PROCESS SUMMARY—CITY OF ST. HELENS CENTRAL WATERFRONT REDEVELOPMENT

The outline below represents the major steps involved in filling the lagoon to create land surfaces that can be used in pursuit of the City of St. Helens' long-term goals for waterfront redevelopment. This opportunity is economically viable only if filling this large space is revenue-positive, which it can be if the lagoon is repurposed as a solid waste landfill. Initial projections suggest that revenue generation can be significant, which could support the City's redevelopment plans or other community improvement projects.

The feasibility analyses, design, and permitting are associated with the three primary system components:

- Conversion of the lagoon into a solid waste landfill under OAR 340-093 through -097.
- Retrofitting or moving the existing wastewater treatment plant.
- Renovation of existing dock and offloading infrastructure at the former Boise White Paper site, now owned by the City, to support bulk material offloading from barges. Alternatively, a separate facility could be constructed to accommodate sediment transfer.

At this stage, the facility is expected to be permitted and operated as a nonmunicipal-waste landfill exclusively for:

- Sediment not amenable to in-water open discharge
- Soil not amenable to uncontrolled placement as clean fill under the Oregon Department of Environmental Quality's (DEQ) Clean Fill policy (Internal Management Directive—Clean Fill Determinations, July 23, 2014)
- Wastewater treatment plant solids

The facility will not be permitted for and will not receive regulated hazardous waste of any kind, putrescible solid waste (municipal or highly organic waste), or construction debris. It will be constructed with:

- Bottom, sidewall, and top geomembrane liner
- Leachate collection
- Stormwater controls

In pursuing this opportunity, the City has established the following metrics:

- Create "landmass" for future use.
- Create jobs.
- Ensure public and environmental safety.
- Generate revenue for the city.
- Provide environmental enhancement.
- Meet regional needs for a disposal facility.

The interim step of soil and sediment receipt, placement, and compaction will begin with site characterization, conceptual design, and permitting. Separate but parallel efforts will be undertaken for development of a multimodal material transload facility (barge, rail, and truck) and mitigation of impacts to the existing wastewater treatment plant operations (system modifications and/or plant relocation).

The initial step for siting the facility is a Phase I site investigation, designed to ascertain existing site conditions, determine if the site is suitable, and obtain sufficient geologic and hydrogeologic information to develop a conceptual facility design and environmental monitoring program.

The second step uses the results of the Phase I site investigation to develop a conceptual design. A comprehensive Site Development Plan is prepared to describe conceptual design elements, environmental control systems, and documents analyses to select proposed technologies. The Site Development Plan will result in a design package that, ideally, will allow DEQ to issue a conditional solid waste facility permit.

A Phase II site investigation will be completed following DEQ review and initial design to address data gaps, facilitate a complete understanding of the site, and inform detailed engineering design.

Final design will incorporate results of the Phase II Site Investigation and all agency comments, and will provide a construction level facility design.

Permitting efforts primarily focus on negotiation with the DEQ solid waste department, although other local, regional, state, and federal permits may also be required. Other required permits processes will be initiated before receipt of a conditional and final approval from DEQ.

The process summaries listed below have been prepared to describe the steps required to gain conditional DEQ approval. Scoping for Phase II will occur following Phase I work.

- Wastewater Lagoon (Landfill), Phase I—Initial Site Characterization, Conceptual Design, Permitting,
- Off-Load Facility, Phase I—Initial Design and Permitting
- Risk Assessment and Preliminary Air Modeling,
- Wastewater Treatment Plant, Phase I—Impacts Analysis, and
- Continued Public Outreach and Communications.

Costs for the Phase I activities are provided on the following page.

SUMMARY BUDGET

PHASE I—WATERFRONT REDEVELOPMENT PROJECT, CITY OF ST. HELENS

Wastewater Lagoon (Landfill) Initial Site Characterization, Conceptual Design, Permitting

Location Restrictions		$27,800
Phase I Site Characterization/Investigation		$207,500
Upland Geotechnical Investigation		$105,500
Topographic and In-Water Survey		$80,500
Leachate Treatment and Disposal Feasibility Study		$11,400
Site Development Plan		$225,000
Phase I Landfill Permitting		$64,300
Phase II Work Plan Development		$26,400
	Subtotal:	$748,400

Offload Facility Initial Design and Permitting

Sediment Characterization		$53,600
Structural Evaluation For Existing Dock		$40,300
In-Water Geotechnical Investigation		$173,100
Offload Structure Engineering (30% Design)		$124,200
In-Water Work Permitting		$129,200
	Subtotal:	$520,400

Supporting Work Elements

Risk Assessment and Preliminary Air Modeling		$125,000
Wastewater Treatment Plant Impacts Analysis		$46,900
Continued Public Outreach and Communications		$103,800
	Subtotal:	$275,700

Total Phase 1 Cost: $1,544,500

WASTEWATER LAGOON (LANDFILL)

PHASE I—INITIAL SITE CHARACTERIZATION, CONCEPTUAL DESIGN, PERMITTING

The Phase I—Initial Site Characterization, Conceptual Design, and Permitting task covers efforts to acquire a conditional permit approval from DEQ under OAR 340-093-0090 for the conversion of the St. Helens wastewater treatment lagoon to a landfill disposal facility for sediment, soil, and wastewater treatment sludge. The siting and permitting processes are assumed to follow DEQ guidance for a non-municipal waste landfill facility.

Deliverables for this task include a Phase I Site Characterization Report and a Site Development Plan. The Site Development Plan consists of an engineering design; specific components of the site characterization and design are described below.

SCOPE OF WORK

Siting Analysis

Following DEQ guidance and regulations, siting analysis is the process of characterizing a site for the suitability of a landfill. Siting includes gathering of public information, Phase I physical site investigation and characterization, and conceptual facility design.

Location Restrictions

Location Restrictions analysis will involve gathering information to describe the characteristics of the physical location to determine if any characteristics of the site will preclude it from use as a landfill facility. Information obtained for this section is available from public sources such as the U.S. Geological Survey, State of Oregon, Federal Emergency Management Association, U.S. Soil Conservation Service, and other federal-, local-, and state-level agencies. The results of the location restrictions analysis will be completed as an initial task and summarized in the Site Development Plan described below. The following components will be analyzed to determine if site-specific restrictions exist that preclude the site from being developed as a landfill.

1. Airport safety—Proximity to airports restricts landfill vertical elevation and surface water features (because of interference of waterfowl with aircraft at low elevations). This step will document that there are no local and regional airports within a five-mile radius of the site (10,000 feet for turbojet aircraft, 5,000 feet for piston / prop style aircraft) that would trigger the need for a hazard mitigation approach to ensure safety of the site in relation to aircraft.
2. Floodplains—Landfills in floodplains can present hazards to the environment through potential release of waste during major flood events (e.g., 100-year flood events). Initial analysis shows that the lagoon site is entirely out of the floodplain; it is above the 100-year and 500-year flood elevations. However, ancillary facilities (i.e., off-load facility) would be inside of the 100-year floodplain boundary. The 100-year floodplain boundary will be compared to the site to document encroachment is not an issue for the lagoon area, and for use in assessing implications to ancillary facility design.
3. Wetlands—Mapped wetland areas (from publicly available sources) will be compared to the site limits, and a visual site inspection will be completed. No wetlands are present inside the existing lagoon footprint. If areas of concern for the primary site area or ancillary facilities are identified, a wetland delineation may be required (field investigation and delineation would be completed in Phase II).

Wetland mitigation, if necessary, may require coordination or permitting efforts through the U.S. Army Corps of Engineers, Oregon Department of State Lands (DSL), and U.S. Fish and Wildlife Service, among others.

4. Fault areas—Known and mapped faults will be identified and their proximity to the site will be mapped. If a fault is located within 200 feet of the site, structural analysis will be performed to ensure integrity of the site during a seismic event.
5. Seismic Impact Zones—The site will be analyzed to determine if it is located within a seismic impact zone. If it is determined to be within such a zone, it will be demonstrated that all containment structures will resist maximum ground acceleration and peak settlement. This item will also be analyzed in the Geotechnical Investigation report described below.
6. Unstable Areas—The site will be analyzed to determine if it is located in an unstable area that could be affected by differential settlement (expansive or compressible soils), landslides, man-made features that could be detrimental to structural stability, or other potential features that could physically affect the integrity of the site. If areas are identified, mitigation measures will be described to address unstable areas to ensure safety of the site.
7. Critical Habitat—Analysis will be completed to determine if the landfill facility could potentially impact threatened or endangered species. A biological opinion will be prepared to list any potential species of concern, and determine if the landfill facility is likely to impact those species. If species are identified for potential impact, additional permitting will be required from the federal Department of the Interior.
8. Sensitive Hydrogeologic Environments—Analysis will be performed to identify any sensitive hydrogeologic environments such as sole source aquifers, wellhead protection areas, water extraction areas, or other areas with potential to impact groundwater. Standard groundwater protection measures will be addressed in the design report.

Landfill Site Characterization

The Phase I Landfill Site Characterization task includes data collection to create an initial understanding of the location characteristics, soils, geology, and hydrogeology of the site. Data will be collected through a combination of publicly available sources and field investigation and summarized in the Phase I Site Characterization Report, to be signed by an Oregon Registered Geologist. The following components will be evaluated and investigated to characterize the site:

a. Existing conditions—The physical location of the site will be described including property boundaries, adjacent landowners, legal descriptions and physical topography. This task will include a topographic and boundary survey of the site.
b. Climate/meteorology—Historical climate information will be collected and summarized including high, low, and average ranges for temperature, precipitation, wind conditions, and other meteorological information.
c. Hydrology—Surface water drainage characteristics within one mile of the site will be mapped and described in relation to the site. Maps showing all streams, tributaries, and other drainage structures will be included.
d. Water Balance—The average annual water budget for the site will be analyzed. Analysis will include precipitation, runoff, run-on, infiltration, and evapotranspiration.
e. Water Use Inventory—All water supply wells within one mile of the site will be identified (from public records) and field verified. Public outreach within the study area will be performed to inventory possible wells not in the public inventory.

f. Geology and Hydrogeology Investigation (see Attachment A)—A public records search and field investigation will be performed to evaluate the regional geology and hydrogeology.

g. Phase II Work Plan—A plan will be prepared to outline Phase 2 site characterization in order to move forward with final design. Data gaps from the Phase 1 site characterizations will be identified, and input from preliminary agency review will be incorporated.

h. Geotechnical Investigation—see Attachment B.

Site Development Plan

The Site Development Plan will include preparation of an engineering design package for initial permit review by the Oregon DEQ. This work product will incorporate the results of the Phase 1 Site Characterization Report to determine necessary engineering, environmental controls, and operational components as follows:

1. Facility operations—Facility operation, waste stream characteristics (sources, disposal rates, capacity, etc.), access, and proposed facilities.
2. Conceptual Design—Drawings and technical specifications for all major components of the facility.
3. Landfill Phasing—Conceptual fill phasing for the anticipated life of the facility. The landfill is anticipated to be constructed in multiple phases to stage construction efforts and costs over time.
4. Leachate Management—Leachate management for the operational and post-closure stages, including leachate characterization and analysis of options for collection, removal, treatment, and disposal will be included.
5. Surface Water Management—Methods and facilities for management of stormwater runoff and run-on.
6. Landfill gas management—Landfill gas generation for the proposed facility is not anticipated. Analysis will be performed to verify assumptions and what measures, if any, will be incorporated.
7. Environmental monitoring—Environmental monitoring strategies. Final environmental monitoring plans will be prepared after final design is complete.
8. Closure and End Use—Final closure plans and anticipated end use. This is anticipated to be conceptual in nature and may present multiple options for the site after closure.
9. Leachate Treatment and Disposal Feasibility Study—Methods for treatment and disposal of leachate. This task may be completed as part of the Phase II assessment and final design pending approval by DEQ.

A topographic and bathymetric survey of the lagoon and surrounding areas will be performed as part of the design effort. Additional investigation to determine the lagoon floor (beneath sedimentation and sludges) may be performed as part of the Phase II work.

Permitting

The City will work with the DEQ and other stakeholders throughout the investigation and design to ensure fluidity with the facility development process. Regular communications and meetings are anticipated. The final permit application will include a compilation of the following information:

1. Signed Land Use Compatibility Statement.
2. Recommendation from the local solid waste planning authority.

3. Demonstration of need (market analysis).
4. List of other needed permits.
5. Certificate of Business Registry.
6. Fees.
7. Other information requested by DEQ.

Phase II Work Plan Development

Phase II will include efforts to continue the design and permitting efforts through a finished project design, final solid waste facility permit, and ancillary facilities design and permitting (off-load facility). As part of the Phase I effort, a work plan will be prepared to identify and address data gaps, agency responses to the initial design submittal, and prepare a schedule and task list for completion of the project; the Phase II task (not currently scoped) will implement that work plan.

The Phase II Work Plan will identify tasks to prepare the following items:

1. Final Design Report, 100% Design Plans and Specifications.
2. Construction Work Plan addressing project team and organization, preparation of Quality Assurance/Quality Control Plans, and reporting requirements.
3. Operations Plan addressing long term operation of the landfill facility.
4. Environmental Monitoring Plan.
5. Closure and Port Closure Plan.
6. Financial Assurance documentation.

ATTACHMENT A:

GEOLOGY AND HYDROGEOLOGY INVESTIGATION SCOPE

Consistent with the requirements of the Solid Waste Landfill Guidance, the investigation of the local geology and hydrogeology will include completion of exploratory borings, aquifer tests, groundwater sampling, and installation of monitoring wells adjacent to the lagoon. Based on site reconnaissance and available boring logs, the following will be performed:

1. Two deep borings on the bluff located west of the lagoon (presumably upgradient).

2. Three borings along the dike (presumably downgradient) separating the lagoon from the Multnomah Channel.

Adjacent to the lagoon on the west side is a basalt bluff that is higher in elevation relative to the lagoon. The basalt has been identified as the Sentinel Bluffs (SB) member of the Columbia River Basalt Group (CRBG). Initial field reconnaissance identified significant fracturing and jointing of the rock and a potential interflow zone. These characteristics suggest that the SB is locally recharged by precipitation/infiltration, and may represent a water bearing zone or aquifer, requiring evaluation per the Solid Waste Landfill Guidance. Downgradient of the lagoon, the SB is overlain by fill along the dike alignment, and/or alluvial sediments deposited during recent (quaternary) flood events.

Borings along the bluff will be advanced to depths that correspond to the bottom of the lagoon to characterize the fractured basalt aquifer and its connection with the lagoon and the Multnomah Channel. It is estimated that borings will be advanced using a Sonic drill rig, to depths of approximately 100 feet below ground surface (bgs). Ten-foot-long continuous cores will be collected using a 4-inch-inside-diameter stainless steel sampler and placed in plastic bags for lithologic description.

As mentioned above, geology upgradient of the lagoon is expected to consist primarily of fractured basalt. It is anticipated that down to 100 feet bgs, up to two interflow zones[1] may be encountered. When a groundwater interflow zone is encountered, groundwater samples will be collected and analyzed for general water chemistry parameters (described below). In addition, a constant-rate pumping test will be conducted to provide information on aquifer properties including transmissivity and hydraulic conductivity. The borings will be completed as monitoring wells once the desired depth is reached.

Borings will also be advanced downgradient of the lagoon, along the dike between the lagoon and the river. Groundwater elevation and chemistry data from these borings are required to characterize the fractured basalt aquifer and the overlying fill/alluvial water bearing zones, and the hydraulic connection with the Multnomah Channel. For the purposes of this evaluation, it is assumed that three borings will be advanced along the dike, two to depths of approximately 40 feet bgs and two to 80 feet bgs. Borings will be advanced using a Mud-rotary drill rig. Two of the four locations will also be evaluated for aquifer parameters using the same constant-rate pumping test. As with the upgradient locations, all borings will be completed as monitoring wells.

After completion, the monitoring wells will be surveyed using a licensed surveyor.

Groundwater samples will be analyzed for major ions (common cations and anions), as well as monitored for field parameters including temperature, pH, conductivity, dissolved oxygen, oxidation-reduction potential, and turbidity.

[1] Interflow zones consist of the top of one basalt flow, the bottom of the overlying flow, and any intervening sediment. These zones are generally permeable and important groundwater flow zones.

ATTACHMENT B:

UPLAND GEOTECHNICAL INVESTIGATION SCOPE

Consistent with the requirements of the Solid Waste Landfill Guidance, a geotechnical investigation will be performed that will consist of review of existing geotechnical information for the site, a site reconnaissance, subsurface explorations, laboratory testing, engineering analyses, and preparation of a report. The report will summarize findings and present preliminary recommendations for site improvements as part of the Phase I Site Characterization, along with recommendations for additional geotechnical explorations and analysis for Phase II Site Characterization.

The proposed preliminary geotechnical investigation will include the following items of work:

1. A total of four borings will be advanced for this phase of work. The borings will be advanced near the toe of the east dike near the existing railroad tracks. All borings will be advanced to hard rock, with one of the borings cored an additional 20 feet into rock. Hard rock is expected to be about 65 to 70 feet below the existing ground surface. The total estimated drilling footage is expected to be on the order of 280 feet. The borings will be made by a track-mounted drill rig, using open-hole, mud-rotary drilling and coring techniques. Disturbed split-spoon samples and/or undisturbed Shelby tube samples will be obtained from the borings at about 5-foot intervals of depth. The Standard Penetration Test will be conducted while the disturbed split-spoon samples are being taken.

2. Two electric cone penetration test (CPT) probes will be made to refusal, estimated at depths of about 30 and 65 feet. The total estimated probing depth will be on the order of 95 feet. The electric CPT is a static penetrometer used for soil explorations. Shear wave velocity testing will be performed at 1 meter intervals to refusal in the deeper CPT probe.

3. Laboratory tests will be conducted to provide data on the important physical characteristics of the subsoils, essential for engineering studies and analyses. These include standard classification tests such as natural water content and unit weight determinations, as well as strength and consolidation testing. The latter will provide the quantitative data necessary for the various design studies, such as settlement, and slope stability for the existing berms.

4. Engineering studies will be performed leading to the preparation of conclusions and recommendations concerning the following:

    a. Earthwork, including cut and fill slopes, wet-weather construction, and the suitability of on-site soils for use as structural fill.

    b. Stability of cut and fill slopes.

    c. Estimated settlements (total and differential).

    d. Allowable bearing pressures.

    e. Bearing strata.

    f. Seismic design criteria, including a Site Class in accordance with the current International Building Code (IBC) and Oregon Structural Specialty Code (OSSC).

    g. Evaluation of the potential for seismic-induced liquefaction and lateral spreading.

h. Conceptual ground improvement design for up to three representative cross sections.

i. Subdrainage requirements.

j. Design lateral earth pressures and coefficient of base friction.

k. Design criteria for temporary excavation shoring and dewatering systems. The scope assumes final ground improvement design would be completed as part of a subsequent design phase.

5. A site-specific seismic hazard study will be completed for the site to address the requirements of the current ASCE 7 Standards. This work will include a review of the potential seismicity of the site, development of the ground response for the site during the appropriate design earthquakes, and evaluation of potential geologic hazards. The seismic hazard study will include the following tasks:

    a. A detailed review of the literature, including published papers; maps; open-file reports; seismic histories and catalogs; works in progress; and other sources of information regarding the tectonic setting, regional and local geology, and historical seismic activity that might have a significant effect on the site.

    b. An in-depth examination and evaluation of the subsurface data for the site and vicinity, with particular emphasis on the potential for amplification or incoming seismic energy and liquefaction.

    c. Office studies and analyses that will lead to the preparation of conclusions and recommendations concerning: (1) seismic events that might have a significant effect on the site, including the proximity and potential seismicity of known faults; (2) the potential for site-specific seismic energy amplification at the site; (3) the ground response analysis for design earthquakes, which will include estimates of the peak horizontal ground acceleration; and (4) conclusions regarding seismic hazards, including liquefaction, lateral spreading, slope instability, ground rupture, and ground shaking.

6. A report will be generated discussing the work accomplished and presenting the results of the various tests and engineering analyses. The report will also provide recommendations for additional explorations and analyses for Phase II Site Characterization.

OFF-LOAD FACILITY

PHASE I—INITIAL DESIGN AND PERMITTING

The existing dock and infrastructure were used to bring fuel oil and raw products (wood chips) to the former mill and ship pulp products from the mill. Modifying these facilities to accommodate future use, i.e., barge offloading, will be administered through negotiations and permitting with the U.S. Army Corps of Engineers (COE) and the Oregon Department of State Lands (DSL). The off-loading infrastructure needs have not been entirely established; however, it is assumed that the following types of in-water work will be conducted:

1. Removal of dilapidated and/or obstructive pile.
2. Dredging to ensure adequate water depth for loaded barges.
3. Pile installation to support the off-loading structure.
4. Construction of an over-water off-loading structure and material handling systems.
5. Bank stabilization.

SCOPE OF WORK

The permitting process for the above in-water work will require submittal of a Joint Permit Application to DSL and the COE. The COE will engage with multiple other federal and state agencies throughout the process to ultimately obtain permit approval. The process typically spans one to two years from application submittal to permit receipt, involving meetings, multiple supporting documents, and sometimes extensive negotiations. The scope items listed below are anticipated elements for permit submittal.

Sediment Sampling

Sediment sampling for the dredge prism and new-surface material characterization will be conducted. This will include:

1. Evaluation of existing data.
2. Initial communications with the COE.
3. Development of a sampling and analysis work plan.
4. Sampling using a vessel-deployed vibracore.
5. Analysis of the standard list of sediment evaluation framework chemicals in addition to grain size, total organic carbon, and dioxins.
6. Data evaluation and reporting.
7. Pre-application meeting with the COE, DSL, and multiple other agencies and possibly tribal representatives to explain the need for and scope of the project.

Structural Evaluation of Existing Dock

A structural evaluation will be performed on the existing over-water dock structure to determine its feasibility for use in the project. This evaluation will inform the decision to modify the existing structure to fit the needs of the project, or determine if a separate new loading structure is a more cost-effective approach. The condition and load carrying capacity of the existing timber dock will be evaluated while considering the functional requirements for handling the dredge materials and delivery equipment across the dock. This will include:

1. Determining a range of probable loading requirements for the dock. These may include vertical loads on the deck of the dock and lateral barge mooring loads. Determine operational requirements such as deck areas, vessel mooring, driving lanes, staging / storage, and large equipment locations.
2. Reviewing as-built documentation, performing an on-site inspection, and condition assessment of the existing dock and nearby dolphins and analyze the load carrying capacity of the dock.
3. Evaluating pile capacities and other soil-related design criteria and recommendations.
4. Developing a draft technical report including:
    a. Design narrative.
    b. Summary of results from structural inspection and condition assessment.
    c. Available load carrying capacity of the dock.
    d. Summary of recommended modifications or repairs that would increase the load carrying capacity of the dock.
    e. Construction cost estimates for recommended repairs/strengthening.
    f. Conceptual drawings (plan, elevation, basic section) of dock improvements.

Geotechnical Investigation

A geotechnical investigation will also be performed to inform design needs in coordination with the structural analysis. Subsurface investigation will be performed and summarized in a report. The investigation will include:

1. Reviewing available geotechnical data and as-built drawings for the existing dock structure.
2. Two overwater borings will be completed along the proposed dock alignment and one overwater boring will be completed along the proposed trestle alignment between the dock and the riverbank. The borings will be advanced to hard rock, anticipated at depths of about 100 to 150 feet. The borings will be completed with a truck-mounted drill rig operating from a floating barge. In addition, one upland boring will be advanced to hard rock and cored an additional 10 feet into rock. Rock is understood to be present at depths of about 60 to 100 feet below the existing ground surface in the upland portion of the site.
3. Two electric cone penetration test (CPT) probes will be completed in the upland portion of the site, and will be advanced to refusal at estimated depths of about 60 to 100 feet. Shear wave velocity testing will be performed at about 1 meter intervals of depth to refusal in one of the CPT probes. A geotechnical engineer will select the areas for probing and observe portions of the testing as it is conducted by an experienced subcontractor.
4. Laboratory tests will be conducted to provide data on the important physical characteristics of the subsoils, essential for geotechnical engineering analyses. The laboratory tests will include standard classification tests, such as natural water content, Atterberg limits determinations, and unit weight determinations, as well as strength and consolidation testing. The latter will provide the quantitative data necessary for the various engineering analyses, such as evaluating settlement and slope stability for the existing riverbank slope.
5. Engineering analyses will be conducted, leading to recommendations and conclusions concerning (1) pile types, lengths, and axial compression and uplift capacities during both static and seismic condition for up to two pile alternatives; (2) lateral pile design parameters during static and seismic conditions; (3) slope stability; (4) slope protection; (5) seismic design criteria, including a Site Class in accordance with the current International Building Code (IBC) and Oregon Structural Specialty Code (OSSC); (6) evaluation of the potential for seismic-induced liquefaction and lateral spreading; (7) lateral earth pressure criteria for trestle abutment design, and (8) preliminary ground improvement designs. These

analyses will be completed at a single seismic hazard level in accordance with the IBC. Additional engineering analyses will be required if the design is advanced in accordance with a multiple hazard level design basis such as ASCE 61-14.

6. A site-specific seismic hazard evaluation will be completed for the upland portion of the site. Additional site response modeling will need to be updated for the geotechnical conditions at the dock.
7. A report will be prepared that discusses the work accomplished and presents the results of the various tests and engineering analyses. The report will also provide recommendations for additional explorations and analyses for final design, if appropriate.

Dock Structure Design

If it is determined that a new dock structure will be required, a 30% engineering design of the off-load facility will be prepared for permitting submittals based on the structural and geotechnical investigations. This will include:

1. Determining whether the existing dock is usable with appropriate modifications, or whether a new dock structure is preferred. Refine concepts for subsequent design and analyses.
2. Determining a range of probable loading requirements for the dock. These may include vertical loads on the deck of the dock and lateral barge mooring loads. Determine operational requirements such as deck areas, vessel mooring, driving lanes, staging / storage, and large equipment locations.
3. Identifying pile capacities, scour and other soil-related design criteria and recommendations.
4. Analyzing and designing conceptual dock, associated waterfront structures, and material handling systems.
5. Preparing conceptual construction cost estimates and drawings for waterfront structures and material handling systems.
6. Developing conceptual drawings and cost estimates.
7. Advancing the waterfront structure and material handling systems analysis and design from conceptual to 30% level of completion.
8. Preparing 30% drawings.
9. Preparing 30% construction cost estimate.
10. Summarizing design in 30% design report with drawings, costs, calculations, assumptions, and other applicable information.

Joint Permit Application

A Joint Permit Application submittal will be prepared, including:

1. Project characterization and alternatives analysis.
2. Biological evaluation for Endangered Species Act consultation with the National Marine Fisheries Service.
3. Water quality impacts assessment to the Oregon Department of Environmental Quality Water Quality Division for Clean Water Act compliance.
4. Cultural resources evaluation for adherence to the Historic Preservation Act.
5. Wetland evaluation for compliance with Section 404 of the Clean Water Act.

6. Project mitigation status documentation.

7. Compiled design drawings and supporting information.

8. Federal, state, and local agency coordination.

Note that as the structure design is refined, it may be that additional permitting elements are identified.

RISK ASSESSMENT AND PRELIMINARY AIR MODELING

A risk assessment will be prepared evaluating the potential risks to human health from exposure to sediment chemicals of concern (COCs) that may be handled at the proposed St Helens facility. The risk assessment will address the potential for dust generation and volatilization of COCs such as polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs) to air during handling of sediment and soil (transportation, offloading, placement), as well as air transport pathways and the potential for unacceptable inhalation risks near the facility.

SCOPE OF WORK

Initial Data Review

Data from published sources, databases, and regulatory guidance will be evaluated with relation to anticipated COCs that could be received at the site. The following components will be part of the initial data review:

1. Assess and identify chemical specific information such as volatilization and toxicity factors for sediment COCs, including but not limited to PCBs, SVOCs, and VOCs.

2. Review recent literature evaluating volatilization of COCs during sediment transportation, offloading, and placement activities.

3. Review chemical properties and toxicity databases such as the EPA integrated risk information system (IRIS).

4. Review peer-reviewed scientific literature for toxicity factors if unavailable from state or federal databases.

Data Evaluation and Risk Assessment

Collected data will be evaluated, compiled and utilized to complete a risk assessment for the site. The following components will be part of the data evaluation and risk assessment:

1. Determine potential dust and volatile loss to air of COCs during soil and sediment offload, handling, and placement based on Portland Harbor Superfund Site sediment COC concentrations, expected soil contaminant concentrations, and chemical specific properties. The evaluation will include estimating sediment concentrations for modeling based on available data that are representative of sites within the service area to be dredged.
2. Evaluate air transport pathways and potential receptors using air dispersion predictive modeling.
3. Using Oregon DEQ risk assessment models and federal air permissible exposure limits, evaluate potential risks to human health from the inhalation of the estimated COC air concentrations. The risk assessment will include a site conceptual model, identification of potential receptors, and assessment of potential exposure.

4. A technical report will be prepared to summarize findings. The report will be appended to the Site Development Plan as supporting information for the conditional permit approval.

WASTEWATER TREATMENT PLANT PHASE I—IMPACTS ANALYSIS

The City operates its wastewater treatment plant under a National Pollutant Discharge Elimination System (NPDES) permit administered by the DEQ. Understanding potential impacts to the wastewater treatment systems are integral to facility analyses; establishing a plan for the plant is an early planning need. City personnel most familiar with the wastewater treatment systems will direct and guide this analysis. The Phase I objectives and scope below build on work completed to date. Objectives include:

1. Assessing impacts to and options for wastewater treatment plant alterations and relocation.
2. Assessing permit ramifications, identify processes with DEQ.
3. Identifying options for interim operation of the plant and lagoon during fill operations.
4. Preparing feasibility study and predesign for new treatment plant and associated improvements to City infrastructure.

SCOPE OF WORK

Phase I Wastewater Treatment Plant Alterations/Relocation Options Evaluation

The following tasks will be completed to gather information to inform the City on the best course of action to address impacts to the wastewater treatment plant:

1. Identify impacts of the landfill development to system layout and operations.
2. Identify/assess reconfiguration options and costs.
3. Identify/assess relocation options and costs.
4. Prepare feasibility study outlining options.
5. Select option(s) for Phase II.

An initial analysis has been prepared generally addressing items 1–3 above. Continuation of these efforts and further examination of the costs, schedule, and additional treatment system options, as well as funding analysis, will be performed in this scope of work.

Phase II Wastewater Treatment Plant Alterations/Relocation Options Evaluation

Phase II will develop detailed options identified in Phase I, and work towards selection of a preferred alternative. The scope of this phase is contingent upon the selected options, and is expected to include the design of moderate to extensive system modifications and an NPDES permit amendment.

CONTINUED PUBLIC OUTREACH AND COMMUNICATIONS

The City of St. Helens is continuing a public outreach program, educating and engaging the community, providing accurate, timely information about the project, and seeking input on how the project proceeds. As the project moves into this next phase, broadening this outreach program is critical to maintaining transparency with affected communities, and ensuring community member and other stakeholders (locally, regionally, and across the state) have multiple opportunities to provide feedback on the project and how it might impact their lives.

SCOPE OF WORK

Public Involvement

Deliverables will include but are not limited to:

1. Public Involvement Plan
    a. Prepare a detailed Public Involvement Plan that establishes guiding principles for continued communications and engagement with the St. Helens community and broader regional and statewide stakeholders. Plan will develop specific stakeholder and community engagement, media relations, and communications strategies to guide proactive communication over the course of the next phase of the project.
2. Communications Management
    a. Prepare press releases, host media events and/or briefings and respond to media inquiries as appropriate.
    b. Maintain a project webpage which includes updated project materials, information on upcoming events and milestones, and clear instructions for how and when community feedback can be submitted.
    c. Attend regional meetings to represent the City and project, providing accurate information and updates as necessary.
3. Project Materials
    a. Prepare and update project materials to support communication strategies such as public events, web-based communication, and other direct engagement with the community and stakeholders.
4. Direct Engagement
    a. Respond to public inquiries throughout the project.
    b. Staff project booths at community events, centers, and fairs/festivals.
    c. Host project-specific public meetings or open houses to provide community members and stakeholders with the opportunity to learn about the project, ask questions of project team members, and provide comment or feedback.