EXCAVATION LIMITS
REEVALUATION



Cem Gokcora

From: Cem Gokcora
Sent: Friday, August 28, 2020 7:45 AM
To: MCDONNELL Erin
Cc: Erik Bakkom (ebakkom@maulfoster.com); 'PARRETT Kevin'
Subject: AMCCO Burn Pile Excavation Boundary Reevaluation
Attachments: Dike Excavation Analysis.pdf

Good morning Erin,

We provided to you yesterday the series of drawings for the burn in which GSI (Rod Struck) evaluated the extent of hotspot and source control screening level exceedances for multiple contaminants and at multiple depths. Figure 10 summarizes the overall extent of excavation based on a compilation of these figures, which was incorporated into the final ROD figures. As discussed during our call, AMCCO wishes to reduce the size of the source control area excavation on the dike based on the analysis that is bulleted below. This revision is suggested as AMCCO optimizes their remaining project funding to prioritize tasks that result in the highest environmental benefit. Erik and I have prepared the following analysis for your consideration.

Basis for current shallow excavation boundary

1. On Figure 7a, GSI identified the extent of a 2-foot depth Burn Pit excavation boundary which addresses source control risk based on copper shown as a yellow boundary.
2. The red boundary identifies a much smaller area where arsenic exceeds source control or hotspot criteria (see Figure 5a for arsenic details in shallow soil).
3. RI sampling results for these upland samples were screened against the sediment clean up levels, as described in bullet two of the drawing notes.
4. The pathway of concern is the erosion of soil directly to the Lewis & Clark River sediment.

Erosion risk evaluation

5. Analysis of the physical erosion risk was not performed at the time, so the basis for excavation assumes that soil exceeding sediment cleanup levels on the levee face will erode en masse and be deposited directly in the sediment bed without dispersion or mixing, a highly unlikely situation.
6. The physical erosion risk of all soil on the face of the existing dike is very minimal due to the dense vegetative cover that is required by the Corp of Engineers.
7. The vegetative cover is maintained rigorously by the local Diking District as part of their dike maintenance responsibilities to the residents of the district and as mandated by their operational agreements with the Corps.

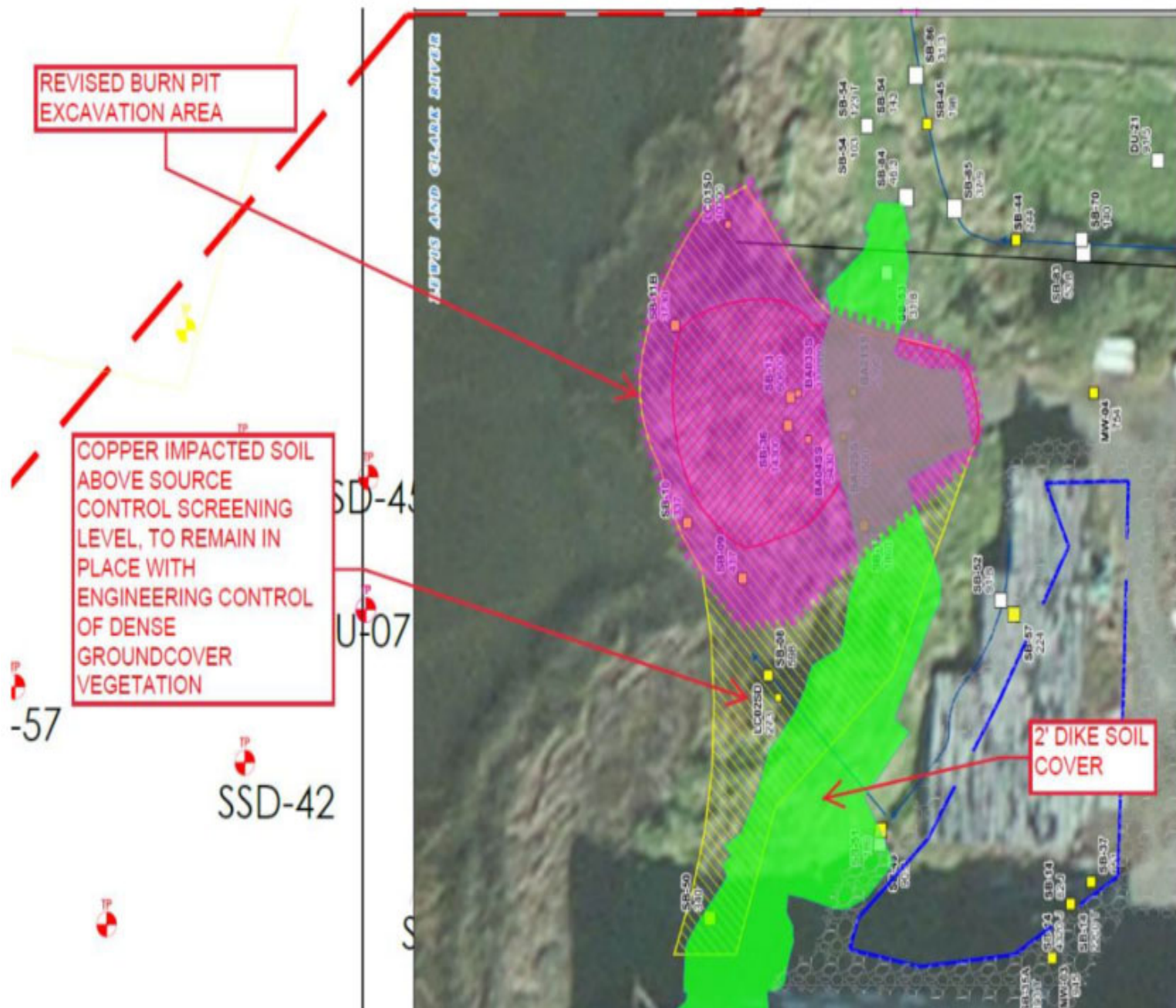
Dike Considerations

8. The dike restoration design is required to provide 2-3 feet of additional fill in order to restore the originally authorized height (area shown in green below).
9. Dike fill on the crest road provides an engineering control that will cap any low-level soil contamination that remains in place.
10. To be considered, the removal of surface soil from the dike and revegetation will result in a period of elevated risk to residents while the grass cover is re-establishing significant root structures. Limiting the disturbance of the protective dike vegetation systems will reduce the short-term risk of dike failure.

Discussion

11. The source control risk is from copper only, there are no other contaminants at levels of concern that are identified in the drawing set prepared by GSI.
12. The hotspot concentration that is established for copper is 120,000 mg/kg, and the source control concentration that is used in the figure analysis is 149 mg/kg.

13. AMCCO proposes to leave in place in the southern portion of the shallow excavation, where copper concentrations are below 1,000 ppm, more than two orders of magnitude lower than the upland hotspot concentration.
14. Soil in the area to remain in place will be fully covered by an engineering control consisting of dense vegetative soil cover that physically limits erosion of surface soil.
15. Dense vegetative soil cover is required to be maintained on the face of the levee while the diking district is inhabited, under agreement between the Diking District and the Corps.
16. If erosion of levee surface soil to the waterway was to occur, though very unlikely, the two foreseeable scenarios do not present unacceptable environmental risk of exposure:
 - a. Erosion that occurs over a significant length of time within the grass-cover root mass where reduction in concentration would occur due to the dispersion of a limited soil mass on an annual basis, or
 - b. Erosion that occurs under extreme flow conditions on the Lewis & Clark where significant reduction in concentration would occur due to significant mixing and dispersion away from the site that results from a flood of this nature. Levee vegetation standards are designed to withstand very significant flood flows. Floods in this area are not high energy, and are typically very stagnant due to the discharge into the Columbia River.
17. An area of 5,400 SF of copper impacted soil is proposed to be left in place, approximately 500 CY.
18. After accounting for cover by the dike crest road, approximately 3,000 SF of copper impacted will be addressed by an engineering control of dense vegetative ground cover.
19. Assuming an average cost of between \$50 and \$75/CY to excavate, relocate, purchase dike fill soil, compact dike backfill soil, provide geotechnical compaction/CQA, and re-establish vegetative seed mix, the avoided project cost is between \$25,000 and \$37,000.
20. Because the environmental risk from soil with low levels of copper impacts can be readily controlled from an erosion perspective with ground covers, and because in-water remedial work has exceeded the planned budget, the avoided expense will preserve more of the settlement funding for remedial elements that have a higher environmental risk in upland areas.



Please see attached figures supporting the reevaluation of the excavation boundary and let us know if you have any questions.

Thank you,

CEM E. GOKCORA PE | MAUL FOSTER & ALONGI, INC.

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I'm working from home in response to COVID-19. Maul Foster & Alongi, Inc. is fully operational and responsive to all projects. Please note there may be a delay if you send hard copy mail to our offices. We are happy to connect with you via email, phone, or videoconference at this time.



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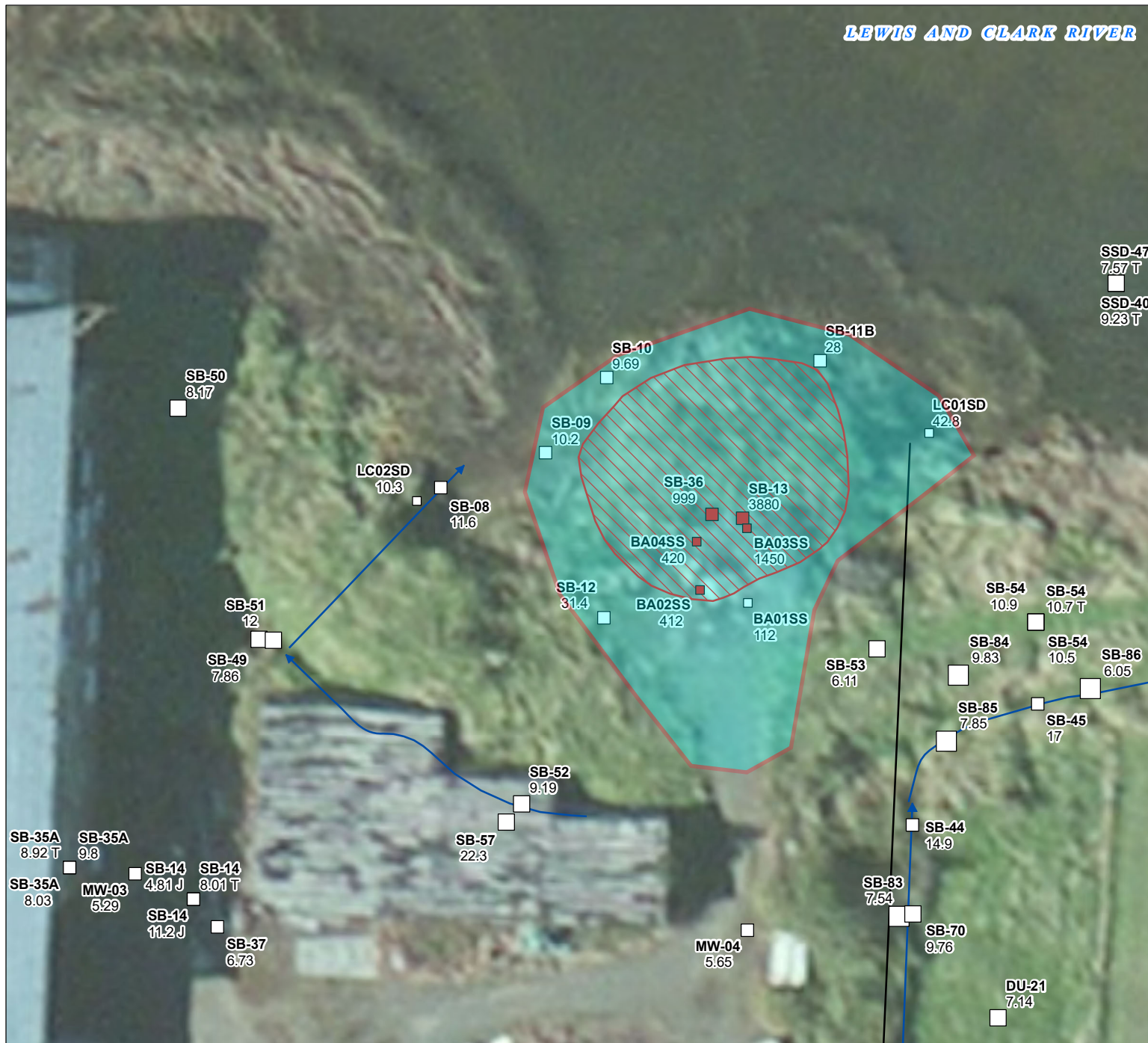


FIGURE 4a

**Arsenic Hot Spot Results
in Surface Soil, 0-1' bgs**
 Astoria Marine Construction
Company (AMCCO)
Remedial Design/Remedial
Action Work Plan

LEGEND

Planned Arsenic Hot Spot
Excavation 0-2' bgs

Soil Sample

Supplemental RI
 Phase 2 RI
 Phase 1 RI
 EPA

Arsenic Concentration (mg/kg)

0-170
 >170, Site Specific Hot Spot
Concentration

All Other Features

AMCCO Upland Boundary
 Surface Drainage Ditch

**Revised 0-2'
Excavation Extent
(Proposed)**

NOTE:

- Concentrations outside the excavation area
represent residual soil concentrations.



MAP NOTES:

Date: June 1, 2016
 Data Source: Aerial Photo from NAIP 2014







FIGURE 6a

**Copper Results
in Surface Soil, 0-1' bgs**
 Astoria Marine Construction
 Company (AMCCO)
 Remedial Design/Remedial
 Action Work Plan

LEGEND

Planned Excavation to Address
 Arsenic Hot Spot/Source Control
 0-2' bgs (See Figures 4a and 5a)

Soil Sample

Supplemental RI
 Phase 2 RI
 Phase 1 RI
 EPA

Copper Concentration (mg/kg)

0-120,000
 >120,000, Site Specific Hot Spot
 Concentration

All Other Features

AMCCO Upland Boundary
 Surface Drainage Ditch

**Revised 0-2'
Excavation Extent
(Proposed)**

NOTES:

- Excavation in this area is required due to the Arsenic hot spot.
- Site specific source control concentrations are based on Preliminary Sediment Remediation Goals presented in DEQ's April 2016 Staff Report.
- Concentrations outside the excavation area represent residual soil concentrations.



MAP NOTES:

Date: June 1, 2016
 Data Source: Aerial Photo from NAIP 2014





FIGURE 7a

Copper Source Control Screening Results in Surface Soil, 0-1' bgs

Astoria Marine Construction Company (AMCCO)
Remedial Design/Remedial Action Work Plan

LEGEND

Planned Excavation to Address

- Arsenic Hot Spot/Source Control 0-2' bgs (See Figures 4a and 5a)
- Copper Source Control 0-2' bgs

Soil Sample

- Supplemental RI
- Phase 2 RI
- Phase 1 RI
- EPA

Copper Concentration (mg/kg)

- 0-149
- >149, Site Specific Source Control Concentration

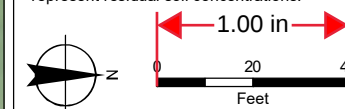
All Other Features

- AMCCO Upland Boundary
- Surface Drainage Ditch

Revised 0-2' Excavation Extent (Proposed)

NOTES:

- Excavation in this area is required due to the Arsenic hot spot/source control.
- Site specific source control concentrations are based on Preliminary Sediment Remediation Goals presented in DEQ's April 2016 Staff Report.
- Concentrations outside the excavation area represent residual soil concentrations.



MAP NOTES:

Date: June 1, 2016
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FIGURE 9a

Lead Source Control Screening Results in Surface Soil, 0-1' bgs

Astoria Marine Construction Company (AMCCO)
Remedial Design/Remedial Action Work Plan

LEGEND

Planned Excavation to Address

- Arsenic Hot Spot/Source Control 0-2' bgs (See Figures 4a and 5a)
- Lead Source Control 0-2' bgs

Soil Sample

- Supplemental RI
- Phase 2 RI
- Phase 1 RI
- EPA

Lead Concentration (mg/kg)

- 0-128
- >128, Site Specific Source Control Concentration

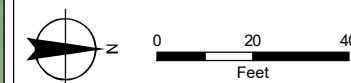
All Other Features

- AMCCO Upland Boundary
- Surface Drainage Ditch

Revised 0-2' Excavation Extent (Proposed)

NOTES:

- Excavation in this area is required due to the Arsenic hot spot.
- Site specific source control concentrations are based on Preliminary Sediment Remediation Goals presented in DEQ's April 2016 Staff Report.
- Concentrations outside the excavation area represent residual soil concentrations.



MAP NOTES:

Date: June 1, 2016
Data Source: Aerial Photo from NAIP 2014





LEWIS AND CLARK RIVER

FIGURE 10

Area to be Excavated
Astoria Marine Construction
Company (AMCCO)
Remedial Design/Remedial
Action Work Plan

LEGEND

**Planned Hot Spot/Source
Control Excavation Area**

-  0-2' bgs
-  0-4' bgs
-  0-7' bgs

All Other Features

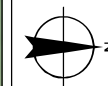
-  AMCCO Upland Boundary
-  Surface Drainage Ditch

 **Revised 0-2'
Excavation Extent
(Proposed)**

 **0-4' Excavation also
required**

NOTES:

- Excavation in this area is required due to the Arsenic hot spot.
- Excavation also addresses arsenic, copper and lead concentrations above site-specific source control concentrations.



0 20 40
Feet

MAP NOTES:

Date: May 31, 2016
Data Source: Aerial Photo from NAIP 2014

