



February 24, 2021
Project No. 8014.01.76

Alex Liverman
Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
Portland, Oregon 97232

Re: Annual Site Activity Summary Report—2020
Zidell Waterfront Property, 3121 SW Moody Avenue, Portland, OR
ECSI No. 689

Dear Ms. Liverman;

On behalf of ZRZ Realty Company, Zidell Marine Corporation, and Tube Forgings of America, Inc. (collectively referred to in this document as Zidell), Maul Foster & Alongi, Inc. (MFA) has completed an assessment of the overall condition of the Zidell Waterfront Property (site) upland, bank, and in-water remedy. Remedy monitoring and reporting requirements are referred to from the Environmental Management Documents letter,¹ including the site Operations, Monitoring, and Maintenance Plan (OMMP)² and the Upland Site Management Plan (SMP).³ The assessment included a compilation of information pulled from multiple inspection reports provided by various inspection parties. The reporting period for this submittal is the 2020 calendar year, for which required monitoring included upland cap visual inspection and visual inspection of the bank and shore.

SITE CONSTRUCTION

No construction activities were performed at the site in 2020.

INSPECTIONS AND MONITORING

Site inspections and monitoring were completed to record conditions of the bank, sediment, and upland caps and to comply with regulatory requirements. The following events were completed in the calendar year:

¹ MFA. Letter (re: environmental management documents, Zidell waterfront property [ECSI No. 689]) to M. Novak, Oregon Department of Environmental Quality, from E. Bakkom, Maul Foster & Alongi, Inc., Portland, Oregon. April 24, 2018.

² MFA. Bank and sediment remedy operations, maintenance, and monitoring plan, Zidell waterfront property, Portland, Oregon. Maul Foster & Alongi, Inc., Portland, Oregon. June 12, 2013.

³ MFA. Zidell upland site management plan, 3121 SW Moody Avenue, Portland, Oregon, ECSI 689. Maul Foster & Alongi, Inc., Portland, Oregon. February 27, 2018.

- The landscape contractor inspected riverbank vegetation to prepare for growing-season landscape-management planning.
- MFA completed the annual site inspection during the third quarter, consistent with previous years. Conditions encountered during the annual inspection were compared to the previous monitoring report conditions to identify changes and progress at the site. Inspections and reporting were completed consistent with the requirements of the site OMMP and the SMP. The inspection noted the following:
 - Bank vegetation above elevation of 16 feet is very dense along the slipway reach. A gap in the vegetation immediately above the top of the rock armor was noted, but there was no significant erosion of the soil cap. A vegetation gap immediately above the top of the rock armor was observed in the south bridge reach (at the transition to the slipway). Vegetation in the middle bridge reach and north bridge reach was generally dense above the top of the rock armor. Vegetation coverage is dense above an elevation of 10 feet in most areas along the downstream reach. Vegetation on the bank area underneath the Tilikum Crossing bridge envelope is moderate and has localized spots of minor erosion where water drips from the overhead bridge structure. The 2018 repair areas are well established and stable, and live stakes installed on lower portions of the bank have become established. Overall, vegetative coverage is good.
 - New or increased bank cap thinning and/or erosion was noted in the downstream reach at several locations north of the Tilikum Crossing. Erosion was identified between elevations of 10 to 15 feet. Existing dense vegetation (e., willows, shrubs) is maintaining some stability. Rock armor appears to be in good shape, with little movement. Rock armor that was placed in 2018 repair areas appears to be in good condition and is stable. Habitat gravel on the repair areas has remained on top of the repair areas.
 - The greenway cap south of the slipway is smooth, with no visible erosion. The greenway cap to the north of the slipway is generally smooth with no visible erosion. Grass vegetation is generally well established, with areas of thinner coverage to the north of the Ross Island Bridge. Site activity resulted in some spots of bare soil, but there was no visible erosion. Grass growth is sufficient with sporadic bare spots from STA 11+50 to the Tilikum Crossing. Coverage is good going north of the Tilikum Crossing to STA 21+50, then less dense with bare spots again further north.
 - The sediment cap is in good condition. Sediment accumulation was observed in the slipway, in the shallow areas of the cap beneath the Tilikum Crossing, and over flat portions of the downstream reach cap. Habitat gravel continues to remain generally in place with minor shoaling from tidal influence and waves.

No additional areas of exposed rock armor are visible compared to the 2019 site inspection.

- The upland cap, west of the greenway, is in good condition. No changes to the asphalt or gravel caps were observed. The barge building interior is secured and was not accessible during the inspection.
- Irrigation has continued during summer months on the bank below elevation of 18 feet throughout the downstream reach, helping to maintain growth and vegetative coverage. Live stakes planted in fall of 2018 on the lower bank in the downstream reach appear to be growing well at most locations.
- The stormwater infiltration facility has dense growth along its slopes and bottom. The interior of the facility is not accessible due to vegetation density.

SITE MAINTENANCE

Maintenance activities on the Zidell site were focused on vegetation management and consisted of the following:

- Weeding was periodically performed by Zidell's landscape contractor to manage invasive vegetation. Zidell treated and/or removed butterfly bush, thorn apple, and Himalayan blackberry.

SAMPLING

Samples to assess environmental performance of the remedy were not required in 2020.

No work related to institutional controls was performed at the site in 2020.

OTHER SITE ACTIVITY

Zidell continues to monitor the establishment of camps (by homeless persons or transients) on the site and has cleaned up several camp areas in coordination with the City of Portland police department, neighboring property owner Oregon Health & Science University's security department, and the Oregon Department of State Lands (DSL). The DSL 2018 notice of camping ban on the state's property has been an effective enforcement tool, allowing Zidell to post trespassing notices and have campers removed from the site.

2021 PLANNED ACTIVITIES

The following activities are planned for 2021:

- Weeding and vegetation maintenance
- Monitoring of downstream reach topsoil thinning/erosion

- Bathymetric survey
- Habitat substrate (gravel) monitoring
- Natural recovery monitoring
- Visual cap and bank armor inspection
- Annual site inspection
- Annual assessment report
- Possible bank repair below elevation 18 feet in areas of continued erosion below and downstream of the Tilikum Crossing.

SUMMARY

The bank, sediment, and upland caps are in good condition. Repair work completed in 2018 is stable and well vegetated. Additional monitoring will be performed for thinning topsoil areas in the downstream reach to assess the need for bank repair and stabilization in 2021 or later.

Sincerely,

Maul Foster & Alongi, Inc.



Jacob Faust, PE
Senior Engineer



Erik Bakkom, PE
Principal Engineer

Attachments: Limitations
Figure
2020 Annual Site Inspection Summary

cc: Kathryn Silva, Zidell Companies
Alan Park, Zidell Companies

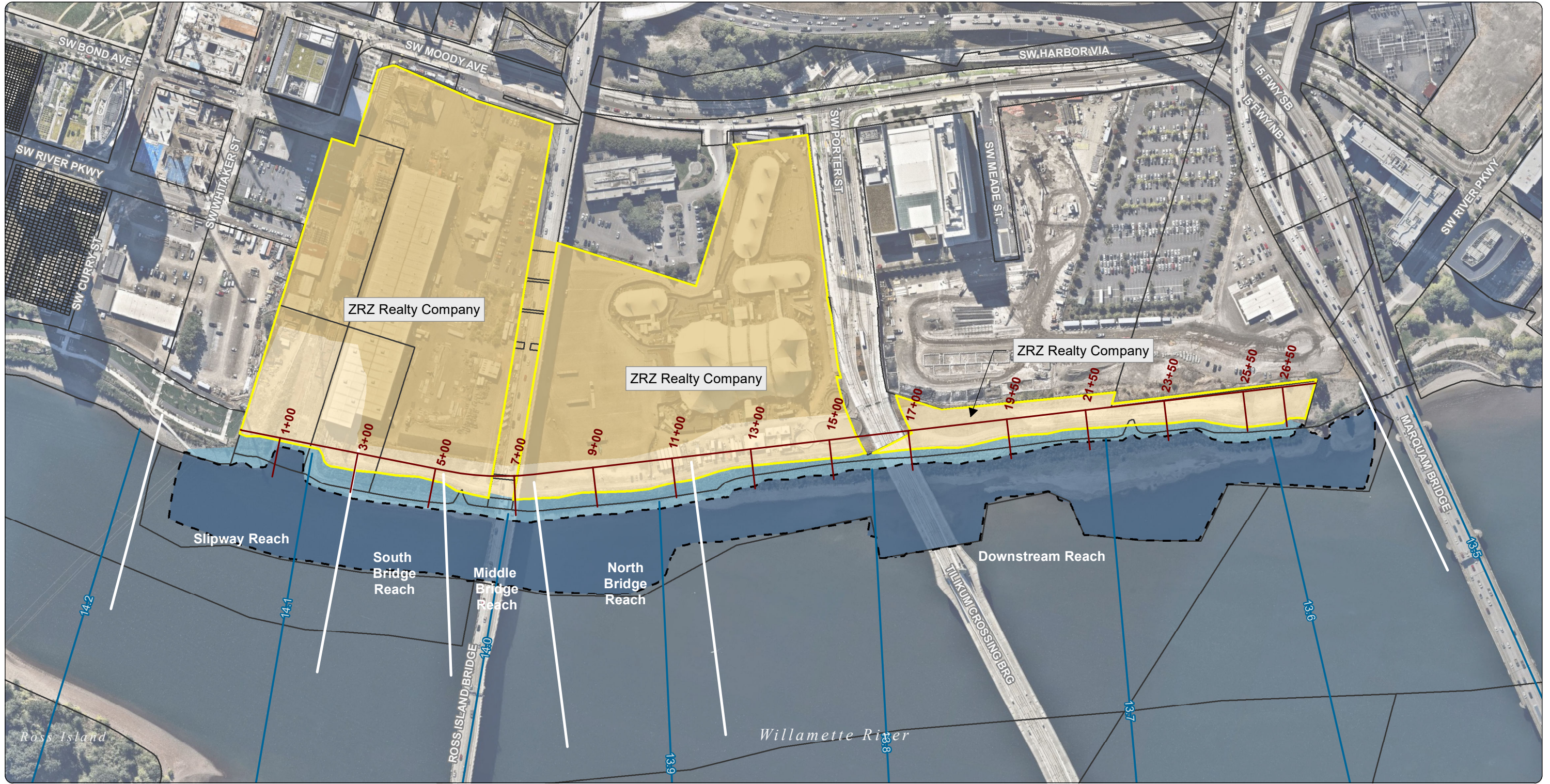
LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

FIGURE





Source: Aerial photograph obtained from Mapbox;
property boundary obtained from
survey (2011) conducted by Olson Engineering;
river miles are based on the FEMA Current
Effective Model.



This product is for informational purposes and may not have been prepared for, or be suitable
for legal, engineering, or surveying purposes. Users of this information should review or
consult the primary data and information sources to ascertain the usability of the information.

Legend

- Sediment Cap Area
- Greenway Bank Area
- Greenway Upland Area
- Non-Greenway Upland Area
- Cap Boundary
- Monitoring Station
- River Mile
- Tax Lot Boundary
- ZRZ Realty Company Property Boundary

Figure
Site Features
ZRZ Realty Company
Portland, Oregon



ATTACHMENT

2020 ANNUAL SITE INSPECTION SUMMARY





MEMORANDUM

To: Kathryn Silva, ZRZ Realty
Alan Park, ZRZ Realty

Date: February 24, 2021
Project: 8014.01.76

From: Jacob Faust, PE

RE: 2020 Annual Site Inspection Summary

Maul Foster & Alongi, Inc., has prepared this monitoring event memorandum to provide the project team with a summary of observations for the October 1, 2020, inspection of the 3121 SW Moody Avenue property. This report was prepared according to the parameters summarized in the site Operations, Monitoring, and Maintenance Plan (OMMP)¹ and the Site Management Plan (SMP).²

SUMMARY OF FIELD ACTIVITIES

Visual monitoring was completed for the bank cap, visible (i.e., above water) near-shore sediment cap, and upland caps. The performance criteria described in the OMMP and the SMP were used as a basis for observation and recording. Bank and sediment cap observations are referenced spatially to the bank and sediment cap baseline alignment, and upland cap observations are logged with descriptions of existing site features (see the attached figure). All elevations described in this document refer to the City of Portland vertical datum. Photographs taken to catalog observations and general views of the site are attached to this memorandum.

¹ MFA. Operations, monitoring, and maintenance plan. Maul Foster & Alongi, Inc., Portland, Oregon, June 12, 2013.

² MFA. Site management plan. Maul Foster & Alongi, Inc., Portland, Oregon, January 31, 2018.

OBSERVATION SUMMARY

Details, including site conditions, of this monitoring event are as follows:

Inspectors	Jacob Faust, PE; Erik Bakkom, PE
Quarter and Inspection	Annual Site Inspection
Date	Tuesday, October 1, 2020
Time	12:00 p.m.–4:00 p.m.
River Elevation (beginning–end)	4.1'–5.1' (City of Portland Vertical Datum)
Weather	Sunny/clear, 74° Fahrenheit, wind SE 4–6 mph
NOTES: mph = miles per hour. SE = southeast.	

A photographic log of this inspection event is attached.

Slipway Reach (STA: 0+00 to 3+00)

Greenway Cap

The Greenway Cap in the south slipway is smooth, with no visible erosion exceeding performance criteria. Most of the grass is dense, providing approximately 100 percent³ coverage.

Slipway Ramp

The ramp area is in generally good condition. Gravel cover is consistent, with some minor shifting occurring in the lower elevations above the Type C rock armor (elevation above 5 feet). Ground cover vegetation has established in upper elevations, and woody debris is scattered throughout. Sedimentation is visible over the in-water portions of the ramp.

One small area of reactive core mat (RCM) (approximately 6 to 8 square feet) is visible adjacent to the center rail at the upper edge of the constructed limit. Since the RCM is still well anchored, this condition does not appear to be an issue. The condition will be evaluated in 2021 to determine if repair action (e.g. gravel placement/raking) is warranted.

Bank Vegetation

Bank vegetation above elevation of 16 feet as well as beneath the barge building is very dense. Overall, vegetative coverage is good.

Bank Condition

No significant erosion was observed on the bank. Some bank armor near STA: 0+20 is mounded up over the lower bank; it appears that this is caused by human activity. There are some minor vegetation

³ The inspector uses visual observation to qualitatively estimate coverage percentages. No quantitative measurements were taken during this inspection.

gaps along the lower bank from STA: 0+00 to 0+25; however, erosion is minimal and the bank appears stable.

Sediment Cap Condition

The sediment cap is in generally good condition; sediment buildup was observed in the slipway.

South/Middle Bridge Reach (STA: 3+00 to 7+00)

Greenway Cap

The Greenway Cap vegetation was short but provided approximately 85 to 90 percent coverage. Recent site activity had resulted in some spots of bare soil and ponding water. There was no notable surface erosion, as drainage is directed away from the top of bank.

Bank Vegetation

Bank vegetation above elevation of 16 feet is very dense. A vegetation gap immediately above the top of the rock armor was observed in the South Bridge Reach, but was not evident in the Middle Bridge Reach. Vegetative coverage is good.

Bank Condition

Bank armor that was placed during the 2018 repair is in good condition, with no erosion observed. Vegetation has become established. Minor areas of bank erosion were observed between elevations of 15 and 18 feet in areas corresponding to the edge of the Ross Island Bridge.

Sediment Cap Condition

Sediment cap condition is generally good, with no erosion or other visible changes observed.

North Bridge Reach (STA: 7+00 to 11+50)

Greenway Cap

The Greenway Cap vegetation was short and provided approximately 75 to 80 percent coverage in the North Bridge Reach. Recent site activity (public events) had resulted in some spots of bare soil and ponding water, but there was no visible erosion.

Bank Vegetation

Bank vegetation above elevation of 15 feet is very dense.

Bank Condition

No new bank erosion was observed above the top of the rock armor. Rock armor, including 2018 repair areas, appears to be in good shape, with little movement or change compared to the 2019 site inspection.

Sediment Cap Condition

The sediment cap condition is generally good, with no erosion or contour changes observed. Sedimentation was observed at the toe of bank slope.

Downstream Reach (STA: 11+50 to 27+00)

Greenway Cap

Grass growth is decent from STA: 11+50 to the Tilikum Crossing (approximately 70 to 75 percent coverage). Coverage is good from north of the Tilikum Crossing to STA: 21+50, then less dense again going north to STA: 24+00, then dense again.

Bank Vegetation

Vegetation coverage is dense above elevation of 10 feet in most areas. Vegetation on the bank area below the Tilikum Crossing bridge envelope is compromised by shading and/or lack of water; localized spots of minor erosion are visible where water drips from the overhead structure. 2018 repair areas are revegetating vigorously through the newly placed rock armor, and live stakes installed on lower portions of the bank have become established.

Bank Condition

The bank appears to be in good shape above elevation of 10 feet up to STA: 19+50. Lower bank erosion has been noted from STA: 19+50 to 26+00 at various locations (approximately 60 percent of the bank line) from elevation 11 feet to 18 feet, as shown in the photo log. 2018 repair areas appear to be stable, with vegetation well-established. Habitat gravel on the repair areas appears to have remained on top of the rock armor.

Sediment Cap Condition

The sediment cap condition appears consistent with the previous inspection, with no notable changes. Significant sedimentation was observed over the shallow portions of the cap beneath the Tilikum Crossing. North of the Tilikum Crossing, ground cover vegetation extends over the habitat gravel, down to approximate elevation 8 feet.

Upland Cap Observations

The gravel cap appears in good condition. No changes to the asphalt cap were observed. Equipment and materials were removed from the operational areas following closing of barge building operations. The barge building interior is secured and was not accessible during the inspection.

Other Observations

- Live stakes planted in fall 2018 on the lower bank in the Downstream Reach appear to be growing well at most locations.
- The test vegetation plot in the Middle Downstream Reach is very dense and well established.

- The stormwater infiltration facility has dense growth along its slopes and bottom.
- Minimal discharge from City of Portland outfall 07b (near the Marquam Bridge) was observed. Discharge appeared to be murky, with bubbles, sediment, and discoloration.
- Debris (trash, clothing, etc.) from vagrant activity was observed at various locations on the bank; however, as a result of increased monitoring and security measures, the site is cleaner than during the 2019 inspection.

RECOMMENDATIONS

The following recommendations should be considered for maintenance and monitoring of the caps:

- Bank repair below elevation 18 feet is recommended in areas of continued erosion north of the Tilikum Crossing. The 2018 bank repair continues to be effective, and each inspection conducted since then has found successive increases in vegetative establishment.
- Monitor erosion areas above the rock armor beneath the Ross Island Bridge. The bank appears stable; however, additional erosion would be detrimental to cap stability.
- Continue to monitor vegetation on the lower bank areas of the Downstream Reach. Irrigation of the bank vegetation, primarily newer plantings, should continue during dry periods in summer and fall.
- Monitor the small, exposed RCM area in the slipway. If gravel displacement continues, raking or placement of additional gravel may be required.

Attachments: Limitations
Figure
Photographic Log

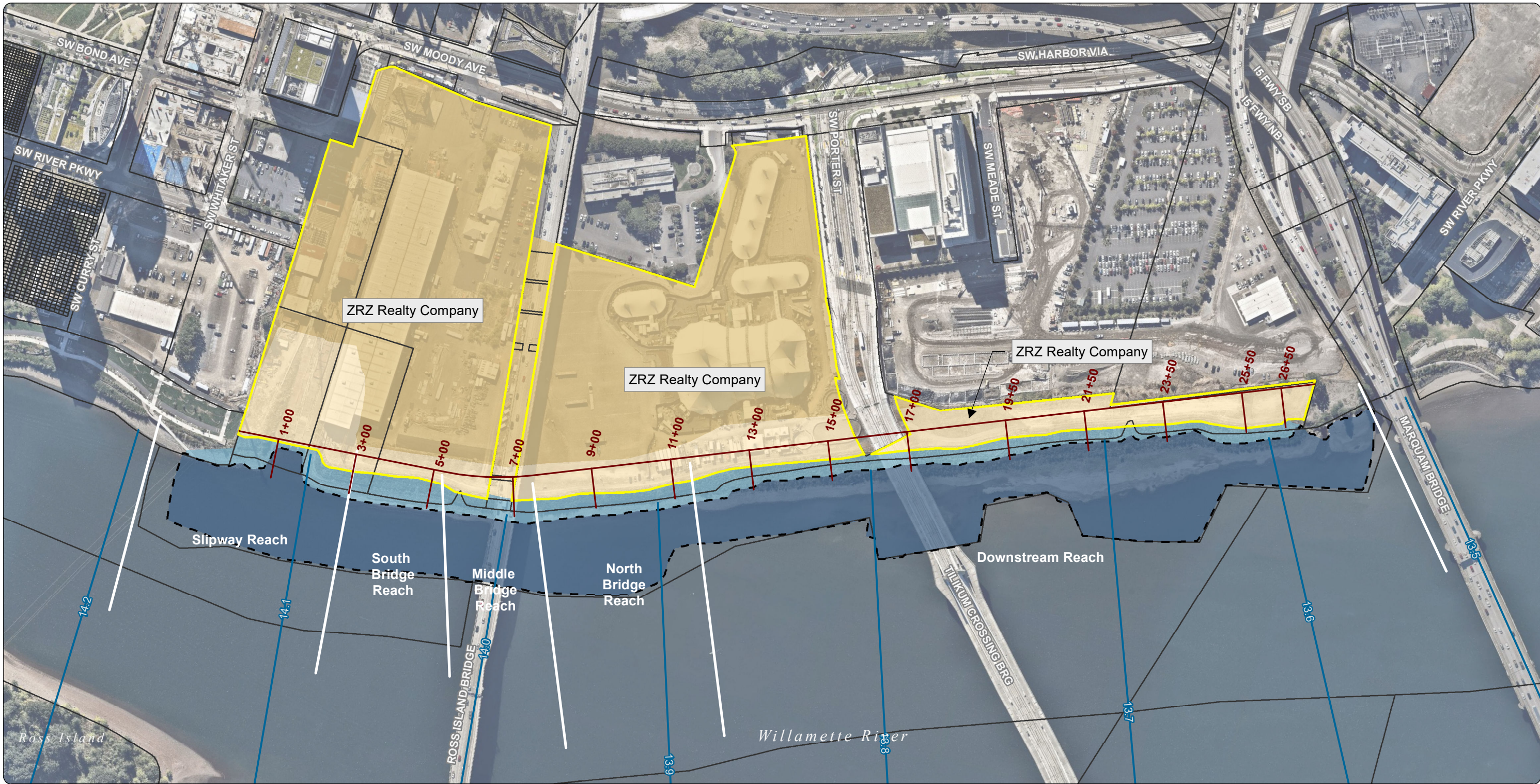
LIMITATIONS

The services undertaken in completing this report were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This report is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this report.

FIGURE





Source: Aerial photograph obtained from Mapbox;
property boundary obtained from
survey (2011) conducted by Olson Engineering;
river miles are based on the FEMA Current
Effective Model.



This product is for informational purposes and may not have been prepared for, or be suitable
for legal, engineering, or surveying purposes. Users of this information should review or
consult the primary data and information sources to ascertain the usability of the information.

Legend

- Sediment Cap Area
- Greenway Bank Area
- Greenway Upland Area
- Non-Greenway Upland Area
- Cap Boundary
- Monitoring Station
- River Mile
- Tax Lot Boundary
- ZRZ Realty Company Property Boundary

Figure
Site Features
ZRZ Realty Company
Portland, Oregon



PHOTOGRAPHIC LOG





STA: 0+00 - Top of bank looking east



STA: 0+00 - Top of bank looking west



STA: 0+00 - Top of bank looking upstream



STA: 0+00 - Top of bank looking downstream



STA: 0+00 - Top of rock armor looking east



STA: 0+00 - Top of rock armor looking west



STA: 0+00 - Top of rock armor looking upstream



STA: 0+00 Top of rock armor looking downstream



STA: 0+00 - Toe of slope looking east



STA: 0+00 - Toe of slope looking west



STA: 0+00 - Toe of slope looking upstream



STA: 0+00 - Toe of slope looking downstream



STA: 0+00 - Edge of water looking west



STA: 0+00 - Edge of water looking upstream



STA: 0+00 - Edge of water looking downstream



STA: 0+00 - Mounded rock armor over cap



STA 0+20 - Exposed TRM and visible soil, negligible change from 2019 inspection



STA: 0+20 - Toe of slope with exposed TRM



Slipway - Looking west



Slipway rails and sedimentation



Middle slipway, looking west



Minor area of exposed RCM adjacent to center rail, area is stable



Debris and gravel shoaling in slipway



Debris buildup and vegetation growth in the slipway



Vegetation growth on north slope of slipway



Vegetation growth on north bank of slipway, looking northeast.



Rock armor on northeast slope of slipway



Rock armor on north bank of slipway, looking northeast



STA: 2+50 - Northeast corner of slipway at top of rock armor, looking northeast



Stormwater outfall pipe segment separated, no change since previous inspections



STA: 3+00 - Top of bank looking east



STA: 3+00 - Top of bank looking west



STA: 3+00 - Top of bank looking upstream



STA: 3+00 - Top of bank looking downstream



STA: 5+00 - Top of bank looking east



STA: 5+00 - Top of bank looking west



STA: 5+00 - Top of bank looking upstream



STA: 5+00 - Top of bank looking downstream



STA: 7+00 - Top of bank looking east



STA: 7+00 - Top of bank looking west



STA: 7+00 - Top of bank looking upstream



STA: 7+00 - Top of bank looking downstream



STA: 9+00 - Top of bank looking east



STA: 9+00 - Top of bank looking west



STA: 9+00 - Top of bank looking upstream



STA: 9+00 - Top of bank looking downstream



STA: 11+00 - Top of bank looking east



STA: 11+00 - Top of bank looking west



STA: 11+00 - Top of bank looking upstream



STA: 11+00 - Top of bank looking downstream



STA: 13+00 - Top of bank looking east



STA: 13+00 - Top of bank looking west



STA: 13+00 - Top of bank looking upstream



STA: 13+00 - Top of bank looking downstream



STA: 15+00 - Top of bank looking east



STA: 15+00 - Top of bank looking west



STA: 15+00 - Top of bank looking upstream



STA: 15+00 - Top of bank looking downstream



STA: 17+00 - Top of bank looking east



STA: 17+00 - Top of bank looking west



STA: 17+00 - Top of bank looking upstream



STA: 17+00 - Top of bank looking downstream



STA: 19+50 - Top of bank looking east



STA: 19+50 - Top of bank looking west



STA: 19+50 - Top of bank looking upstream



STA: 19+50 - Top of bank looking downstream



STA: 21+50 - Top of bank looking east



STA: 21+50 - Top of bank looking west



STA: 21+50 - Top of bank looking upstream



STA: 23+50 - Top of bank looking east



STA: 23+50 - Top of bank looking west



STA: 23+50 - Top of bank looking upstream



STA: 23+50 - Top of bank looking downstream



STA: 25+50 - Top of bank looking east



STA: 25+50 - Top of bank looking west



STA: 25+50 - Top of bank looking upstream



STA: 25+50 - Top of bank looking downstream



STA: 3+00 - Top of rock armor looking east



STA: 3+00 - Top of rock armor looking west



STA: 3+00 - Top of rock armor looking upstream



STA: 3+00 - Top of rock armor looking downstream



STA: 3+00 - Toe of slope looking east



STA: 3+00 - Toe of slope looking west



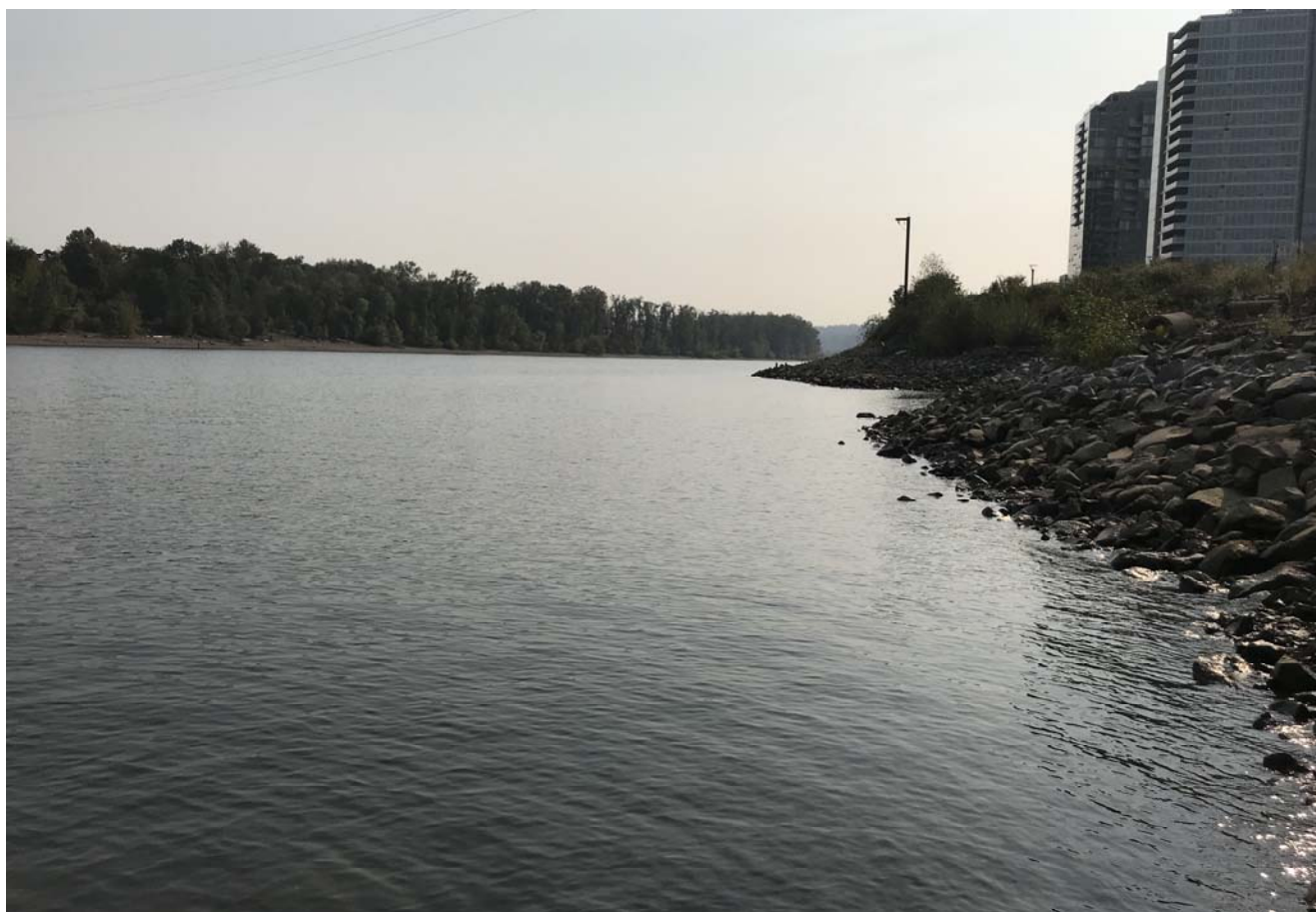
STA: 3+00 - Toe of slope looking upstream



STA: 3+00 - Toe of slope looking downstream



STA: 3+00 - Edge of water looking west



STA: 3+00 - Edge of water looking upstream



STA: 3+00 - Edge of water looking downstream



STA: 5+00 - Top of rock armor looking east



STA: 5+00 - Top of rock armor looking west



STA: 5+00 - Top of rock armor looking upstream



STA: 5+00 - Top of rock armor looking downstream



STA: 5+00 - Toe of slope looking east



STA: 5+00 - Toe of slope looking west



STA: 5+00 - Toe of slope looking upstream



STA: 5+00 - Toe of slope looking downstream



STA: 5+00 - Edge of water looking west



STA: 5+00 - Edge of water looking upstream



STA: 5+00 - Edge of water looking downstream



STA: 7+00 - Top of rock armor looking east



STA: 7+00 - Top of rock armor looking west



STA: 7+00 - Top of rock armor looking upstream



STA: 7+00 - Top of rock armor looking downstream



STA: 7+00 - Toe of slope looking east



STA: 7+00 - Toe of slope looking west



STA: 7+00 - Toe of slope looking upstream



STA: 7+00 - Toe of slope looking downstream



STA: 7+00 - Edge of water looking west



STA: 7+00 - Edge of water looking upstream



STA: 7+00 - Edge of water looking downstream



STA: 9+00 - Toe of slope looking east



STA: 9+00 - Toe of slope looking west



STA: 9+00 - Toe of slope looking upstream



STA: 9+00 - Toe of slope looking downstream



STA: 9+00 - Edge of water looking west



STA: 9+00 - Edge of water looking upstream



STA: 9+00 - Edge of water looking downstream



STA: 11+00 - Toe of slope looking east



STA: 11+00 - Toe of slope looking upstream



STA: 11+00 - Toe of slope looking downstream



STA: 11+00 - Toe of slope looking west



STA: 11+00 - Edge of water looking west



STA: 11+00 - Edge of water looking upstream



STA: 11+00 - Edge of water looking downstream



STA: 13+00 - Toe of slope looking east



STA: 13+00 - Toe of slope looking upstream



STA: 13+00 - Toe of slope looking downstream



STA: 13+00 - Edge of water looking west



STA: 13+00 - Edge of water looking upstream



STA: 13+50 - 2018 Bank repair area



STA: 13+75 - 2018 Bank repair area



STA: 14+00 - Live stake plantings from 2018 bank repair



STA: 15+00 - Toe of slope looking east



STA: 15+00 - Toe of slope looking upstream



STA: 15+00 - Toe of slope looking downstream



STA: 15+00 - Edge of water looking west



STA: 15+00 - Edge of water looking upstream



STA: 15+00 - Edge of water looking downstream



Bank area below Tilikum Crossing envelope, looking west



STA: 17+00 - Toe of slope looking east



STA: 17+00 - Toe of slope looking upstream



TA: 17+00 - Toe of slope looking downstream



STA: 17+00 - Edge of water looking east



STA: 17+00 - Edge of water looking west



STA: 17+00 - Edge of water looking upstream



STA: 17+00 - Edge of water looking downstream



STA: 19+50 - Toe of slope looking west



STA: 19+50 - Toe of slope looking east



STA: 19+50 - Toe of slope looking upstream



STA: 19+50 - Toe of slope looking downstream



STA: 19+50 - Edge of water looking west



STA: 19+50 - Edge of water looking upstream



STA: 19+50 - Edge of water looking downstream



STA: 21+50 - Toe of slope looking east



STA: 21+50 - Toe of slope looking west



STA: 21+50 - Toe of slope looking upstream



STA: 22+00 - Bank erosion elevations 11'-18' COP



STA: 21+50 - Edge of water looking west



STA: 21+50 - Edge of water looking upstream



STA: 21+50 - Edge of water looking downstream



STA: 23+50 - Toe of slope looking east



STA: 23+50 - Toe of slope looking west



STA: 23+50 - Toe of slope looking upstream



STA: 23+50 - Toe of slope looking downstream



STA: 24+00 - Lower bank erosion elevation 11'-18'



STA: 24+25 - Lower bank erosion elevation 11'-18'



STA: 25+50 - Toe of slope looking east



STA: 25+50 - Toe of slope looking upstream



STA: 25+50 - Toe of slope looking downstream



STA: 25+50 - Edge of water looking west



STA: 25+50 - Edge of water looking upstream



STA: 25+50 - Edge of water looking downstream



STA: 26+00 - Lower bank erosion below elevation 18'



STA: 25+75 - Lower bank erosion below elevation 16'



STA: 26+50 - Cap area looking west



City of Portland stormwater outfall 07b, looking northwest



City of Portland outfall 07b flow path, looking northeast



City of Portland outfall 07b flow path, looking southeast



City of Portland outfall 07b flow path, looking southeast



Upland cap - Northeast corner looking south



Upland cap - Northeast corner looking west



Upland cap - North edge looking east



Upland cap - North edge looking southeast



Upland cap - North edge looking southwest



Upland cap - North edge looking west



Gravel material stockpiles on upland cap



Upland cap - Northwest corner looking east



Upland cap - Northwest corner looking southeast



Upland cap - Northwest corner looking south



Upland cap - West edge looking north



Upland cap - North edge looking northeast



Upland cap - North edge looking east



Upland cap - Access road looking west



Upland cap - Access road looking north



Upland cap - Access road looking northeast



Upland cap - Access road looking east



Upland cap - Access road looking southeast



Upland cap - Southwest corner looking north



Upland cap - Southwest corner looking northeast



Upland cap - Southwest corner looking east



Upland cap beneath Ross Island Bridge in southeast corner



Operational area - East of stormwater pond looking east



Operational area - East of stormwater pond looking south



Operational area - Southeast of stormwater pond looking west



Operational area - Southeast of stormwater pond looking east



Operation area - Access road between office building and barge building



Operational area - Northeast of barge building looking southwest



Operational area - Main access gate looking northwest



Operational area - West of barge building looking west



Operational area - Upper fabrication area looking east



Upland cap - Southeast corner looking west



Upland cap - Southeast corner looking north



Upland cap - Southeast corner looking northeast