City of West Linn

Memorandum

Date: October 25, 2012

To: West Linn Planning Commission

From: Zach Pelz, Associate Planner

Subject: New evidence received since noon on October 19, 2012, regarding Lake Oswego-Tigard Water Partnership pending land use proposals (CUP-12-02/CUP-12-04)

Attached is the public **testimony received since noon on October 19, 2012**, regarding the Lake Oswego-Tigard Water Partnership pending land use proposals.

LAKE OSWEGO - TIGARD WATER PROGRAM TEAM SUMMARY OF EXPERTISE

NAME	COMPANY	TITLE	YEARS OF EXPERIENCE
Jonathan R. Holland, P. E.	Brown and Caldwell	Vice President / Lake Oswego-Tigard Water Partnership Program Manager	27
D. Peter Oveson, P.E.	Brown and Caldwell	Pipelines Project Lead / Construction Manager	5
Brett D. Teel, P.E.	Brown and Caldwell	WTP Project Lead / Program Construction Lead	26
Thomas R. Lebo, B.S.	Brown and Caldwell	WTP Construction Manager	32
Robert G. Jossis, P.E.	Robert G. Jossis Consulting	Lake Oswego-Tigard Water Partnership Program Design Manager	38
Teresa Buchholz, P.E., C.W.R.E.	Integrated Water Solutions	Environmental Permitting Program Manager	29
Ethan J. Rosenthal, M.S.	David Evans and Associates	Program Regulatory Specialist / Ecologist	12
Phil Rickus, B.S.	David Evans and Associates	Program Regulatory Specialist / Ecologist	15+
Brett Shipton, P.E., G.E.	GeoDesign Inc.	Principal-in-Charge / Program Lead Geotechnical Engineer	15
Erica Hann, P.E.	GeoDesign Inc.	Project Manager / Program Geotechnical Engineer	8
Stephen Palmer, Ph.D., C.E.G.	GeoDesign Inc.	Sr. Engineering Geologist / Program Geotechnical Engineer	30
Charlie Clough, C.E.G.	GeoDesign Inc.	Project Manager / Program Engineering Geologist	15+
Elliott Mecham. P.E.	GeoDesign Inc.	Project Manager / Program Geotechnical Engineer	10+

LAKE OSWEGO - TIGARD WATER PROGRAM TEAM SUMMARY OF EXPERTISE

NAME	COMPANY	TITLE	YEARS OF EXPERIENCE
Brad Moore, P.E.	Kennedy/Jenks Consultants	Sr. Water Resources Engineer / Pipelines Design Project Manager	31
Fred Neal, P.E.	Kennedy/Jenks Consultants	Sr. Project Engineer / Finished Water Pipeline Design Team Lead	35+
Bill Yates, P.E.	Kennedy/Jenks Consultants	Sr. Project Engineer / Pipelines Technical Advisor	25
Bill Latone, M.S.	Kennedy/Jenks Consultants	Sr. Engineer / Pipelines Technical Advisor	35+
Tracie Mueller, M.S.	Kennedy/Jenks Consultants	Project Engineer / Pipelines Design Team	14
Aaron Eder, P.E.	Kennedy/Jenks Consultants	Sr. Project Engineer / Raw Water Pipeline Design Team Lead	17
Kim Staheli, P.E., Ph.D.	Staheli Trenchless Consultants	President and Principal / Trenchless Pipeline Design Team Lead	18
Laura Wetter, M.S.	Staheli Trenchless Consultants	Project Geologist / Trenchless Pipeline Design Specialist	6
Martin Cherrington	Cherrington	President Cherrington Corporation / Horizontal Directional Drilling Specialist	40+
Dale Doughty, P.E.	Norton Corrosion Limited	Project Manager / Pipelines Corrosion Protection	25+
Chad Lukkarila, M.S.	Kleinfelder	Project Manager / Pipelines Geotechnical Engineer	13
Mark Swank, M.S.	Kleinfelder	Project Manager / Pipelines Geotechnical Engineer	11
Brian Copeland, P.E., PTOE	DKS	Sr. Project Manager / Program Traffic Engineer	20

LAKE OSWEGO - TIGARD WATER PROGRAM TEAM SUMMARY OF EXPERTISE

NAME	COMPANY	TITLE	YEARS OF EXPERIENCE
Monica Leal, M.S.	DKS	Program Traffic Engineering Associate	13
Peter Kreft, P.E.	MWH	Project Manager / WTP Design Project Manager	33
Jude Grounds, P.E.	MWH	Project Manager / WTP Design Deputy Project Manager	12
Mike Faha, RLA, LEED AP	GreenWorks	Principal / WTP Landscaping Design Lead	26
Jerry Jacksha, P.E.	Shannon & Wilson, Inc.	Sr. Project Manager / WTP Geotechnical Design Lead	37
Yuxin (Wolfe) Lang, P.E., G.E.	Shannon & Wilson, Inc.	Associate / WTP Geotechnical Engineer	18
Jeffrey J. McGraw, A.I.A.	MWA Architects	Principal-in-Charge / WTP Architectural Lead	24
Kay Kinyon	Tree Care LLC	Program Arborist	39
Kristen L. Wallace, M.S.	Environ	Sr. Manager / Noise Study Lead	17
Donald B. Ballantyne, M.S.	Degenkolb	Principal / Pipelines Hazard Risk Management	38

Jonathan R. Holland, P.E.

Experience Summary

Jon Holland has 27 years of experience in facility planning, predesign, detailed design, and construction management for all sizes of capital improvements to municipal piping/pumping systems and treatment plants. He has successfully managed two multi-year, multi-project programs with budgets in excess of $100 million. Jon also has an extensive background in evaluating pipeline condition and in developing practical, effective programs and projects for rehabilitation and replacement. His work includes open-cut construction of large diameter pipelines as well as numerous "trenchless" projects using a variety of technologies. Jon has led several pump station projects, including development of design standards. From his public sector background, Jon brings a client perspective, an ability to develop consensus among varied interest groups, and experience securing public, political, and regulatory agency support and funding.

Assignment

Education

M.S., Environmental Engineering, Oregon State University, 1987

B. S., Civil Engineering, Oregon State University, 1984

Registration

Professional Engineer No. 25738, Washington, 1989

Professional Engineer No. 14742, Oregon, 1990

Experience

27 years

Joined Firm

1999

Relevant Expertise

- *Project and program management for municipal clients*
- *Sewer condition assessment and replacement/rehabilitation*
- *Inflow/infiltration evaluation and reduction program development, including flow monitoring and modeling*
- *Water, stormwater, and wastewater pipeline design from 8 to 80 inches in diameter*
- *Wastewater pumping stations*
- *Wastewater treatment planning and design*

Lake Oswego Interceptor Sewer, City of Lake Oswego, Oregon

Program Manager. Jon led predesign, final design and construction management efforts over 9 years to deliver this innovative, six-project, $90 million program. The end result is a new and upgraded interceptor and trunk sewer system in and around Oswego Lake. The program was completed in 2011 on schedule and 10 percent under budget despite a wide variety of daunting technical, permitting, and public relations challenges.

Alternatives for upgraded hydraulic capacity and seismic reliability were evaluated for 28,000 lineal feet of the existing interceptor system, ranging from 12 inches to 36 inches in diameter. Most of this length is submerged, either buried, resting on the lakebed, or pile-supported up to 30 feet above the bottom. The alternative selected for much of the system is a first-of-its-kind buoyant gravity sewer of HDPE, held down by ground anchors and tethers. A serpentine alignment provides expansion loops required to accommodate the 45 degree design temperature range while maintaining the nearly flat grade to close tolerances.

This approach avoids reliance on two less desirable alternatives: 1) an expensive pile-support system in the very soft, deep soils beneath the lakebed; and 2) an out-of-lake system of 6 pump stations and 35,000 feet of conveyance piping. Submerged access ports allowed routing flexibility to avoid greatest seismic hazards and to prevent navigational obstacles while providing access for inspection and cleaning. Extensive geotechnical and geophysical investigations were conducted using a variety of methods.

Tasks also included sewer cleaning and TV inspection, condition assessment, flow monitoring, hydrologic and hydraulic modeling, rehabilitation by cured-in-place pipe (CIPP) of adequately sized and supported segments, significant public and City Council involvement, environmental permitting, and easement and lake drawdown negotiation. A risk register was maintained throughout the design phase to help manage the comprehensive and continuous quality assurance process. Contractor and key specialty subcontractors were prequalified through a rigorous process. Key design team members were assigned significant roles in construction to ensure the tight tolerances were achieved.

Lake Oswego-Tigard Water Partnership, City of Lake Oswego and City of Tigard, Oregon

Program Manager. Jon is leading delivery of this 6-year, 6-project, $230 million program to replace and upsize the City of Lake Oswego's potable water supply system to meet the future needs of both Lake Oswego and the City of Tigard. Projects include:

- New 38 mgd intake structure and pump station on the Clackamas River in Gladstone
- 15,000 feet of new 42" pipeline from the intake to Lake Oswego's water treatment plant (WTP) in West Linn
- WTP expansion from 16 mgd to 38 mgd and addition of ozone treatment
- 35,000 feet of new 30" - 42" finished water pipeline
- New 3.5 million gallon reservoir in Lake Oswego
- New 20 mgd pumping station in Tigard

Responsibilities for the program team include:

- Program Management (schedule/cost/quality control, value engineering, public outreach, conceptual design, design firm procurement and oversight, field investigations, hydraulic evaluations, WTP process selection, specialty disciplines)
- Permitting (environmental and land use)
- Construction Management (constructability reviews, prequalification, CM and inspection for all projects)

Large Diameter Pipelines

South Tacoma Sanitary Trunk Replacement, City of Tacoma, Washington

Project Manager. Responsibilities included design and construction engineering support for replacement of 10,600 feet of 36- to 48-inch diameter sanitary trunk in major arterial streets and residential areas. Substantial traffic disruption potential was minimized at the Interstate 5 interchange with South 72nd Street and at a crossing beneath state Highway 99. Numerous utility conflicts were identified in advance and managed.

Outfall Pipeline, Onshore Portion, Central Wastewater Treatment Plant, City of Tacoma, Washington

Project Engineer and Project Manager. Jon was responsible for all aspects of the project from inception to audit, including planning, design, permits, easements, grants, specialty consultants, and construction management for 15,000 feet of 60-inch diameter pre-stressed concrete cylinder pipe. The project included a 400-foot pipeline bridge across the Puyallup River, an impressed current cathodic protection system, a contingency plan for handling contaminated soils and groundwater, a foundation support system in poor soils, numerous rail crossings by jacking and boring, high-strength pipe to withstand extremely heavy loading, and extensive coordination with the Port of Tacoma to maintain full operation despite the project alignment through the midst of its facility.

Leach Creek Force Main Extension, City of Tacoma, Washington

Project Manager. Options were evaluated for extension of this 48-inch diameter stormwater force main with capacity of 62 million gallons per day (mgd). Options included 4,600 linear feet of force main and 3,000 linear feet of gravity pipeline for Phase 1. Proposed modifications for later extension of the system in Phase 2 include an additional 3,000 feet of force main. A detailed predesign report was prepared to summarize the evaluation so that city staff could complete final design.

Pumping Stations and Force Mains

Wastewater Pumping Station Design Standards, City of Tacoma, Washington

Project Manager. Jon managed the program to develop comprehensive pump station design standards to address needs for both small and large stations. Objectives of greater standardization include reduced design and operation and maintenance (O&M) time and costs, and improved consistency and quality of design as the

City of Tacoma embarks on a multi-year program to replace many of its 50 stations. Extensive workshop sessions were conducted to provide information on various options for station configuration, for mechanical, electrical, and control systems, and to discuss city experience, feedback, and preferences. Work products include design guidelines for each of these subject areas as well as numerous standard specifications and details.

Martin Slough Pump Station and Force Main, City of Eureka, California
Project Manager. Jon managed the predesign phase for a 16-mgd pump station and 9,000 feet of dual 22- and 14-inch diameter force main and oversaw final design of the submersible station. Total estimated construction cost for the system is approximately $13 million. Force main alignment includes a 1,600-foot crossing of a slough and Highway 101 by horizontal directional drilling as well as three other highway, slough, and railroad crossings by bore and jack or pipe ramming methods. Alignment passes through numerous seasonal wetlands requiring extensive environmental permitting work and near businesses along Highway 101. Capital cost savings of single pipe were weighed against O&M cost savings of dual force main to accommodate a wide flow range. Odor control facilities are included for both the pump station and force main. The project included extensive hydrologic modeling efforts to develop flows from wet weather and future growth.

Hosmer Pump Station Replacement, City of Tacoma, Washington
Project Manager. Planning, design, and construction services phases were managed for a new 3-mgd, constant-speed, submersible station with difficult soils and high groundwater conditions. A standby generator and sophisticated SCADA system to meet city requirements were included.

Lincoln Avenue Pump Station Replacement, City of Tacoma, Washington
Project Manager. Jon directed planning and design phases completed by a consultant/client team for a 12 mgd pump station and 30-inch diameter force main on a 400-foot pipe bridge over the Puyallup River.

China Lake Pump Station, City of Tacoma, Washington
Project Manager. Jon oversaw the design of this 4 mgd pump station and 2,300 foot, 16-inch diameter force main.

Wingate Pump Station, City of Tacoma, Washington
Project Manager. Jon managed planning and design phases for this replacement 1-mgd, constant-speed, submersible pump station and 1,200-foot, 10-inch diameter force main in a residential neighborhood. A portion of the force main in an easement between houses was installed by horizontal directional drilling to minimized disruption and cost. Upsizing of the downstream gravity system was accomplished by both open cut and pipe bursting.

Sewer Rehabilitation

Sanitary Sewer Rehabilitation/Replacement Program, City of Tacoma, Washington
Project Manager. While managing the City of Tacoma's wastewater engineering section, Jon developed, implemented, and managed a $4 million per year program for 5 years, to begin the process of reconstructing an aging sewer system. He obtained support of senior city management, ratepayers, and city council by providing information on failure modes and life expectancy of sewers; unit prices of various reconstruction methods (e.g., emergency open-cut, competitive bid open-cut, and trenchless rehabilitation); current and future age distribution of sewer system at various reconstruction funding levels; annual investment required to minimize long-term cost; and importance of reliable sewer infrastructure and system capacity to support future growth and economic development. Basins and individual sewers were selected as candidates for television inspection using a variety of criteria and tools, such as maintenance history, pipe criticality, past TV inspection records, age and material of pipe, slope, infiltration/inflow (I/I), groundwater elevation, and soil type. TV inspection was used to finalize specific projects based on specific observed defects. Sewer rehabilitation/replacement was completed by methods such as cured-in-place pipe (CIPP), pipe bursting, fold-and-form lining, horizontal directional drilling, segmented sliplining, jacking and boring, and conventional open-cut. Manholes were either rehabilitated (with spray-on epoxies or cured-in-place liners) or replaced.

More than 120,000 feet of sewers were reconstructed under this program, ranging in size from 8 to 48 inches. Project costs ranged from $100,000 to $3 million. Public involvement was included on all projects to ensure citizen understanding of program needs and objectives. Projects in major arterials, state highways, and freeway interchanges required extensive traffic control measures to minimize disruption. Planning, design, and engineering services were provided during construction for all projects. Representative Tacoma projects are listed below:

- **North Monroe Street Sanitary Trunk, Unit A**

Rehabilitation/replacement of 2,700 feet of 24- to 30-inch diameter trunk sewer in residential neighborhood was completed using segmented sliplining and open cut.

- **North Monroe Street Sanitary Trunk, Unit B**

Rehabilitation of 7,300 feet of 18- to 42-inch diameter trunk sewer was completed in residential neighborhood, arterial streets, city park, and steep natural gulch using primarily CIPP with some open cut. Laterals were reinstated by external excavation.

- **Pacific Avenue, South 17th to South 28th, Sanitary and Storm**

6,000 feet of 10- to 21-inch diameter sanitary sewers and storm drains were reconstructed on a major downtown arterial using pipe bursting. The project site also included an interchange with Interstate 705 on and off ramps.

- **South 40th and Ainsworth, Sanitary and Storm**

7,500 feet of 8- to 24-inch diameter sanitary sewers and storm drains were reconstructed in a residential neighborhood and an arterial street using pipe bursting and open cut. Laterals were replaced by pipe bursting.

- **South 48th and Orchard Street, Sanitary Sewer**

2,000 feet of 10-inch diameter sanitary sewers were reconstructed in a residential neighborhood using pipe bursting and open cut.

- **Basin 5A2, Sanitary Sewer**

Rehabilitation/replacement of 39,000 feet of 8- to 15-inch diameter sewers in residential neighborhoods, a city park, and a sensitive natural gulch area, primarily using fold-and-form lining and pipe bursting with lesser amounts of open cut, CIPP, and boring and jacking. Laterals were reinstated internally.

- **Basin 3A1 and 4A2, Sanitary Sewer**

Rehabilitation of 20,000 feet of 8- to 15-inch diameter sewers in residential neighborhoods, primarily using fold-and-form lining with some open cut. Laterals were reinstated internally.

- **Basin 3B1, Sanitary Sewer**

Rehabilitation of 30,000 feet of 8- to 24-inch diameter sewers in residential neighborhoods and major arterial street, primarily using CIPP or pipe bursting with some open cut. Laterals were reinstated by external excavation.

- **Basin 4C1, Sanitary Sewer**

Rehabilitation of 10,000 feet of 8- to 15-inch diameter sewers in residential neighborhoods, primarily using CIPP or pipe bursting with some open cut. Laterals were reinstated by external excavation.

Sanitary Sewer Reconstruction, City of Corvallis, Oregon
Project Manager and Project Engineer. Jon evaluated 6,000 feet of 4- to 15-inch diameter sewer lines selected by the city as candidates for rehabilitation. He determined the relative priority of selected lines, appropriate technologies, and the most cost-effective packaging of projects for construction. Bid documents

were prepared for pipe bursting and open cut methods of construction for 2,300 feet of line in backyard easements and engineering support was provided during construction.

Unlined Concrete Sewer Rehabilitation, City of Phoenix, Arizona
Project Engineer. Preliminary design report was prepared for the rehabilitation of 7,800 feet of 27- to 48-inch diameter sanitary trunks selected through a previous condition assessment program. Predesign included update of pipeline condition grades and development and application of a screening process to select appropriate rehabilitation methods. CIPP and segmented sliplining were the recommended options, with CIPP being selected for final design.

Taylor Trunk Sanitary Sewer Structural Repair, City of Portland, Oregon
Project Manager and Project Engineer. Jon prepared the predesign report and construction plans and specifications for rehabilitation of 1,300 feet of deteriorated 36-inch diameter concrete sewer pipe. The pipe is 40 to 50 feet deep and lies beneath Interstate 5 and a busy on/off ramp. A prescriptive approach was used to ensure issues related to liner thickness and strength, hydraulic capacity, bypass pumping, and traffic control were not left to chance.

Memorial Union Sanitary Sewer Replacement, Oregon State University, Corvallis, Oregon
Project Manager. Construction plans and specifications were prepared on an accelerated schedule for relocation of 700 feet of 12-inch sanitary sewer. Extensive effort was required to identify and locate multiple service laterals to ensure uninterrupted service.

Maple Street Pump Station and Sewer Improvements, City of Albany, Oregon
Task Manager. Jon was responsible for predesign, design and engineering during construction for construction of 3,000 feet of 24- to 42-inch diameter sewer through downtown Albany by open cut. The project included open cut installation of 400 feet of 14-inch force main and rehabilitation of 200 feet of 15-inch diameter sewer by CIPP.

Sanitary Sewer Replacement, I/I Reduction Demonstration Project, Phase 1, City of Sweet Home, Oregon
Project Manager. After completing metering and modeling efforts in a prior project to identify priority basins for TV inspection, Jon evaluated inspection results and recommended replacement of 6,000 feet of 8- to 12-inch diameter sewer lines in two basins and replacement of 300 service laterals in three others. Pre- and post-construction flow monitoring and modeling were completed to evaluate the I/I reduction achieved. Bid documents were prepared and survey, inspection, and construction management services were provided.

Sanitary Sewer Replacement, I/I Reduction Demonstration Project, Phase 2, City of Sweet Home, Oregon
Project Manager. Jon led the effort to conduct metering and modeling to identify priority basins for TV inspection, evaluate inspection results, and recommend replacement by open cut of 6,700 feet of 8- to 12-inch diameter sewer lines and rehabilitation by CIPP of 6,800 feet of 8- to 10-inch diameter sewers. Pre- and post-construction flow monitoring and modeling were completed to evaluate I/I reduction achieved and determine whether overflow reduction goals can be met through sewer reconstruction alone or whether a plant capacity upgrade will also be needed. Work includes preparation of bid documents, and providing survey, inspection, and construction management services.

Sanitary Sewer Replacement, Phase 3, City of Sweet Home, Oregon
Principal-in-Charge. Jon oversaw design and construction of this project to reconstruct, rehabilitate, and replace, using a combination of pipe bursting, CIPP lining, and open cut methods, 18,000 feet of 8- to 10-inch diameter sanitary sewer and 350 private service laterals all the way to the house.

Sanitary Sewer Reconstruction, City of Riddle, Oregon
Project Manager. Brown and Caldwell assisted the City of Riddle in obtaining $3 million in grants and loans to fund a major sewer reconstruction project to address serious structural deficiencies as well as overflow problems. TV inspections were performed of the entire 27,000 feet of 4- to 15-inch diameter system, and 8,000 feet of sewer were reconstructed by pipe bursting. Service laterals were replaced from the main to the

property line. Bid documents were prepared and construction inspection and management services provided. Metering and modeling were conducted to further prioritize efforts and quantify the I/I reduction achieved.

Sanitary Sewer Rehabilitation, City of Lake Oswego, Oregon

Project Manager. Jon led this project to assess, determine appropriate rehabilitation methods, prepare bid documents, and manage construction of 18,000 feet of pipe bursting of 8- to 10-inch diameter sanitary sewer.

Modeling, I/I Reduction, Master Plans

I/I Reduction Program, City of Tacoma, Washington

Project Manager. Jon developed and managed ongoing program to remove sources of I/I for the City of Tacoma. The program was accepted by the Washington Department of Ecology as meeting NPDES permit requirements for an I/I reduction program with the goal of eliminating sanitary sewer overflows. Program elements included: flow monitoring; field investigation to identify defects using tools such as smoke testing, dye-testing, manhole inspection, and TV inspection; removal of direct inflow sources (including residential roof drains by city crews); sewer rehabilitation in selected high-priority basins; and follow-up flow monitoring to measure progress. As part of the effort to reduce overflows, a city-funded and installed backwater valve program was also developed and implemented to reduce residential basement backups and city liability.

Sanitary Sewer System Modeling, City of Tacoma, Washington

Project Manager. Jon managed a 3-year phased project to develop dynamic, calibrated system-wide hydrologic and hydraulic models and to use these models to identify current and future capacity restrictions, size new collection and treatment facilities, and measure I/I reduction achieved from several pilot projects. The project included purchase, installation, maintenance, and data downloading/analysis of 40 flow monitors and 7 rain gauges.

I/I Forecasting Model and Analysis, City of Salem, Oregon

Project Manager. Jon managed a project to accurately quantify I/I reduction achieved by sewer rehabilitation work in several basins through modeling. The project included development of protocol and tools to facilitate future I/I reduction analyses.

I/I Reduction Program, City of Sweet Home, Oregon

Project Manager. This project included preparation of a flow monitoring plan and an I/I reduction plan required by the Oregon Department of Environmental Quality (DEQ). Elements included hydrologic/hydraulic modeling, flow data interpretation, capital project identification, prioritization of field investigation work for city crews, and development of an ongoing sewer rehabilitation/replacement program.

I/I Reduction Program, City of St. Helens, Oregon

Project Manager. This project included metering and modeling to determine peak flows and existing system capacity deficiencies. Recommendations developed from this effort include extent of rehabilitation in priority basins to reduce I/I (and restore structural integrity) and upsizing where needed to quickly address capacity restrictions during the 5-year event. Striking a balance between these strategies required understanding of sewer rates, impacts at the wastewater plant, and NPDES permit conditions.

Collection System Evaluation and Planning, City of Crescent City, California

Task Manager. As part of an overall facility planning project, Jon conducted flow monitoring and performed hydrologic/hydraulic modeling to identify I/I response to rainfall. The project included estimation of I/I reduction from a pilot program of main line and lower lateral replacement. Basin and total plant flows were provided under a wide range of conditions, including peak wet weather flows of various recurrence intervals. Capacity deficiencies and required upgrades to sewers and pump stations were identified. A cost-effectiveness analysis was prepared to help the city strike a proper balance between capacity upgrades and I/I reduction through sewer system rehabilitation. A TV inspection defect entry software and condition assessment tool was provided to promote accurate ranking of line segments with respect to structural and operational defects and collection system management program were developed recommendations which form the foundation of the city's CMOM program.

Wastewater Treatment Plants

Treatment Plant Facilities Plan/Comprehensive Sewer Plan, Central Wastewater Treatment Plant, City of Tacoma, Washington

Project Manager. Jon managed this 3-year planning effort to identify future expansion potential for a 28-mgd regional treatment facility and its service area. Key issues included: re-rating existing secondary treatment capacity to accommodate growth in existing as well as future service areas; increasing peak hydraulic capacity by replacing screening and grit removal facilities as well as influent and effluent pump stations and constructing a new high-rate clarification process (ballasted sedimentation) for parallel, peak-flow treatment up to 150 mgd; coordinating with four surrounding sewerage agencies that were also preparing plans for future sewerage facilities; and integrating with the city's sewer utility business planning process to identify opportunities to market various commodities (e.g., transmission and treatment capacity) and services (e.g., laboratory, maintenance, operations, engineering, industrial pretreatment) to ensure upgrades occur with least impact to ratepayers.

Secondary Treatment Upgrade, Central Wastewater Treatment Plant, City of Tacoma, Washington

Project Engineer. Jon was responsible for construction grant administration, project closeout, preparation for audit, response to audit, and audit resolution, resulting in preservation of $1.8 million in grant funds originally questioned in the Environmental Protection Agency audit.

Digester Gas Utilization Facility, Facility Plan, Central Wastewater Treatment Plant, City of Tacoma, Washington

Project Manager. The project consisted of a planning effort to determine how best to modify an existing gas scrubbing/vehicle fueling facility to overcome lower than expected gas production and higher than expected consumption of digester gas for sludge heating. Options considered to allow more continuous running of the scrubbing facility included downsizing compressors and construction of high-pressure, clean and raw gas storage tanks.

Physical-Chemical Treatment Process, North End Wastewater Treatment Plant, City of Tacoma, Washington

Project Manager. Jon was responsible for all aspects of a 5-year process to secure regulatory agency approval, permitting, and grant funding of this unusual, and therefore, controversial process. He conducted pilot testing, researched and ensured compliance with applicable state and federal laws, prepared reports and analyses, wrote grant applications, directed engineering consultants, worked with outside legal counsel through various appeals and proceedings, and wrote letters and made presentations to regulatory agency staff at technical and senior managerial levels as well as to state and local elected officials.

At the end of the process, Jon negotiated consent decree and NPDES permit terms and conditions which allowed the city to use this highly efficient and cost-effective process. Compared to the alternative, capital costs were reduced from $40 million to $7 million and O&M costs were also lowered. Grant funding for the final plant upgrade project was secured, and Jon received an Exemplary State and Local Government Award from the National Center for Public Productivity at Rutgers University, the Local Government Information Network, and the American Society for Public Administration.

Plant Upgrades, North End Wastewater Treatment Plant, Tacoma, Washington

Project Manager. Jon was responsible for all planning, design, and construction management for a series of projects over a 10-year period to convert a formerly primary treatment plant to a permanent, 7-mgd, physical-chemical treatment plant with a biological filter for polishing effluent biochemical oxygen demand. Projects included: clarifier rehabilitation/upgrade; chemical feed and computer control building; chlorine contact basin expansion; outfall extension; and a major upgrade to construct the biological filter with influent and effluent pumping, construct a new headworks/screening building, and replace much of the original equipment, piping, and control systems. Extensive communication was coordinated among operations, maintenance, and engineering staff. Grant applications were written and the resulting grant agreements were administered.

Wet Weather Primary Clarifier Improvements, Columbia Boulevard Wastewater Treatment Plant, City of Portland, Oregon

Project Engineer. 95 percent plans and specifications were finalized for advertisement and construction of a project to convert existing, full-time primary clarifiers to intermittent, wet weather operation. Assistance was provided during bidding and engineering support was provided during construction.

Wastewater Facility Plan, City of Sweet Home, Oregon

Project Manager. Jon managed a planning effort to determine how best to reduce I/I and treat peak wet weather flows to bring the City of Sweet Home into compliance with NPDES permit conditions and a DEQ order. Recommendations led to design and construction of a series of sewer rehabilitation/replacement projects listed above.

Memberships

Pacific Northwest Clean Water Association (PNCWA)

Water Environment Federation (WEF)

American Water Works Association (AWWA)

Publications/Presentations

1. "Innovative Buoyant Interceptor Sewer." Presented at the China Plastic Piping Association Conference, Beijing, China, November 2011.
2. "Snake in a Lake – An Innovative Pipeline Design." *Journal AWWA*, July 2011.
3. "Lake Oswego's Buoyant Interceptor Sewer System Takes Shape." Presented at the ASCE Pipelines Conference, Seattle, WA, July 2011.
4. "Unique Challenges Drive Innovative Solution – Buoyant Interceptor Sewer in a Lake." Presented at the WEF Collection Systems Conference, Raleigh, NC, June 2011.
5. "Unique Challenges Drive Innovative Solutions - Lake Oswego's Buoyant Interceptor Sewer Takes Shape." Presented at the PNCWA Conference, Bend, OR, October, 2010.
6. "Lake Oswego Interceptor Takes Shape in Oregon." Presented at Plastic Pipes XV Conference, Vancouver, BC, September 2010.
7. "Underwater Sewer Replacement Options – No Easy Answers In, Under, or Around Lake Oswego, OR." Presented at WEF Collection Systems Conference, Portland, OR, May 2007.
8. "Selecting the Best Lake Interceptor Replacement Option – City of Lake Oswego Makes a Difficult Choice." Presented at PNCWA Conference, Vancouver, WA, September 2007.
9. "Ballasted Sedimentation for Tacoma's Wet Weather Flows," with Doug Berschauer. Presented at Pacific Northwest Pollution Control Association (PNPCA) Conference, Bellevue, WA, November 1999.
10. "City of Tacoma's Roof Drain Separation Program." Presented at PNPCA Conference, Eugene, OR, October 1995.
11. "Physical-Chemical Process Meets Secondary Treatment Levels at Tacoma's North End Plant." Presented at PNPCA Conference, Eugene, OR, October 1989.

D. Peter Oveson, P.E.

Experience Summary

Peter Oveson has over 5 years of experience in the fields of civil and environmental engineering and construction management. Peter performs design, coordination, task lead, and project management duties on a variety of projects relating to wastewater collection, potable water, and small hydroelectric power projects. Peter's experience includes project planning, alternative analysis and feasibility studies, final design, preparing plans and contract documents, cost estimation, project scheduling, construction management, and project management.

Assignment

Education

M.S. Civil and Environmental Engineering, Utah State University, 2008

B.S., Civil and Environmental Engineering, Magna cum Laude, Utah State University, 2008

Registration

Professional Engineer No. C77143, California, 2010

Experience

5 years

Joined Firm

2008

Relevant Expertise

- *Civil Engineering Infrastructure*
- *Hydraulics*
- *Hydroelectric Power Design and Permitting*
- *Construction Management*
- *Project Management*

Lake Oswego Tigard Water Partnership Program, Cities of Lake Oswego and Tigard, Oregon

Project Lead, Raw and Finished Water Pipelines. Brown and Caldwell is leading the $200 million Lake Oswego-Tigard Water Partnership for these two Oregon cities. The program involves management and oversight of six critical projects to be completed in an aggressive 5-year time frame. The improvements will allow Lake Oswego and Tigard, to address projected capacity, infrastructure, and water supply deficiencies, secure unused portions of existing Lake Oswego water rights on the Clackamas River, and enable Tigard to acquire an ownership stake in water supply facilities. Projects included in the program include an intake structure and pumping station, 15,000 feet of new raw water pipeline, 35,000 feet of new finished water pipeline, a water treatment plant expansion, a new 3.5 MG reservoir, and a new 14 mg pump station.

Peter manages the design team for the raw and finished water pipelines, which have an estimated construction value of $60 million. The pipelines will be broken up into 5 different construction contracts. The design of the raw and finished water pipelines includes open-cut and trenchless construction of large (up to 48-inch diameter) steel and ductile iron pipe. Trenchless pipeline design includes two horizontal directional drilling installations of 42-inch steel pipe, one under the Willamette River (3,800 feet long) and one under Oswego Lake (2,600 feet long) in addition to several shorter auger bore crossings (up to 500 feet long) Peter is also involved in the management of multiple land use applications, environmental permits, and easement acquisition processes that are required for the raw and finished water pipelines. The pipelines cross through many different jurisdictions including four cities, two counties, and the Oregon Department of State Lands (DSL).

Lake Oswego Interceptor Sewer (LOIS), City of Lake Oswego, Oregon

Task Lead/Project Engineer. The City of Lake Oswego replaced the main interceptor sewer that is located underwater in Oswego Lake. The original Concrete Cylinder Pipe sewer was supported on piles and anchor blocks on the bottom of Lake Oswego and was deemed seismically unstable. The replacement interceptor sewer was constructed of 42 inch diameter fused high-density polyethylene (HDPE) pipe and was supported using seismically designed ground anchors and piles. Ground anchors with associated tethers and buoyancy floats were used to support the pipe in the deep portions of the lake to avoid excessively long piles in soft lake sediment. In shallow portions

Brown AND Caldwell

of the lake, the pipe was supported on piles at or near the bottom of the lake. The program consisted of six separate projects, with the two largest consisting of underwater work completed with the lake full and pipe laying and earthwork completed with the lake drained. Each project was further divided into a design and construction phase. The overall program was valued at approximately $100M.

Peter was a key team member involved in the design phases of the Lake Full and Lake Down Projects. His responsibilities during the design phase of the program included task leadership for civil design of the pile supported and buoyant supported pipelines. Task leadership included but was not limited to the coordination of technical staff and subcontractors to conduct pipeline engineering design, hydraulic analysis, pile design, ground anchor design, wire rope and rigging design, manhole design, preparation of the contract documents, cost estimating, and constructability analysis.

Peter was the lead engineer during the construction phases of the Lake Full and Lake Down Projects. His responsibilities during the construction of these projects included design oversight for all civil work. Tasks included but were not limited to coordination of technical staff and subcontractors for design issue resolution, submittal review, RFI review, change order negotiation and execution, schedule review, contractor progress payment review, and preparation of project as-builts.

Renewable Energy Feasibility Study, Midway Sewer District, Kent, Washington

Task Lead, Micro-Hydro. Brown and Caldwell completed a feasibility study in 2010 for a renewable energy upgrades to the Midway Sewer District's wastewater treatment plant. One component of the feasibility study was exploring the possibility of installing a micro-hydro turbine on the plants outfall into the Puget Sound. Peter led a team in studying funding and partnership opportunities, permitting requirements, water rights development, power revenue forecasting, and financial planning for the micro-hydro portion of the project.

Gresham Wastewater Treatment Plant Outfall Micro-Hydropower Feasibility Study and Preliminary Design, City of Gresham, Oregon

Project Engineer. Brown and Caldwell conducted a feasibility study and preliminary design of a small-scale hydropower facility on the Columbia River outfall for the City of Gresham's wastewater treatment plant. The work was performed under an Energy Trust of Oregon renewable energy study grant. As a part of the study, Peter evaluated alternative locations and design options and assisted the City in selecting a preferred alternative for the detailed feasibility analysis and preliminary design. The evaluation of alternatives included developing head/flow curves for the system based on current and expected future operating conditions; determining the hydraulics of the pipelines, outfall, and diffuser for various flows and durations; developing power production data based on various sizes of turbines/generators; evaluating permitting requirements and operations and maintenance issues for alternative sites; and recommending the optimal hydropower unit and location for the hydropower facility.

The detailed feasibility analysis also included defining permitting requirements and a permitting schedule for the potential project, evaluating power generation options and associated technology, assessing power use and sale options, researching available tax incentives and other funding sources, and performing a life-cycle cost analysis. Peter developed a preliminary design for the selected alternative to support the life-cycle cost analysis and permitting analysis, and to assist the City in pursuing additional grant funding for project construction. The preliminary design includes developing a site plan; selecting equipment for the hydropower facility; laying out the power distribution plan; and developing a permitting, construction and capital funding schedule.

Distribution System Micro-Hydro Feasibility Study, Oregon City, Oregon

Project Engineer. Brown and Caldwell completed an initial feasibility evaluation in August 2008 for potential micro-hydro projects on the city of Oregon City's water distribution system. As a part of that evaluation, Peter assisted the City in developing an application for funding from the Oregon Economic and Community Development Department for a more in-depth feasibility study.

Santa Barbara Hydro Plant, Santa Barbara, California

Project Engineer. Peter assisted in developing a plan to re-license and place back in service an existing 0.75 MW hydropower plant for the City of Santa Barbara, CA. The project included inspecting existing equipment and evaluating operating conditions for the system. The project also included determining the feasibility of installing additional hydroelectric facilities at various locations in the transmission and distribution systems.

Albany Canal Improvements, City of Albany, Oregon

Project Engineer. Peter was a key team member in the design and project management of the rehabilitation of two hydraulic control structures on the Albany Canal. He assisted in hydraulic calculations, regulatory compliance, design drawings, and cost estimation for the project.

Fanno Basin Pump Station Surge Tank Design, Portland, Oregon

Project Engineer. Peter assisted in the preliminary design of a surge tank system required to protect the structural integrity of a force main. He assisted in design drawings and cost estimation for the project.

Sweet Home Flow Metering and Modeling, City of Sweet Home, Oregon

Project Engineer. Peter assisted in the creation of a hydraulic model to determine necessary wastewater collection upgrades. He helped create and updated a GIS based hydraulic model of the City's wastewater collection system.

Success Dam Physical Model Study, Porterville, California

Project Manager/Graduate Research Assistant. As an employee of the Utah Water Research Laboratory at Utah State University, Peter managed a low-level outlet works physical hydraulic model for an Army Corps of Engineers' dam in central California to determine the proper sizing of and capacity of the outlet works air vents. He oversaw all drafting, model construction, collection of data, hydraulic analysis, air-water hydraulic research, and completion of the final report.

Western Township Pump Intake Physical Model Study, Canton, Michigan

Graduate Research Assistant. Peter conducted a wet well physical hydraulic model for a wastewater pumping station at the Utah Water Research Laboratory at Utah State University. He assisted in project management, drafting, model construction, collection of data, hydraulic analysis, and the completion of the final report.

Memberships

American Waterworks Association Pacific Northwest Section

Brett D. Teel, P.E.

Experience Summary

Brett Teel has significant experience in the design and construction of wastewater projects. His background includes planning and design, as well as quality assurance for contract documents. He is a regionally-recognized expert in the design of wastewater treatment plants, pump stations and odor control facilities. With the knowledge he has acquired as a construction contractor and consulting engineer, combined with his design expertise, he can effectively prepare clear design and construction documents in addition to quality assurance reviews.

Mr. Teel is a senior project manager specializing in heavy civil projects for public sector clients. He manages multi-discipline engineering teams to guide complex projects through planning and the subsequent phases of regulatory permitting, technical design, bid document preparation, and construction implementation. His experience includes managing numerous projects including system planning, treatment plant improvements, water and sewer pipelines, pump stations, outfalls, earthwork management, erosion and sediment control, environmental permitting and compliance, and design team management. His specialty skills include devising and incorporating critical construction sequencing and constraints into bid documents necessary to maintain facility operations during construction and to minimize inconveniences to stakeholders.

Assignment

Education

B.S., Civil Engineering, California State, University of Chico, 1979

Registration

Civil Engineer, Oregon 1992

Civil Engineer, Washington 1994

Experience

26 years

Joined Firm

2007

Relevant Expertise

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Program Management, Permitting and Construction Management, Lake Oswego-Tigard Water Partnership Program, Cities of Lake Oswego and Tigard, Oregon

Program Management Core Team Member. Served to define the program and budget for this $230M upgrade to the existing City of Lake Oswego water system and its expansion and extension to the City of Tigard. The Program provides for expanding the system capacity from 16 to 38 mgd including a new raw water intake pump station on the Clackamas River in the City of Gladstone, three miles of raw water pipeline and Willamette River crossing extending to the water treatment plant in the City of West Linn, a water treatment plant facility expansion, seven miles of water transmission pipeline, a new terminal reservoir, and a new pump station conveying water to the Tigard distribution system.

Business Strategy Development and Solids Handling Planning and Design, Water Environment Services, Clackamas County, Oregon

Design Integration. Brown and Caldwell is working with WES to develop business strategies for its biosolids and energy programs and providing planning and design services for solids handling needs within the sanitary sewer districts managed by WES.

Digester Heating and Cogeneration System Evaluations and Recommendations, Systems Improvements, Kellogg Creek Water Pollution Control Plant, Water Environment Services, Clackamas County, Oregon

Project Manager. The project provided for analysis and design of improvements to address periodic hydraulic and process limitations at the plant, and to replace aged process support systems. The project includes an energy savings upgrade to the aeration system (high speed turbo blowers, dissolved oxygen control, a modernization of the plant's SCADA system and assistance to WES staff to analyze digester heating/mixing system concerns.

Digester Waste Gas Incineration and Site Utilities Improvements, Kellogg Creek Water Pollution Control Plant, Water Environment Services, Clackamas County, Oregon

Project Manager. The project provided for design of design of digester gas odor control improvements, replacement of plant wide SCADA system raceways, improvements to four plant water distribution systems, addition of a well water supply and pumping system and replacement of digester gas waste gas burner.

Disinfection Improvements, Hoodland Water Pollution Control Plant, Water Environment Services, Clackamas County, Oregon

Project Manager. The project provides new dechlorination facilities required to satisfy new NPDES permit requirements, a fast track project that will be implement by WES staff this year.

Systems Improvements – Kellogg Creek Water Pollution Control Plant, Water Environment Services, Clackamas County, Oregon

Project Manager. The project provided for analysis and design of improvements to address periodic hydraulic and process limitations at the plant, and to replace aged process support systems. Major elements are: Addition of Chemically Enhanced Primary Treatment (CEPT): New ferric chloride and anionic polymer storage and delivery systems are added to accommodate peak hour flows up to 28-mgd. Addition of Flow Management System: Provides for addition of spilt treatment at the plant to accommodate 18 mgd (peak hour) of secondary treatment with UV disinfection and 10 mgd (peak hour) of primary treatment with chlorine disinfection during severe wet weather events, working in conjunction with new CEPT facilities. Replace and add chemical disinfection storage and delivery systems to backup UV disinfection of secondary effluent and provide chlorine disinfection and de-chlorination system for primary effluent. Digester Heating System: Analyze system heating problems and recommend improvements. Activated Sludge Aeration System: Replace activated sludge aeration blowers with high speed turbo blowers, replace aeration header piping, and provide dissolved oxygen (DO) controls. Pursued/obtained funding grants from the Energy Trust of Oregon for the more efficient aeration system improvements. Modernize the plant-wide SCADA system to accommodate existing systems and new improvements. New PLCs, fiber optics network and programming are provided to accommodate the modernization.

Digester Gas Odor and Site Utilities Improvements, Kellogg Creek Water Pollution Control Plant, Clackamas County, Oregon

Project Manager. The project provided for design of design of digester gas odor control improvements, replacement of plant wide SCADA system raceways, improvements to four plant water distribution systems, addition of a well water supply and pumping system and replacement of digester gas waste gas burner.

East Bank Wastewater Treatment Plant, Jefferson Parish, Louisiana

Project Engineer. Brett was the project engineer for yard piping, utilities, site preparation and the headworks for a new 40 mgd wastewater treatment facility. The project decommissioned three smaller plants and consolidated treatment at the East Bank plant.

Eugene Water and Electric Board's Leaburg & Waterville, Oregon

Construction Manager. Brett served in a variety of roles assisting EWEB to implement the necessary improvements to satisfy the conditions of the license issued by the Federal Energy Regulatory Commission. His role included the scheduling and preparation of construction contract conditions necessary to satisfy federal, state, and resource agencies for construction of hydraulic control structures, improvements to power houses and fish facilities on the McKenzie River. Improvements included:

- Walterville Fish Screen and Tailrace Barrier
- Leaburg Fish Screen Improvements and Tailrace Barrier
- Leaburg Dam Fish Ladder Reconstruction and Improvements
- Leaburg Dam Gate Improvements

Brett served as construction manager for the above projects and assisted with upgrades to the Leaburg and Walterville Powerhouses. He served as design manager for the Leaburg Tailrace Barrier and the Leaburg Dam Gate Improvement Project.

Evergreen Highway Corridor Project, City of Vancouver, Washington

Project Manager. The project provided for the planning and design for the 1.5-mile-long corridor for water and sewer systems extension into a developing corridor. The project included basin master planning for water, sewer, and storm water facilities and development of concept plans for roadway and pedestrian facilities along the corridor.

Kellogg Creek WPCP Solids Process System Improvements, Water Environment Services, Clackamas County, Oregon

Construction Manager. Third-party construction manager for a solids handling system improvement project design by others. Screw thickener and sludge pumping improvements were preformed in the digester complex.

Odor Control, Kellogg Creek Wastewater Treatment Plant Improvements, Water Environment Services, Clackamas County, Oregon

Project Manager. The odor control improvements provided for collection of foul air from all process areas and treatment employing biofilter technology. The project provided for collection of all liquid train odors upstream of the aeration basins; the anoxic zones of the aeration basins and the waste activated sludge thickening facilities. Odor confinement, conveyance and treatment systems were designed for 21,000 cfm capacity with provisions to expand to 30,000 cfm. The project was accomplished through two equipment pre-purchase contracts and one construction contract to meet the client's schedule commitments. The biofilter treatment system is considered one of most successful in the Pacific Northwest. The initial wood media lasted at record 10 years. Brett also assisted WES with replacement of the media earlier this year.

The project also provided a biofilter at the Arrah Wanna Pump Station, the main conveyance pumping facility serving the Hoodland plant.

Orange County Wastewater Reclamation and Ground Water Replenishment, Orange County Sanitation District, California

Project Engineer. Brett served as interim area resident engineer for reverse osmosis, ultraviolet light disinfection and product water pump station. The project reclaimed 70 mgd of secondary wastewater effluent and treated it to near drinking water standards for employment to recharge a ground water aquifer and to create a groundwater barrier to prevent saltwater intrusion into the water system supply aquifer.

Outfall Improvements, Columbia Boulevard Wet Weather Treatment Facility, Bureau of Environmental Services, Portland, Oregon

Technical Lead. The project provided for improvements to the City's outfall conveyance and discharge systems to provide system capability to convey and diffuse 36-mgd of combined dry and wet weather flows in the Columbia River. The project included an 84-inch-diameter, 2,000-foot-long underwater siphon crossing of the Oregon Slough, a 96-inch diameter, 6,000-foot-long land crossing of Hayden Island, and an 84-inch diameter 1,000-foot-long underwater outfall pipe extending into the River, ending with a new 400-foot-long diffuser. The outfall system serves as chlorine contact element for disinfection of effluent from the City's Columbia Boulevard Wastewater Treatment Plant. The project was coordinated with effluent pumping and de-chlorination facilities designed by others. Critical schedule constraints were met through detailed planning within limited in-river work windows.

Phase 4B, Durham Advanced Wastewater Treatment Plant, Clean Water Services, Oregon

Project Engineer. Brett served as project engineer for the civil and odor control elements at the wastewater treatment plant. The project provided for collection interceptor system improvements, new 180 mgd influent pump station (expandable to 240 mgd), new 42- and 54-inch diameter influent force mains, metering facilities, and their interface to the existing headworks facilities and the existing and future primary sedimentation facilities. The odor control system addresses new facilities with confinement, conveyance and biofilter treatment.

Pump Station Upgrade, Bear Creek Valley Sanitary Authority, Medford, Oregon

Project Manager. Brett was the project manager for engineering design, procurements, and construction services of the Kirtland Pump Station Upgrade Project. The project upgraded the raw sewage pumping capacity from 11 to 18 mgd with a design for future pump station/force main capacity of 44 mgd. The project provided for rebuilding 20-year-old pumps, new motors and variable frequency drives and control systems. Connected motor load is 900 hp expandable to 1500 hp.

Quality Control Review, Tri-City WPCP Liquid Expansion Project, Water Environment Services, Clackamas County, Oregon
QC/Peer Reviewer. At clients request Brett preformed a QC review of bid documents prepared by another consultant for a proposed 4 mgd liquids process expansion to the treatment plant.

The Dalles Lock and Dam, Sluiceway Guidance Improvement Devices, US Army Corps of Engineers, Oregon
Technical Lead. Brett served as technical leader for the preparation of the design documentation report for the project. It enhanced downstream juvenile fish passage away from turbine intakes and directed them to the ice and trash sluiceway. The facilities included deployable J-frames and intake blocks along a 2,200 ft long powerhouse intake structure to form a U-shape passage below the water surface. This prevents juvenile fish from moving down towards turbine intakes and directs them into the sluiceway. The devices are to be deployed seasonally during migration season and stored above water during non-migration season. Each of the 22 main turbine units, the two fish turbine units, and the two station service units are to be retrofitted with sets of J-frames, blocks, and intake roof structures at each of the 73 intake bays. A new rail-mounted deck crane was designed to service the improvements, the trash raking systems, and to perform routine maintenance functions at the dam.

VFD and Digester Mixing System Improvements, Tri-City and Kellogg Creek WPCP Influent Pump Station, Water Environment Services, Clackamas County Oregon
Project Manager. Replacement of variable frequency drive equipment serving 725hp of influent pumps at the Kellogg Creek WPCP, 800 hp of influent pumps at the Tri-Cities WPCP and a future upgrade to 1,100 hp. The project also included adding variable frequency drives to digester mixing pumps for the two anaerobic digesters. Ancillary improvements accomplished under the project included seismic retrofit of the Tri-City influent pump station designed by another party.

Wastewater and Water Facility Improvements, City of Vancouver, Washington
Project Manager. Brett was the Project Manager for third-party construction management services on City of Vancouver wastewater and water improvement projects. Projects included are:

- Marine Park Water Reclamation Facility and Effluent Treatment Complex
- Westside Wastewater Treatment Plant Solids Handling Improvements
- Ellsworth Springs Water Supply and Treatment Facility
- Westside 2000 Program Solids Processing and Effluent Treatment Facilities
- Westside 2000 Program Primary and Secondary Treatment Facilities

Brett also served as design and construction manager for the upgrade of the City's solids incineration facilities. This was a fast track project involving five pre-purchased bid packages and one construction contract.

Wastewater Treatment Facility Pretreatment Improvements, Metropolitan Waste Management Commission, Eugene/Springfield, Oregon
Design and Construction Manager. Pretreatment improvements for the 49 mgd ADF and 195 mgd PWWF facility were executed. Project improvements included replacement of comminutors with screenings removal and handling facilities, replacement of grit pumping and handling facilities, a new 16,000 cfm biofilter odor control facility, and improvements to existing odor control facilities.

Wastewater Treatment Facility Gravity Belt Thickener Waste Activated Sludge Thickening Project, Metropolitan Waste Management Commission, Eugene/Springfield, Oregon
Design and Construction Manager. A new gravity belt thickener facility was constructed. Project improvements include replacement of existing dissolved air floatation thickener with new gravity belt thickener facility including new waste activated sludge pumping, thickened waste activated sludge pumping, polymer addition,

and provisions for a 1/3 capacity increase as well as future additions of odor control at the implemented facility.

Wastewater Treatment Plant Expansion, Hampton Roads Sanitation District, Hampton Roads, Virginia

Project Design and Construction Manager. Facilitated design and construction of an expansion at the Williamsburg Wastewater Treatment Plant in Williamsburg, Virginia. The project included construction of 20 new process facilities and modifications of 16 existing process facilities, which increased plant capacity from 10 to 22 mgd. The headworks and disinfection facilities were provided to accommodate expansion to 30 mgd. The activated sludge process modifications included replacement of mechanical aerators with three 600 hp blowers; installation of a new diffused air system with controls based on dissolved oxygen demands; and three 160 foot diameter secondary clarifiers with new RAS and WAS pumping facilities. Construction sequencing constraints were incorporated into the construction. Additionally, the project provided for collection and treatment of over 200,000 cfm of odorous air employing dual stage packed bed chemical scrubbers (chlorine and caustic). The improvements to the plant included plant-wide replacement of main flow conveyance pipelines, power distribution system and SCADA system

Wastewater Treatment Plant Expansion, Marrero, Jefferson Parish, Louisiana

Project and Resident Engineer. The project converted the existing trickling filter plant to the trickling filter/solids contact process and increased plant capacity from 3 to 10 mgd. The project included new headworks facilities with odor control, two primary clarifiers and associated sludge pumping facilities, two tricking filters, tricking filter/secondary treatment pump station, solids contact basin with associate blower station, two secondary clarifiers and sludge pump station, new chlorine disinfection facilities, anaerobic digester, belt press dewatering and dewatered sludge truck loading facilities.

Wet Weather Flow Relief Diversion, East Bay Municipal Utility District, Oakland, California

Predesign Engineer. The project provided a weather flow relief diversion to a new 51 mgd pump station with integral screening, grit removal and chlorine disinfection facilities discharging through a new 54-inch diameter outfall and diffuser to the Oakland Inner Harbor.

Westside Wastewater Treatment Plant, City of Vancouver, Washington

Design and Construction Manager. In this fast track project, Brett served as a design/construction manager for the upgrade of the City's solids incineration facilities to meet EPA 503 regulations. The project was accomplished employing five equipment pre-purchase bid packages and one construction contract to meet the client's schedule obligations.

Zone II Pump Station and Force Main Program, Jefferson Parish, Louisiana

Project Design Manager. Twelve construction contracts provided to decommission three existing wastewater treatment plants, convey flow to a central treatment facility, and convey treated plant effluent to an outfall in the Mississippi River. The improvements included six pump stations with capacities ranging from 1 to 60 mgd and 15 miles for force mains ranging in diameter from 6 to 48 inches. The project was accomplished within the client's obligations under an EPA consent decree.

Experience Summary

Tom Lebo has 32 years of experience in the construction and operations of water, waste water and process facilities. His responsibilities include construction management, project management, project engineering, field supervision, and estimating. Tom served as Brown and Caldwell's construction manager on numerous water treatment and wastewater treatment plant upgrades. Tom has worked on projects using various delivery methods including traditional design-bid-build, Construction Manager/General Contractor (CM/GC) and Design-Build.

Assignment

Education

B.S., Construction Engineering, Iowa State University, 1979

Registration

Experience

32 years

Joined Firm

1992

Relevant Expertise

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Construction Management Services, Water Treatment Plant Upgrade and Expansion, Lake Oswego-Tigard Water Partnership, City of Lake Oswego, Oregon

Construction Manager. Tom is providing constructability and quality reviews during the design of the upgrade and expansion of an existing water treatment plant. This is an estimated $75 million construction project that is currently being designed by another engineering firm. Tom's role includes reviewing the construction cost estimate, draft construction schedule, drawings and specifications at each of the design milestones. Tom will be the onsite construction manager when construction begins which is expected to be late in 2013.

UV Basis of Design Report, Portland Water Bureau, City of Portland, Oregon

Constructability Review. Brown and Caldwell was retained by the PWB as part of a team of consultants to assist with the preparation of the Basis of Design Report (BODR) for the planned 212 mgd drinking water UV disinfection project to be located in the Bull Run watershed. Tom provided constructability review, value engineering review, project schedule, and cost estimation for the conceptual designs provided by the other 2 major consulting teams employed by the PWB for the project.

Construction Management Services, Klineline Pump Station Project and Phase 4 Expansion of the Salmon Creek Wastewater Treatment Plant, Clark County, Washington

Construction Manager. Tom provided construction management for the Klineline Pump Station and the Salmon Creek Wastewater Treatment Plant Phase 4 Expansion. Both of these projects are part of the Salmon Creek Wastewater Management System Phase 4 Expansion for Clark County, Washington. Klineline Pump Station is an 18.4-million gallon per day peak flow sewage pumping station. It is being constructed within an existing county park. It includes a reinforced concrete wet well/dry well and superstructure, five 250 hp raw sewage pumps, standby generator, underground piping, and a residence for the park watchperson. The Salmon Creek WWTP Phase 4 Expansion Project will increase the capacity of the Salmon Creek Wastewater Treatment Plant from 10.3 million gallons per day to 14.95 million gallons per day. It includes a new primary clarifier, aeration basin, secondary clarifier, digester mixing improvements, increasing the capacity of the UV disinfection system, addition of effluent pumps, and other process improvements at the existing treatment plant. Both projects are under construction at the same time and were completed in August 2009.

Construction Management Assistance, Influent Pump Station 2, Headworks, and Willakenzie Pump Station Modifications, Metropolitan Wastewater Management Commission (MWMC), Eugene-Springfield, Oregon
Construction Manager. Tom provided construction management assistance for this $22 million project to add a new influent pump station, headworks and make modifications to an existing pump station. The purpose of the project was to increase the plants influent pumping capacity to 277 mgd. Project was completed using the CM/GC contracting method in order to meet the fast track construction schedule.

Construction Management Services, Little Cottonwood Water Treatment Plant, Metropolitan Water District of Salt Lake and Sandy, Utah
Construction Manager. Tom provided construction management services for all work at the Little Cottonwood Treatment Plant during a 3 year, $35 million program to upgrade process and increase plant capacity. The project includes conversion of the facility from chlorine to ozone for primary disinfection, adding grit and screening facilities, addition of a 10 million-gallon finished water storage reservoir, and 120 million gallons per day finished water pumping station.

Design/Build Construction Services Biosolids Facility Upgrade Project, Clackamas County, Oregon
Project Manager. Tom was responsible for design, procurement, and construction of a biosolids thickening and dewatering facility for the Tri-City Water Pollution Control Plant (WPCP) located in Oregon City, Oregon. This $4.45 million project added two gravity belt thickeners for waste activated sludge and recuperative thickening, and a high speed centrifuge for dewatering. The project also included a truck loading area, improvements to the existing digester mixing, electrical, controls, start-up, testing, and modifications to the computerized operations and maintenance manual.

Construction Management Services, Facility Improvements Project, City of Woodburn, Oregon
Construction Manager. Tom provided construction management during the renovation and expansion of the existing treatment plant. The project included construction of a new headworks, an upgrade to the two existing primary clarifiers, and the addition of a complete secondary treatment system, including aeration basins, blower building, three secondary clarifiers, effluent filters, and ultraviolet (UV) disinfection. Solids processing was also upgraded with renovated digesters, new dissolved air flotation thickeners, new facultative sludge lagoons, and new storage lagoons.

Construction Management Services, Forest Grove/Hillsboro Plant Improvements, Clean Water Services, Forest Grove and Hillsboro, Oregon
Construction Manager. Tom provided construction management services for the $20 million upgrade for two existing waste water treatment facilities. Major improvements included activated sludge and aeration systems upgrade, modification and construction of secondary clarifiers, replacement of chlorine disinfection with medium pressure UV disinfection for Level II reuse, effluent pumping, and a high head pumping station. Operations of the existing treatment plants had to be maintained throughout the construction process.

Construction Management Services, Wastewater Treatment Plant Improvements, City of Gresham, Oregon
Construction Manager. Tom provided construction management services for the $20 million upgrade of the treatment facility. The project included a new influent diversion structure, headworks, primary clarifiers, aeration basin, blower building, and secondary clarifier. Modifications were made to the existing aeration basins, RAS pumps, anaerobic digester, dewatered sludge loading area and biosolids storage area.

Construction Management Services, Facility Upgrade, City of Florence, Oregon
Construction Manager. Tom provided construction management services for the $10 million upgrade of the treatment facility comprised of major improvements and the expansion of existing activated sludge plant. Upgrades included new headworks, aeration, secondary clarifiers, UV disinfection, outfall, fixed submerged cover anaerobic digester, and centrifuge dewatering.

Construction Management Services, Green River/Rock Springs Water Plant, Green River, Wyoming
Construction Manager. Construction management assistance was provided during the construction of this $30 million drinking water treatment facility for the cities of Green River and Rock Springs, and Sweetwater County.

Construction Management Services, Pollution Control Facility Upgrade, City of Grants Pass, Oregon
Construction Manager. This was a design/build, fast-track project to add a second UV disinfection channel to the existing treatment facility. Brown and Caldwell Constructors was the general contractor for design and construction of these improvements.

Construction Management Services, UV Disinfection System Expansion, City of Seaside, Oregon
Construction Manager. Tom provided construction management services for this design/ build project to add a UV disinfection system to the existing treatment facility. Brown and Caldwell Constructors was the general contractor for design and construction of these improvements.

Construction Management Services, Biological Nutrient Removal Optimization Project, Clean Water Services, Washington County, Oregon
Construction Manager. This was a design/build, fast-track project to improve biological nutrient removal at the Durham, Oregon facility by adding volatile fatty acids pumps, piping, and controls. Brown and Caldwell Constructors acted as general contractor for design and construction of these improvements.

Construction Management Services, SBR Treatment Facility, Foster Farms, Creswell, Oregon
Construction Manager. Tom provided construction management services for this design/ build project to build a sequencing batch reactor treatment facility, treated effluent storage lagoon, 3 miles of pipelines and 200 acre irrigation system for this poultry processing facility. The project was fast tracked to insure the plant remained in compliance with its discharge permits.

Construction Management and Inspection/Observation Services, Corvallis Wastewater Reclamation Plant Improvements, City of Corvallis, Oregon
Construction Manager. Tom provided construction management and inspection services for improvements to the influent pump speed controls and replacement of the vertical drum screen with a bar screen.

Construction Management Services, Headworks Project, Clean Water Services, Oregon
Construction Manager/Resident Engineer. Construction of two Brown and Caldwell design projects was administered at existing operating plants in Hillsboro and Forest Grove, Oregon. Construction costs for both plants was $4 million.

Construction Management Services, Forest Grove High Head Pumping Station, Clean Water Services, Oregon
Construction Manager/Resident Engineer. Provided construction management and inspection services during construction of a $3 million Brown and Caldwell design, adjacent to the headworks at the Forest Grove facility.

Construction Management Services, Forest Grove-Rock Creek Pipelines, Clean Water Services, Oregon
Construction Manager/Resident Engineer. Provided construction management and inspection services during construction of a $6.2 million, 9-mile-long, dual 24-inch-diameter pipeline designed by Brown and Caldwell and completed in 5 months.

Construction Management Services For Small, Concurrent Projects, Clean Water Services, Oregon
Construction Manager/Resident Engineer. Projects include:

- Forest Grove/Hillsboro Irrigation and Outfall Improvements
- Durham Influent Pump Variable Frequency Drive Replacement
- Banks Pumping Station
- Banks Force Main
- Enschede Pipeline, Hillsboro
- Forest Grove Effluent Irrigation Demonstration Project

Prior to joining Brown and Caldwell, Tom worked for construction contractors as a Manager of Construction and Operations, Project Manager, Field Superintendent and Project Engineer on wastewater treatment, water treatment, solid waste, oil processing, and power plant projects. These include:

Hyperion Energy Recovery System, Kiewit Pacific Co., City of Los Angeles, California
Project Manager. For 18 months, Tom managed construction of a $70 million contract to build a Carver-Greenfield facility, converting sewage sludge to boiler fuel. Work included making modifications to the facility while the plant was in operation, providing maintenance services, and material procurement for the City of Los Angeles.

Construction of Headworks No. 2., Kiewit Pacific Co., Orange County Sanitation District, Orange County, California
Mechanical Superintendent. This $30 million contract added a new headworks to an existing treatment plant, including influent pumps, bar screens, grit removal, and influent metering.

Construction of Santa Teresa Water Treatment Plant, Kiewit Pacific Co., Santa Clara Valley Water District, San Jose, California
Field Superintendent. Tom was responsible for construction of the operations/chemical feed/maintenance building and coordination of electrical and instrumentation subcontractors on this $50 million new water treatment facility.

Memberships

National Society of Professional Engineers
Construction Specifications Institute, CDT
National Association of Corrosion Engineers (NACE)

ROBERT G. JOSSIS, P.E.

Experience Summary

Bob Jossis has 38 years of experience in planning, design, and construction management of civil and wastewater engineering projects with emphasis on municipal public works and industrial facilities. His background includes master utility plans, wastewater, facility plans, design of wastewater collection, trunk/interceptor and effluent outfall systems, urban storm drainage systems, combined sewer separation facilities, and wastewater disposal through land application. Bob's experience also includes water supply development, pumping, transmission, distribution and storage, and fisheries facilities engineering.

Assignment

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Education

B.S., Civil Engineering, Oregon State University, 1971

Registration

Professional Engineer — Washington, #20101 - 1978; Oregon, #8478 - 1975

Experience

38 years

The first four projects were completed as Robert G. Jossis Consulting. The balance were performed as a consultant with Montgomery Watson-Harza (MWH) and focus on his potable water background.

Water Supply Development and Implementation, Port of St. Helens, OR

Under subcontract to MWH, Bob is the Owner's Representative/Project Manager for the design/build of a $3.1 million horizontal collector well and pumping station facility for the Port of St. Helens at its Port Westward Industrial Park. The project was recommended in the Water Supply Conceptual Plan for the Port which was previously completed by MWH and for which Bob also served as Project Manager. The water supply system will provide process water for a new ethanol production plant currently under construction at the Port, a potential new power plant, and other industrial users at Port Westward.

Status: Ongoing

References: *Gerry Meyer, Port of St. Helens Interim Executive Director 503/397-2888*
Tom Fuller, Port Consultant Project Manager–Shiels/Obletz/Johnsen, 503/242-0084

Balch Consolidation Conduit, City of Portland, Bureau of Enviornmental Services (BES), Kennedy/Jenks (K/J) Consultants

Under subcontract to Kennedy/Jenks (K/J) Consultants, Bob is serving as K/J's Project Manager for the Balch Consolidation Conduit (BCC) Project. The BCC Project consists of approximately 6,500 feet of 84-inch-diameter pipeline constructed by micro tunneling.

Status: Ongoing

References: *Rob Cozzi, Project Manager, City of Portland BES, 503/823-7095*
Brad Moore, Technical Director, K/J Consultants, 503/295-4911

Industrial Rail Project, Port of St. Helens, OR

Under subcontract to K/J, Bob is the Owner's Representative/Project Manager for implementation of a $6.5 million railroad development project for the Port of St. Helens at its Port Westward Industrial Park. He is responsible for preparing bid packages for early materials procurement and procurement of construction contractors. He is also the Port's representative for coordination of project implementation with the design consultant, inspectors and construction contractors.

Status: Ongoing

References: *Gerry Meyer, Port of St. Helens Interim Executive Director 503/397-2888*
Tom Fuller, Port Consultant Project Manager–Shiels/Obletz/Johnsen, 503/242-0084

Emergency Woods Trunk Sewer Rehabilitation/Relocation Project, BES

Bob served as Project Manager for BES on the $14 million Woods Street Trunk Sewer Emergency Rehabilitation/Relocation Project. The Woods Street Trunk Sewer is a 24- to 36-inch-diameter brick and stone combined sewer constructed in the early 1900s. The sewer passes beneath Interstate 5, Barbur Boulevard, Naito Parkway, and an approach to the Ross Island Bridge in southwest Portland. The deteriorated sewer collapsed in late 2005, resulting in sink holes and surface settlements along the sewer alignment. The City of Portland implemented a diversion and bypass system consisting of a series of three temporary pumping stations and nearly 2 miles of 8- to 18-inch-diameter ground surface pipelines to divert the flows to other trunk lines in the collection system. The City also retained design consultants and a construction contractor to plan, design, and construct a new Woods Trunk Sewer in addition to rehabilitating portions of the original Woods Trunk line while decommissioning the remainder of the old system.

Status: Completed 2006

References: *Mark Hutchinson, Construction Division Manager, City of Portland BES 503/823-7113*
Bill Ryan, Chief Engineer, City of Portland BES 503/823-7203

Clackamas River Pumping Station/Pipeline Project, South Fork Water Board, Oregon City, OR

As Project Manager for preparation of a Water Supply/Pumping/Treatment Master Plan and Capital Improvements Program for the South Fork Water Board (Cities of Oregon City and West Linn, Oregon), Bob was responsible for Phase 1 of the Master Plan implementation which included predesign, design, permit and easement acquisition, and construction management services for a new 20 million gallons per day (mgd) water intake and pumping facilities in the Clackamas River, 42-inch-diameter raw water transmission line, upgrading/expanding an existing treated water pumping station to 16 mgd, and a new system-wide instrumentation/control system.

Status: Completed 2007

Reference: *Dan Bradley, now General Manager for Oak Lodge Water District, 503/654-7765*

Leaburg-Walterville Project Improvements, Eugene Water & Electric Board (EWEB), Eugene, OR

As Project Manager, Bob is responsible for planning, design, and support services during construction of the $42 million Leaburg-Walterville Hydropower Facilities Relicensing and Improvements Project. Fisheries enhancement and mitigation projects incorporated modifications to existing fish ladders, a new fish screen, expansion/modification of an existing fish screen, fish barriers, and an innovative rock weir for diversion of McKenzie River water to the Walterville Hydropower Plant. Hydropower plant improvements included new turbines, generator rewinds, and a new automation system for the integrated hydropower production and fisheries facilities. The design also included modifications to the Leaburg Dam roll gates and other gates. Extensive consultation was conducted with environmental, permitting, and regulatory agencies throughout the planning and design process.

Status: Ongoing

Reference: *Gale Banry and Marc Anderson, EWEB, 541/484-2411*

Gillette-Madison Water Supply Project, City of Gillette, WY

Bob acted as Project Engineer on a water master plan that included the design and construction management of an eight-well well field, 7,000 gallons per minute pumping stations, two 1 million gallon reservoirs, and 40 miles of 30-inch water transmission line.

Water Supply Master Plan, Butte Water Company, WY

Bob acted as project Manager for the water master plan for the Butte Water Company and Butte-Silver Bow Government in Butte, Montana. His responsibilities included evaluation of supply, treatment and transmission alternatives, and distribution system improvement requirements. Seventy-four separate supply, treatment, and transmission alternatives were evaluated.

Teresa L. Buchholz, P.E., C.W.R.E.
Strategist, Facilitator, Senior Project Manager

Education
B.S., Civil Engineering, University of Nebraska Lincoln, 1983
Registration
Professional Engineer, 2001, Oregon (66820PE)
Professional Engineer, 2001, Washington (37671)
Professional Engineer, 1988, Nebraska (E 6616)
Certification
Certified Water Rights Examiner 2001, Oregon (66820CWRE)
Professional Affiliations
American Society of Civil Engineers (ASCE)
American Publics Works Association (APWA)
American Water Works Association (AWWA)
Society of American Military Engineers (SAME)
Oregon Association of Clean Water Agencies (ACWA)

Ms. Buchholz is the principal for Integrated Water Solutions. She has extensive experience in managing complex environmental and water resource projects, and has pioneered effort in Oregon with respect to Collaborative Environmental Process for acquiring environmental permits and clearance on complex, high profile water resources projects. Ms Buchholz has extensive experience developing strategy, facilitating, managing and preparing NEPA and other environmental documentation for water resource projects.

Lake Oswego Tigard Water Partnership, Lake Oswego and Tigard, Oregon
The Lake Oswego Tigard Water Partnership is in the process of expanding Lake Oswego's existing drinking water infrastructure so that it can serve both communities. The Partnership has hired a Brown and Caldwell to provide program management, construction management and permitting services. Ms. Buchholz is the permitting task lead for the program management team. As the permit task lead Terry is leading the environmental strategy, coordination and development of ESA consultation documentation (BA), the water rights strategy development, and securing all the required environmental permits and clearances.

Tualatin Basin Water Supply Project, for Clean Water Services and the Tualatin Basin Water Supply Partners, Washington County, Oregon
The Tualatin Basin Water Supply Project (TBWSP) is intended to help meet the growing water demands of the greater Washington County community. Alternatives include raising Scoggins Dam to increase reservoir capacity, a raw water pipeline and pumpback system from the Tualatin River, and the potential for a pipeline from the existing treatment facility on the Willamette River. IWS is retained by CWS to manage the NEPA and environmental compliance aspects of the project, lead the Collaborative Environmental Process and develop a water rights strategy.

Cascade Pacific Pulp Intake Analysis and Permitting, Cascade Pacific Pulp, Halsey, Oregon
Cascade Pacific Pulp has hired a Brown and Caldwell and Integrated Water Solutions to investigate and permit a long-term solution for intake structure. Over the past 12 years the evolving geomorphology in this stretch of the Willamette River has formed an island in front of the existing intake. During low flow periods, the intake cannot withdraw the needed volume of water. Terry Buchholz has been working with the Corps, DSL, and NMFS to develop an acceptable solution that will meet the water demands of the Cascade Pacific Pulp and comply with both the Endangered Species Act and Section 404 of the Clean Water Act.

Oregon Stream Mitigation Framework, USEPA and USACE, Portland District
Ms. Buchholz was responsible for designing and facilitating three workshops that are being used to frame the development of a Stream Mitigation Framework for Oregon. The first technical workshop explored the current state of the science and technical considerations regarding key aspects of stream mitigation, including functional assessment, site selection, and performance standards and established dialog and cooperation among federal, state, and local agency partners in developing a stream mitigation framework for Oregon. The second policy workshop convened policy staff of partner agencies to review the opportunities and constraints associated with the

many facets of stream mitigation (avoidance, minimization, and compensatory mitigation), from the perspective of each agency's mission, authority, existing policy, and local implementation practices and came to agreement on a path forward for both resolving policy obstacles and taking advantages of opportunities, so that an integrated stream mitigation framework can be developed and then implemented. The third workshop convened stream classification experts to develop a coarse, rapid and automated stream classification system that will be a key component of the Oregon Stream Mitigation Framework.

Water Plans, for the City of Salem, Oregon
As project manager, Ms. Buchholz, was assisting the City of Salem in securing a safe, long-term water supply through the update of the City's master plan. Salem's water management has become a complicated venue of water rights, complex regulatory issues, water quality and treatment, fervent stakeholder groups, and assured supply. This complicated planning effort included, updating population and water demand forecasts, developing long-term alternative water supply strategies, refining current water conservation plan, developing long-term water rights strategies, and evaluating and recommending adjustments to their financial program.

Aquifer Storage and Recovery (ASR) Optimization Studies, for the City of Salem, Oregon
As project manager, Ms. Buchholz led the ASR Optimization Studies that included evaluation of the hydraulic intertie, evaluation of the water quality issues, evaluation of blow-off water disposal, evaluation of the monitoring and permitting requirements, development a conceptual monitoring plan, evaluation of the ASR electrical system, and development of the an operations and maintenance plan.

Watershed Management Plans, for the City of Salem, Oregon
Ms. Buchholz was the project manager for environmental engineering and surface water projects for the City of Salem. The focus of these projects includes completion of Watershed Management Plans and Total Maximum Daily Load (TMDL) Implementation Plans. These projects were initiated by the City, recognizing the increasing regulatory compliance requirements and the expanding public service and development demands that the City must address. As a result, the City is integrating its activities under an "integrated watershed management strategy" (watershed strategy) to optimize and make more efficient the ability of the different departments to meet these demands.

Source Water Protection Plan, City of Salem, Oregon
Ms. Buchholz served as project manager and project engineer in the preparation of a source water protection plan for the city of Salem, Oregon. Salem's drinking water comes from the North Santiam River, which has a 490,000-acre watershed that is part of the Mt. Jefferson Wilderness in the Cascade Mountains. Additionally, the source water assessment included a wellhead protection plan for the city's aquifer storage and recovery well system that serves as a supplemental source of water during the peak summer months. Tasks to complete the plan included the delineation and inventory of potential sources of contamination and a susceptibility analysis. The plan also outlined the public outreach program that was implemented in the watershed.

Ethan J. Rosenthal

Ecologist, Project Manager

Education

M.S., Environmental Science (Water Resources Emphasis), 1998, Indiana University

B.S., Agricultural Economics, 1992, Cornell University

Continuing Ed. Coursework, Portland State University

- Wetland Delineation
- Wetland Mitigation
- NW Plant Identification

GIS Skills

GIS: ARCMap

GPS: Trimble GeoXH and Pathfinder GPS receivers, Pathfinder Office software

Community Service

Volunteer photographer for Oregon Public Broadcasting

Former advisory committee member, Lower Willamette Climate Preparedness Project, Climate Leadership Initiative

Mr. Rosenthal has more than twelve years of experience working in the field of applied ecology, taking on project management, task leader, and technical roles. He has worked on a wide array of projects, from wetland permitting for restoration projects to water use/water quality investigations, watershed assessments, and large-scale habitat restoration and conservation projects. Mr. Rosenthal has training and experience in wetland delineation, natural resource functional assessment, Section 404 Clean Water Act and Oregon Removal-Fill permitting, ecological restoration, aquatic ecology, NEPA, ESA, and water quality issues. He has experience in public outreach and community involvement. He is also an avid photographer, specializing in nature and landscape photography that has been incorporated into project work.

Lake Oswego-Tigard Water Partnership, Oregon

Mr. Rosenthal is the senior ecologist for this joint community water supply project. The cities of Lake Oswego and Tigard propose to expand and improve the existing water collection, roughly 10-miles of transmission pipelines, and treatment system to meet increasing future water demand. Project elements cross multiple local jurisdictions. DEA is providing wetland delineation and permitting, ESA, ecological mitigation, and local land use support services to the project team.

Barkley Springs Restoration, for the Klamath Watershed Partnership, Upper Klamath Basin, Oregon

Ethan worked with the Klamath Watershed Partnership and other stakeholders on a complex design effort to restore spawning habitat for the endangered Lost River and Shortnose suckers at Barkley Springs, adjacent to Upper Klamath Lake. Mr. Rosenthal led the Section 404 Clean Water Act and Oregon Removal-Fill Law permitting efforts.

Clackamette Cove Bank Stabilization Monitoring, City of Oregon City.

Mr. Rosenthal was the project manager for the five year monitoring effort for an approximately 200 foot long bank stabilization project along the Clackamas River. DEA provided permitting and design work in addition to the five years of monitoring. Monitoring was required as part of the ESA consultation and USACE Section 404 permit.

Williamson River Delta Restoration, for The Nature Conservancy, Klamath Basin, Oregon

Mr. Rosenthal provided a wide array of environmental compliance support services for this 7,000 acre wetland habitat restoration project. DEA provided senior project management and environmental compliance services for the project, which the Oregon State Land Board recognized by awarding it the 2007 Wetland Award. Mr. Rosenthal was co-author of the environmental impact statement. He obtained federal and state take permits required for the restoration activities. He also coordinated with the U.S. Army Corps of Engineers and Oregon Department of State Lands to obtain federal Section 404 and state removal fill permits for over one million cubic yards of earthwork. He conducted the wetland delineation for the 7,000 acre site, which utilized existing GIS based data complemented by field verification. Mr. Rosenthal presented an electronic poster describing project history and lessons learned at the River Restoration Northwest Symposium in 2007.

Troutdale Reynolds Industrial Park, Port of Portland, Troutdale, Oregon
DEA provided environmental project management services, including developing and implementing a strategy for permitting, for the development of Phase 1 of the Troutdale Reynolds Industrial Park (TRIP). Mr. Rosenthal was the lead DEA biologist during preliminary development planning of the entire TRIP site, was the wetland task lead and organized the wetland delineation for the 700 acre site, and lead wetland mitigation planning associated with USACE and DSL permitting for Phase 1 development.

Threemile Canyon Wind Project, Momentum Renewable Energy, Inc., Morrow County,Oregon
Mr. Rosenthal was the project manager for DEA. DEA provided permitting and support services for a small scale (15MW) wind farm project near Boardman, Oregon. Work included wildlife and habitat surveys, pre-construction avian use surveys, local land use permitting, land survey, and GIS mapping and turbine micro-siting support.

Tualatin Basin Water Supply Project, Clean Water Services, Oregon

DEA is leading the NEPA-EIS efforts for this important regional water supply project, which seeks to meet Washington County's future water needs. Mr. Rosenthal is the wetland task lead, which has involved coordinating wetland delineation crews, performing wetland functional assessments using the Oregon Rapid Wetlands Assessment Methodology (ORWAP), mitigation planning, and collaborating with a resource agency working group. The study area for the project is well over 1,000 acres and covers forested coast range foothills and agricultural bottomlands.

Marine Gateway Projects, for the Port of Coos Bay, Oregon
DEA is providing interdisciplinary services for several major Port of Coos Bay improvement projects, including new marine terminals, navigation channel improvements, and a new deep draft cargo shipping facility. Mr. Rosenthal is working as the ecological mitigation task lead for these projects, including preparation of feasibility analysis and coordination of mitigation design, which could require several hundred acres of freshwater, estuarine, and upland habitat mitigation.

Phil R. Rickus

Ecologist

Education
Biology (Cum Laude) 1992, Valparaiso University
Relevant Training
Wildlife Linkage Workshop, 2007
River Restoration, PartII: Ecological Processes, 2007
Hydrogeomorphic (HGM) Assessment, DSL, 2006
Marbled Murrelet Training, WADFW, 2004
Wetland Plants of the Pacific Northwest, PSU Professional Dvpt. Center (PSU), 2003
Wetland Mitigation, Construction and Installation, PSU, 2002
Basic Wetland Delineation Training, PSU, 2000
USDA Forest Service Northwest Amphibian Training, 1996 and 1998
USDA Level Two Quantitative Site Characterization and Vegetation Sampling, Basic and Advanced, 1997
USDA Neotropical Migratory Songbird Sampling Techniques, 1995, 1996, and 1997
USDA Rosgen Stream Channel Typing and Vegetation Analysis, 1997
Red Cross First Aid and CPR, 1995-2007
Professional Affiliations
Society of Wetland Scientists, 1999-present
Society for Ecological Restoration, 1999-present
Oregon Association of Environmental Professionals, 1998-present
Oregon Chapter of the Wildlife Society, 2001-present
GIS/GPS Skills
ArcView and Trimble GeoXH and XT

Years of Experience
15

Mr. Rickus is an ecologist with more than 15 years of experience with living systems in the west. He has led vegetation mapping, TES plant and wildlife surveys, and wetland delineation and mitigation efforts for a diverse range of built and natural infrastructure projects both east and west of the Cascades Mountains, as well as in Alaska, Montana and New Mexico. Experience includes project manager and task leader roles for wetland, grassland, and riparian restoration projects, as well large and small-scale projects requiring NEPA and Energy Facility Siting Council (EFSC) review. Strong analysis and writing skills have been refined during ten years with DEA.

Lake Oswego-Tigard Water Partnership, Oregon
Mr. Rickus is the senior ecologist responsible for performing and documenting the wetland delineations and sensitive land evaluations for this joint community water supply project . The cities of Lake Oswego and Tigard propose to expand and improve the existing water collection, roughly 10-miles of transmission pipelines, and treatment system to meet increasing future water demand. Project elements cross multiple local jurisdictions. DEA is providing wetland delineation and permitting, ESA, ecological mitigation, and local land use support services to the project team.

Highway 35 Improvement Project, for the Federal Highway Administration, Mt. Hood, Oregon
Highway 35 is a major state highway providing regional transportation service as well as access to the Mt. Hood National Forest and other destinations. Damage caused by debris flows from the slopes of Mount Hood has resulted in frequent and costly repairs over the last 20 to 30 years, placing a severe burden on the limited resources available for road repairs and negatively affecting the natural environment. DEA is providing all environmental services for repair of the highway, including ESA, NEPA, and FS coordination of minimization, avoidance, and mitigation of impacts to fish and wildlife, plants, and wetlands. As environmental task lead, Mr. Rickus has led all species surveys and wetland and waterway documentation, and continues to provide guidance for project design and habitat restoration.

Tualatin Basin Water Supply Project, Clean Water Services, Oregon
DEA is leading the NEPA-EIS efforts for this important regional water supply project, which seeks to meet Washington County's future water needs. Mr. Rickus was the natural resource task lead for the preliminary draft EIS and is now the task lead for upland resources as the project moves forward. He is also providing a key support role for review of aquatic and wetland habitats. Mr. Rickus has played a critical role in the formulation of the project mitigation framework, which seeks to focus mitigation efforts towards priority conservation areas within the Tualatin Basin. As part of this effort he has developed a unique upland habitat functional assessment to guide mitigation planning and conversations with resource agency staff.

US 97- Lava Butte- Wickiup Jct., Unit 1, for the Oregon Department of Transportation, Deschutes County, Oregon
Mr. Rickus is the task leader for this highway improvement project, which falls entirely within USFS lands. Work included extensive surveys for special status wildlife and vegetation, mapping and written analysis of impacts, and development of mitigation for impacts, as well as a detailed review of wildlife crossing structures. Mr.

Rickus worked cooperatively as a team member with ODOT, USFS, and ODFW, to draft, revise, and finalize the NEPA and USFS documentation. He worked extensively with project engineers to develop construction specifications for first of their kind wildlife crossing structures in Oregon.

Barney Reservoir Expansion Wetland and Wildlife Monitoring Project, for Washington and Yamhill Counties, Oregon

A Wildlife Mitigation Plan was developed for the Barney Reservoir Expansion Project to address potential impacts to the local wildlife and its habitat as a result of construction. Twice a year for three years, Mr. Rickus monitored the elk forage areas, artificial nest platforms and perches, and snag and woody habitat created in the inundation and riparian buffer zones as part of the mitigation plan. In the elk forage areas, Mr. Rickus evaluated sample plots for ungulate sign, percent cover and browsing effects on tree, shrub, and herb species and canopy closure. He monitored wildlife use of constructed platforms, snag and woody debris habitat. Mr. Rickus participated in monitoring of wetland creation at Barney Reservoir as well. This included species identification and quantification within plots, establishment of water level monitoring wells, and development of recommendations for compliance with restoration guidelines. All efforts were coordinated through a USFWS representative.

Project Identification Reports, for the Federal Highway Administration, Oregon, Washington, and Alaska

DEA prepared seven project identification reports (PIRs) for proposed Forest Highway projects in Alaska, Oregon, and Washington. Services included field reconnaissance by a team of experts to evaluate environmental, geotechnical, engineering, right-of-way, utilities, structures, and other project elements; as well as preparation of the PIRs. The PIRs include information on existing deficiencies, preliminary project alternatives, estimated costs to complete the project, and potential issues associated with project implementation. The PIRs will be used by the FHWA to determine whether the projects should be added to the Forest Highway program, i.e., receive funding.

BRETT SHIPTON, PE, GE – Principal-in-Charge/Senior Geotechnical Engineer

GEODESIGN INC

EDUCATION

- MS, Geotechnical Engineering, Oregon State University, 1997
- B.Eng, Civil Engineering, University of Pretoria, South Africa, 1994

REGISTRATIONS

- Professional Engineer, OR, WA, ID
- Geotechnical Engineer, OR

AFFILIATIONS

- Earthquake Engineering Research Institute
- American Society of Civil Engineers

Brett Shipton has practiced geotechnical engineering for 15 years in the Pacific Northwest. He specializes in foundation design, seismic hazard assessments, earth retention, and earthquake engineering. Brett has provided geotechnical engineering services for a variety of projects, including utility infrastructure, transportation, residential, and commercial developments. His water and wastewater infrastructure experience includes pipelines, reservoirs, pump stations, and treatment plants. Brett's public agency clients have included the cities of Lake Oswego, Tigard, Portland, Gresham, Salem, Woodburn, and Corvallis, among others. Brett's project work features:

City of Lake Oswego, Stormwater Outfall Repair, Lake Oswego, Oregon. Severe erosion had occurred from stormwater channeled through an outfall. Repair of this outfall was part of a program implemented by the City of Lake Oswego and included evaluation and repair of similar facilities within the City limits. GeoDesign worked with Henderson Land Services, the design-build contractor, to repair the outfall and mitigate future erosion. Brett was principal-in-charge.

Clackamas River Water, Water Distribution System, Clackamas County, Oregon. Brett performed a geotechnical seismic hazard evaluation of six reservoirs and the water treatment facility in the Clackamas River Waters distribution system. Seismic slope stability, liquefaction, and ground shaking were evaluated at the facilities for the 500-year and 2,500-year seismic events.

City of Gresham, Linneman Force Main Alignment, Gresham, Oregon. Brett was principal geotechnical engineer for the evaluation of proposed alignment alternatives for the force main. GeoDesign provided recommendations for design and construction of the force main; excavation and backfill, including the rock excavation, need for dewatering, shoring, temporary slope inclinations, backfill materials, compaction, and excavation stabilization; and recommendations for construction dewatering method. Construction will primarily consist of open cut methods; however, a portion of the alignment is through a wetland and several alternatives are being considered, including horizontal directional drilling.

City of Portland Bureau of Environmental Services, Ankeny Pump Station Upgrade, Portland, Oregon. Brett was the principal geotechnical engineer for the proposed upgrade of this pump station, located on the south side of the Burnside Bridge on the west shore of the Willamette River. Improvements include modernizing the station to meet future wastewater requirements and seismic upgrades. His team provided recommendations for foundations, dewatering during construction and subsurface drainage, and evaluation of seismic design parameters. GeoDesign also evaluated the liquefaction potential of the soils beneath the pump.

City of Corvallis, Northfork Dam Seismic Stability Evaluation, Philomath, Oregon.* Brett completed a stability evaluation of this water supply dam under earthquake shaking levels associated with a 475-year return period. The project included evaluating the 70-foot-tall earth dam under varying pool elevations, including rapid drawdown conditions. The analysis considered stability of the upstream and downstream embankments for slope failure mechanism and estimated displacements for expected ground motion levels. *(*individual experience)*

ERICA HANN, PE – Project Manager/Geotechnical Engineer

GEODESIGN INC

EDUCATION

- BS, Civil Engineering, Gonzaga University, 2003
- MS, Civil Engineering, Portland State University (ongoing coursework)

REGISTRATIONS

- Professional Engineer, OR

CERTIFICATIONS

- HAZMAT Certificate of Training Safety & Transportation of Nuclear Density Gauges, Oregon

Erica Hann is a geotechnical engineer with more than eight years of experience. At GeoDesign, her responsibilities include project management, slope stability analysis, foundation and retaining system design, and settlement analysis and monitoring. Her work includes residential and commercial developments, single- and multi-span bridges, landslide repair, and water infrastructure projects. She has worked for public agency clients in Oregon that include ODOT, Marion County, and the cities of Portland and Lake Oswego. Her project work includes:

Metropolitan Wastewater Management, Commission Tertiary Filtration – Phase I, Eugene, Oregon. Erica was project manager of geotechnical services for this wastewater treatment plant expansion project. The first phase included a filter pump station, five filters, and a backwash pump station. Erica's team provided geotechnical recommendations for use in design and construction. The scope involved providing lateral and uplift pressures for structures constructed beneath a fluctuating groundwater table, recommendations for permeable pavements at the site, and discussions of seismic conditions near the site, as well as recommendations for seismic design factors. The scope also included construction observation services.

Riverbank Stability Evaluation and Sediment Cap Design, Zidell Waterfront Property, Portland, Oregon. GeoDesign has provided geotechnical engineering services in support of design measures and alternatives to construct stable slopes at the site. The site consists of nearly 30 acres with roughly 3,300 lineal feet of riverbank located on the west side of the Willamette River. The shoreline has been modified over the years by placement of man-made fill, which typically ranges from 20 to 30 feet in depth. Our geotechnical evaluation included the analysis of existing and re-graded riverside slopes, alternatives for protection of the riverbank, and recommendations for an in-water sediment cap. Erica conducted slope stability analyses for the design alternatives. GeoDesign also provided environmental support for various project phases.

North Fork Road – Bear Trap Landslide, Marion County, Oregon. For Marion County, GeoDesign provided an evaluation and remediation of a landslide affecting a major county road servicing a rural resort area. The scope involved a subsurface geotechnical investigation to characterize landslide conditions, along with recommendations for emergency repair and lane closures and restrictions as the landslide progressed. Erica's responsibilities included MSE retaining wall design recommendations, global and slope stability analyses, and construction monitoring. The wall was constructed during the summer of 2010, and the road was reopened to all traffic before the start of the rainy season.

Milepost 1.11 and 4.63 Landslides, North Fork Road, Marion County, Oregon. In the spring of 2012, two slope failures occurred along North Fork Road in Marion County. The failures removed the road shoulder, and pose a threat to the road if not repaired. GeoDesign completed a geotechnical subsurface investigation at the two locations and provided multiple options for repair. Mitigation alternatives included construction of a soldier pile wall, construction of a buttress, or installation of soil nails. Erica completed global stability and engineering analysis for each mitigation option. GeoDesign provided Marion County with construction recommendations and preliminary cost estimates for each mitigation alternative.

Young's Bay Intertidal and Shoreline Remediation Project, Astoria, Oregon.* Erica was the staff engineer for a multi-discipline project to mitigate human and aquatic contact with tar bodies exposed in an intertidal area. The project consisted of erosion control and shoreline protection of uplands adjacent to the bay, and a physical cover over the tar bodies in the Bay. Erica performed engineering analyses and design drawings for the project. *(*individual experience)*

STEPHEN PALMER, PhD, CEG – Senior Engineering Geologist

GEODESIGN INC

EDUCATION

- PhD, Engineering Science, University of California, Berkeley, 1982
- MS, Engineering Science, University of California, Berkeley, 1978
- BA, Geology, University of California, Berkeley, 1974

REGISTRATIONS

- Certified Engineering Geologist, OR
- Licensed Engineering Geologist, WA
- Registered Professional Geologist, ID

AFFILIATIONS

- Association of Engineering Geologists
- American Geophysical Union
- Seismological Society of America

Stephen Palmer has 30 years of experience in the earth sciences, including geophysical applications in geotechnical and environmental projects, engineering geology, mine reclamation, and oil and gas exploration. While at the Washington State Geologic Survey, he provided engineering geology consulting to a number of state and local agencies, and managed several federal grant projects. Stephen has both managed and been the technical lead for projects involving surface mine reclamation, aggregate resource evaluation, landslide mitigation, underground utility alignment studies, and stream bank erosion stabilization. His projects include:

Swan Lake Pumped Storage Hydroelectric Project, Klamath County, Oregon. GeoDesign performed geologic investigations, fault hazard investigations, limited surface explorations, geologic evaluations, and geotechnical engineering for the Swan Lake Pumped Storage Hydroelectric Project. The proposed 1,000-megawatt pumped storage consists of an upper reservoir on the western edge and a lower reservoir at the base of Swan Lake. Stephen served as principal-in-charge and senior engineering geologist.

Clean Water Services, SW Locust Street/Ash Creek Sewer Alignment, Portland, Oregon. Stephen was the project lead on an investigation to characterize bedrock properties for construction of a new sewer alignment in southwest Portland. Seismic refraction profiling was performed along 3,600 linear feet of the sewer alignment. Depth-to-bedrock and P-wave velocities, used in estimating rock rippability for trenching, were determined along each profile. These results were compared to bedrock depths determined from test pits, GeoProbe explorations, and geotechnical borings drilled in support of the alignment investigation. Laboratory testing and logging of rock core obtained in the borings was used to provide information necessary for directional drilling proposed for portions of the alignment.

Clark Regional Emergency Services Agency, Liquefaction Susceptibility and Seismic Site Class Maps, Clark County, Washington.* While with Washington State Department of Natural Resources, Stephen was responsible for producing county-wide liquefaction hazard and seismic site class maps for Clark County's emergency response planning and geologic hazard ordinances. His work included a detailed evaluation of liquefaction and earthquake ground motion hazards for the entire county. These maps have been incorporated into the County's Critical Areas ordinances. *(*individual experience)*

Mercer Island Sewer Lake Line and Pump Station No. 4 Replacement, Mercer Island, Washington. In 2009, GeoDesign provided geotechnical engineering services in support of a new pump station next to Interstate 90, at the edge of Lake Washington. The scope involved a subsurface investigation, as well as dewatering and construction recommendations for the sheet pile construction of a 23- by 23-foot, 50-foot-deep hole (cofferdam) for the new subsurface pump station. Stephen was the technical lead for developing the subsurface geological and geo-hydrological model used in assessing pumping requirements for the dewatering of the cofferdam.

City of Portland Bureau of Environmental Services (BES), Burlingame Sewer Trunk Line, Portland, Oregon. As project manager, Stephen led GeoDesign's engineering geology and geotechnical engineering support to the Burlingame Sewer Trunk design and construction. This project involved replacing an existing sewer trunk line that had been aligned along Burlingame Creek. The new 36-inch-diameter pipe is offset from the old sewer line, which is being abandoned. Stephen's team provided consultation and recommendations to BES regarding abandonment of the old sewer line that factored in stream bank stability and the desirability of pipeline removal. Stephen's team also evaluated grading and reshaping of stream banks and adjacent slopes in areas where the old sewer line was removed, and provided design recommendations for mitigating a landslide on an embankment of I-5, which was related to installing the adjacent sewer trunk line.

CHARLIE CLOUGH, CEG – Project Manager/Engineering Geologist

GEODESIGN INC

EDUCATION

- MS, Geology, Portland State University, 2005
- BS, Geology, Portland State University, 1992

REGISTRATIONS

- Certified Engineering Geologist, OR
- Registered Geologist, ID
- Licensed Engineering Geologist, WA

AFFILIATIONS

- Association of Engineering Geologists

Charlie Clough has more than 15 years of geological, geotechnical, technical engineering experience. He regularly performs field reconnaissance, geologic field mapping, subsurface explorations, and geophysical investigations (seismic refraction, ground penetrating radar, electrical resistivity) in support of geotechnical investigations, and prepares regional and site-specific geologic and seismic hazard reports. Charlie also has project experience working on earth dams and landslides, as well as experience on large municipal projects and coastal geotechnical engineering projects. He has performed extensive research on Oregon coastal geology issues that include beach sand sediment supply, evidence for Cascadia Subduction Zone Earthquakes, and characterization of paleodune deposits on the Oregon Coast. His projects include:

Clean Water Services, SW Locust Street Sewer Alignment, Tigard, Oregon. Charlie was the field geologist for a seismic refraction survey along this sewer alignment project. An over-lapping series of seismic refraction profiles were acquired along the proposed alignment to provide an estimate to the depth and rippability of shallow basalt bedrock. Charlie logged a series of geotechnical borings to verify the results of our seismic profiling, and to obtain in-situ rock characteristics, such as fracture density, and core samples for laboratory testing. Samples of the rock core were tested to determine the unconfined uniaxial compressive strength and CERCHAR abrasiveness index. The results of our core logging and laboratory testing were used to develop construction bid specifications for directional drilling.

Earth Fill Dam, Treatment Lagoon and Water Infrastructure, Cow Creek Band of Umpqua Tribe of Indians – Canyonville, Oregon. Located in a narrow drainage valley, this project includes an 80-foot-high earth fill dam, various borrow areas, a wastewater treatment lagoon, associated piping, a two-million-gallon reservoir, water treatment plant, various rock sources, and an RV park. GeoDesign provided geotechnical investigations, seismic evaluations, stability analysis, geophysical profiling, hydrogeologic analysis, and construction observation services. In addition, GeoDesign provided extensive geotechnical design support for 3,000 lineal feet of water intake and outlet piping, pumping systems, the reservoir, and other infrastructure. Charlie was the senior field geologist.

Swan Lake Pumped Storage Hydroelectric Project, Klamath County, Oregon. Charlie served as senior field geologist in charge of geologic reconnaissance and mapping the site geology. GeoDesign performed geologic investigations, fault hazard investigations, and limited subsurface explorations for the geologic characterization and conceptual geotechnical engineering. The proposed 1,000-megawatt pumped storage consists of an upper reservoir on the western edge and a lower reservoir at the base of Swan Lake. The upper reservoir will be contained by two rock fill embankments. The lower reservoir will be created by an up to approximately 100-foot-high rock fill embankment. There will be a 1,300-foot vertical shaft and roughly 2,000-foot headrace tunnel connecting the upper reservoir to a powerhouse cavern and a 4,600-foot tailrace tunnel will connect the proposed powerhouse to the lower reservoir.

Snow Reservoir Repairs, Washington County, Oregon. GeoDesign has provided a geotechnical engineering evaluation and final design of a new outfall conduit for this small reservoir constructed in the mid-1980s. (The reservoir suddenly drained overnight in November 2011 through a sink hole next to the intake riser.) GeoDesign conducted field reconnaissance and evaluated several mitigation options before recommending the construction of a new outfall pipe. GeoDesign is also developing recommendations for the abandonment, repair, or retrofit of the existing outfall conduit. Charlie has served as the project manager and lead field geologist.

North Fork Road – Bear Trap Landslide, Marion County, Oregon. Charlie served as project geologist for our subsurface geotechnical investigation to characterize a landslide affecting a major County road servicing a rural resort area. The subsurface investigation defined the geological conditions controlling the landslide, and provided the necessary information for determining the most appropriate approach to mitigating the slope failure.

EDUCATION

- MS, Civil Engineering, University of Texas, Austin, 2001
- BS, Civil Engineering, Utah State University, 1999

REGISTRATIONS

- Professional Engineer, OR, WA, UT, and ID

AFFILIATIONS

- American Society of Civil Engineers (ASCE)
- Past President, Geotechnical Group of the Oregon ASCE

Elliott Mecham has over ten years of specialized experience in geotechnical engineering, having worked on a range of water infrastructure projects over the course of his career. He has performed specialized geotechnical design and served as an owner's representative for numerous water and wastewater facilities in the Pacific Northwest. Elliott earned a bachelor's degree in civil engineering from Utah State University and a Master's Degree in Geotechnical Engineering from the University of Texas at Austin, where his research involved instrumentation of model foundation systems. Elliott's project work includes:

City of Portland Bureau of Environmental Services, Ankeny Pump Station Upgrade, Portland, Oregon. Elliott was project manager of geotechnical engineering services in support of this proposed pump station upgrade. The City and its design team were studying the pump station with the goal of modernizing the station to meet future wastewater requirements. In addition to overseeing subsurface explorations and providing seismic design recommendations, Elliott helped identify a document published in 1933, which provided details on the construction of the pump house and indicated that the pump substructure was constructed on very dense Troutdale formation gravels. A detailed review of the available historic information used in conjunction with contemporary information allowed the project team to more accurately assess the seismic risk at the pump station.

City of Wilsonville Sewage Treatment Plant, Wilsonville, Oregon. Elliott was project manager of geotechnical services in support of improvements at this wastewater treatment plant. The scope involved exploring the site's subsurface conditions to provide geotechnical information for use in the design-build-operate effort. Work also included pump testing to evaluate the aquifer characteristics of the site. Elliott represented the owner during construction.

Pony Creek Treatment Plant, Coos Bay, Oregon. Elliott was project manager of GeoDesign's dynamic pile testing services for the construction of the new chemical building at the Pony Creek Water Treatment Plant in Coos Bay. The building is to be supported on a combination of 18- and 20-inch-diameter, ½-inch-thick wall, open-ended pipe piles. Elliott oversaw the dynamic load testing of the piles to determine the pile resistance and confirm that the piles could support the structural load requirements.

Proposed Sewer Pump Station, Milwaukie, Oregon. Elliott was project manager of geotechnical technical support for the contractor at the pump station project on Johnson Road. He observed the temporary slopes that were being excavated at the site, as well as the excavated soils that were stockpiled at the site for construction of the proposed sewer pump station. The soil stockpiles were derived from the material obtained during the pump station excavation and consisted primarily of gravel and cobbles, with varying amounts of silt and sand. Elliott provided recommendations to the contractor for soil mixing and amending at the site to allow for use of the on-site soils as backfill during periods of extended wet weather.

City of Gresham, Linneman Pump Station Expansion Improvements/Force Main Alignment, Gresham, Oregon. Elliott was project manager of geotechnical serves to assist the design team in selecting an alignment for the force main. The City was evaluating proposed alignment alternatives for the force main between the pump station at 3363 West Powell Boulevard to a location 600 feet south of Division Street along an existing railroad embankment. Plans called for construction to be accomplished by trenching, with horizontal directional drilling being considered for portions of the alignment in environmentally-sensitive areas. The scope also included aquifer testing to help define the dewatering requirements for the project's construction.

Brad Moore, PE
Senior Water Resources Engineer

Project Role: Project Manager

Education
BS, Civil Engineering
MS, Water Resources Engineer

Registrations
Professional Civil Engineer, Oregon

Years with Firm
6

Professional Summary
Brad is a senior water resources engineer with project management experience on numerous multi-disciplined teams for storm and surface water projects including watershed planning, urban stormwater master planning, flood control planning, drainage design, hydrology and hydraulic modeling/analysis, and combined sewer overflow planning and design. His experience in managing multi-disciplined design teams (including the management of value engineering and making design decisions) demonstrates his superior skills at managing the scope and quality of work to ensure the final design will be delivered on time and budget (risk management for the Program Sponsors and rate payers).

Relevant Project Experience
Balch Consolidation Conduit Project, Bureau of Environmental Services (BES), City of Portland, Portland, OR

Brad served as Technical Director for a 6,900-foot pipeline, the final piece in the City's 20-year CSO program. His responsibilities included integrating the pipeline design elements into the overall project; managing the delivery of the work products; managing the project schedule and budget; supporting the predesign alternative alignment evaluation; and overseeing the final design. BES had a regulatory deadline of December 2011 to complete the program so the schedule on this pipeline was critical. In order meet this schedule, Brad assisted the City by addressing the microtunneling aspect of the project. Scheduling of the tunnel boring machine requires a one-year lead time, so Brad directed the design team to do the 30% and 60% design concurrent with the client qualifying and selecting a tunneling contractor. The 60% design was complete at the time the contractor was selected so that the contractor was able to provide input to the final design. Overall this saved the client 9-12 months on the schedule and the regulatory deadline was met. Brad will provide the same level of assurance in meeting the 2016 schedule to provide water to the City of Tigard.

Water Treatment Plant Design, City of Gearhart, Gearhart, OR

Brad was project manager for the evaluation and design of a new water system for Gearhart, Oregon. The project included 7,000 feet of 16-inch diameter water pipeline and a one-million gallon reservoir, as well as a new membrane water treatment plant and development of new wells. Brad's responsibilities as project manager included coordinating the work with the City of Gearhart, Oregon Water Resources Department, Oregon Drinking Water Program and other state agencies. He managed the multi-disciplined team to incorporate hydrogeological; geotechnical, electrical, and structural engineering; mechanical process engineering; and architectural services into the evaluation and design.

Powell Butte Drainage, City of Portland, Bureau of Water Works, Portland, OR

Brad was the Project Manager responsible for working with the Portland Water Bureau to establish drainage improvements that are needed long-term to address construction and post-construction stormwater impacts of new water facilities to be constructed by the Water Bureau. The project included coordination of work activities with the City's Bureau of Environmental Services and Parks Bureau and public interaction with park users and local neighborhood groups. The study initially established guiding principles and evaluation criteria as a foundation for objectively evaluating any stormwater improvement alternatives. The work also included review of existing drainage problems, and proposed stormwater solutions consistent with the guiding principles and evaluation criteria in a public park setting within the Johnson Creek Watershed.

West Slope Sewer, City of Beaverton, Beaverton, OR

As Project Manager, Brad responsible for the evaluation of sanitary sewer retrofitting options for neighborhood improvements along with final design and bid documents for open excavation and pipe bursting for pipeline improvements. Work consisted of review of tv reports, preparation of optional layouts and costs, and final design survey, plans and specifications. During the preliminary design phase, a technical memorandum was provided that presented several possible construction methods (e.g., open cut and trenchless) and preliminary alignments (plan view only) of the proposed sanitary sewer improvements. This technical memorandum served as the basis of design for the construction documents that followed, which included 900 feet of open cut sanitary sewer improvements and 400 feet of cured-in-place pipe. The selected option included a combination of open excavation within street sections and cured-in-place pipe for backyards and other areas with difficult access.

Tanner Creek Diversion Pipeline, Bureau of Environmental Services, City of Portland, Portland, OR

Brad previously served as Project Manager for the design of 20,000 feet of 48- to 84-inch diameter water pipeline for the City of Portland BES.

Fred Neal, PE

Senior Project Engineer

Project Role: Design Manager

Education

BS, Civil Engineering
MS, Environmental Engineering

Registrations

Professional Civil Engineer, Oregon (pending review)

Years with Firm

23

Professional Summary

Fred has more than 35 years of experience in the planning, design, and construction of infrastructure projects involving water supply, wastewater collection and treatment, storm drainage and flood control, water reclamation, and environmental quality. He has prepared preliminary plans, detailed designs, contract documents, and cost estimates. In addition, he has provided construction engineering services for all types of infrastructure systems including water supply pipelines, water storage facilities, and pumping stations airports, universities, wastewater collection systems and water reclamation pipelines and plants.

Relevant Project Experience

Freeport Pipeline Facilities, Freeport Regional Water Authority, Sacramento, CA

Project Manager for project that involved design of the $140 million Freeport Pipeline Facilities Project as part of the $500 million Freeport Regional Water Project for the Freeport Regional Water Authority (FRWA). The pipeline project consists of 16.9 miles of welded steel pipeline in four bid packages: Segments 1 and 2 total 11.8 miles of 84 inch-diameter pipeline including 8 tunnels; Segment 3 totals 3.9 miles of 72-inch-diameter pipeline with one tunnel; and Segment 4 totals 1.2 miles and 66 inch-diameter pipeline. The project required careful attention to many significant non-design related issues including environmental, right of way acquisition, and permitting. Issues addressed included endangered species habitat, wetlands, creek and railroad crossings, heavy commuter traffic, residential concerns about working hours, noise and tree removal, and permit negotiations with the City of Sacramento, Sacramento County and the US Bureau of Reclamation. Fred worked closely with FRWA's environmental and right of way acquisition consultants and coordinated the pipeline design with the design for the river intake and pump station by other consultants. Fred worked closely with team members Tracie Mueller and James Bowland to ensure a high-quality design that was delivered on time and saved the client more than $1,000,000.

Design and Construction Support of the Southern Loop Pipeline (SLP), Seismic Improvement Program (SIP), East Bay Municipal Utility District, Oakland, CA

Project Manager for this 11.5 mile water transmission main consisting of 60-, 42-, 36-, and 30 inch-diameter welded steel pipe. The $36 million SLP is designed to provide emergency water service to EBMUD customers in Alameda and Contra Costa counties in the event of damage to primary water transmission facilities due to an earthquake. The pipeline crosses through the East Bay Hills in a 10 foot-diameter tunnel, 1,800 feet long.

The project required careful attention to many significant environmental concerns, including endangered species habitats, wetlands, crossing of the Calaveras Fault, rock outcroppings, landslide areas, creek crossings, heavy commuter traffic, limited construction access and working hours, residential concerns about water service, traffic and noise and lengthy permit negotiations with Alameda County and the City of San Ramon.

72-Inch Raw Water Bypass Pipeline Design and Construction Management Services, San Juan Water District, Granite Bay, CA

Project Manager for this project that involved the design and construction management of a new 72 inch diameter welded steel raw water bypass line from an existing pump station at US Bureau of Reclamation's Folsom Dam to the Hinkle Wye where it was connected to the existing raw water lines feeding the San Juan Water District's water treatment plant. It also involved construction of a new 60-inch-diameter by pass line. A 140-foot-tall welded steel surge tower was also designed and installed on the 72 inch line as it was determined to be the most cost effective solution for transients control on the pipeline. The project required careful attention too many significant non-design related issues including environmental and permitting. Issues addressed included endangered species habitat, creek crossings, tree removal, and permit negotiations with the US Bureau of Reclamation.

Design and Construction of Recycled Pipelines, City of Santa Clara, Santa Clara, CA

Project Manager for project that involved planning, design and construction support for approximately 22,000 linear feet of new 12-inch-diameter recycled water pipelines serving commercial/industrial users in Santa Clara. It also included trenchless crossings of the US-101 and the Central Expressway. This project is a continuation of Kennedy/Jenks long history (over 15 years) of designing recycled water pipelines for the City. As Project Manager, Fred's responsibilities include contract negotiation, preparation of scope, budgets and schedules, subconsultant selection and management, technical direction and review, cost control and invoicing.

Bill Yates, PE
Senior Project Engineer

Project Role: Technical Advisor

Education
BS, Civil Engineering
MS, Water Resources Planning and Management

Registrations
Professional Civil Engineer, California, Oregon (pending review)

Years with Firm
22

Professional Summary
Bill has specialized in pipeline design for his 25-year career and his experience in planning, design and construction management of large diameter pipeline projects (including alignments that cross bridges, rivers, railroads and busy intersections and projects using trenchless technology). As a project manager and project engineer, he has been responsible for many projects including water treatment, pipeline and pump station design, water storage facilities construction inspection, hydrological and geological studies, water well systems, hydrological analysis testing, storm sewer design, residential land development, airport site selection, and drainage basin, irrigation, and river modeling.

Relevant Project Experience
Honby Pipeline - Phase 1A and 1B, Castaic Lake Water Agency, Santa Clarita, CA

Responsible for coordination and design services of 2,500 feet of 60-inch steel pipeline. The project included connection to the Agency's 84-inch and 33-inch pipelines, a 72-inch steel casing beneath a future pedestrian bridge, pipeline slopes exceeding 50 percent and significant coordination with the property developer.

Honby Pipeline Phase 2, Castaic Lake Water Agency, Santa Clarita, CA

Responsible for coordination and design services of 6,500 feet of 60-inch steel pipeline. The project included a 1,400 foot open cut crossing of the Santa Clara River with permanent sheet piles and concrete encasement, a 1,100 foot section constructed by microtunnel techniques 50 feet below grade, a 100 foot 76-inch bore and jack, connection to the Agency's 60-inch pipelines on each end, night work within City streets, and significant coordination with the Los Angeles Department of Water and Power and the property developer.

Castaic-Design-Magic Mt. Pipeline-2, Castaic Lake Water Agency, Santa Clarita, CA

Responsible for project management, coordination and design of 3,500 feet of 42 inch steel pipeline. The project included coordination with the County of Los Angeles' road widening project, coordination with Newhall Land & Farms road widening and I 5 bridge widening projects, separate purchase of pipe and construction contract documents, and development of a three phase construction program.

CMS-Lateral Extension & Storage, Castaic Lake Water Agency, Santa Clarita, CA

Responsible for project management, coordination, design, and construction management services of 4,000 feet of 42 inch steel pipeline. The project included tying into an existing 48 inch pipeline, 380 feet of concrete encasement, crossing of several large diameter high pressure gas lines, and coordination with several property owners. This was a fast track project with separate contract documents for pipe fabrication and pipeline installation which was completed within 4 weeks.

Lynn Road Lateral Design Services, Calleguas Municipal Water District, Thousand Oaks, CA

Based on master planning efforts it was determined that the District's water system required additional capacities, reduction in flow, and reduction in pressure losses. A 30 inch water system lateral was proposed and designed within the right of way of a major city street. The project included the design of 16,500 feet of 30 inch pipe, three valve vaults, and various appurtenances. In addition, traffic constraints and regulations were incorporated into the design.

Castaic Lake - Lateral Extension, Castaic Lake Water Agency, Santa Clarita, CA

Responsible for project management, coordination and design of 4,400 feet of 24 inch steel pipeline. The project included boring and jacking (340 feet) beneath the I 5 freeway, a 900 foot open cut crossing the Castaic Creek, construction of 2,500 feet of pipeline within the County of Los Angeles' Peter Pitchess Detention Center, and connection to the Agency's 54 inch concrete cylinder pipe. The creek crossing included a dewatering system, 850 feet of sheet piles, and concrete encasement.

Castaic Lake - Newhall Parallel Phase 2, Castaic Lake Water Agency, Santa Clarita, CA

Responsible for project management, coordination, design, and construction management services of 6,000 feet of 54 inch and 48 inch steel pipeline. The project included major coordination with the property developer, connection to an existing 84 inch pipeline and a 700 foot open cut crossing of the Santa Clara River. The crossing included diversion of the 6 MGD river flow, dewatering system, 600 feet of sheet piles, and concrete encasement.

Bill Latone
Senior Engineer

Project Role: Technical Advisor

Education

MS, Management
BS, Civil Engineering

Registration

Civil Engineer, California
General Contracting License, Oregon

Professional Summary

Bill has more than 35 years of civil engineering experience with an even balance between construction management and design with an emphasis in municipal water, industrial waste and wastewater facilities. He has considerable experience in cost estimating and performing constructability review of projects during design. He is a corporate resource on construction-related issues as well as protective coatings and pipeline design. He is a licensed Class A General Contractor with Hazardous Certification in the State of California.

Years with Firm

31

Relevant Project Experience

East Bay Municipal Utility District, Moraga Road Pipeline, Moraga, CA

As the project engineer, prepared the cost estimates for the EBMUD project that installs approximately three miles of large-diameter pipeline from the Lafayette Water Treatment Plant to the intersection of Moraga Road and Draeger Drive in Moraga. Once the pipeline is completed, it will improve water delivery reliability and maintain water quality for portions of Lafayette, Moraga, and Orinda.

National Park Service, Yosemite Valley Integrated Utility Master Plan, Yosemite National Park, CA

Performed contract change orders, cost estimating and negotiations for all field work.

East Bay Municipal Utility District, Mokelumne Aqueduct No. 3 Elevated Pipeline Improvements, San Joaquin County, CA

As Project manager performed contract change orders, cost estimating and negotiations for all field work. Performed constructability review for the utility master plan.

Incline Village General Improvement District, Cost Estimating for the Burnt Cedar Disinfection Facility, Incline Village, NV.

Prepared construction cost estimate for the new disinfection facility, which employs ozonation

Westborough Water District, Cost Estimating, CA

Developed replacement costs for various water system improvements for revenue program input.

Kern County Water Agency and City of Shafter, Cost Estimating, CA

Supervised development of cost estimates for various cost studies on existing and planned facilities.

Calleguas Municipal Water District, Cost Estimating for the Calleguas Water Treatment Plant, Thousand Oaks, CA

Prepared independent cost estimate for the $24 million water treatment plant construction.

Tracie Mueller
Project Engineer

Project Role: Pipeline Design Team

Education

BS, Environmental Engineering
MS, Water Resources Engineering

Registrations

Professional Civil Engineer, California

Years with Firm

10

Professional Summary

Tracie provides planning, design, and construction management services for raw and treated water pipelines, sewer mains and laterals, as well as other infrastructure projects. Her experience includes condition evaluation of existing sewer and water systems, and preparation of repair and facility improvement recommendations. She is also proficient in water system hydraulic modeling using WaterCAD and H2ONet software. Her experience includes developing design drawings, specifications, cost estimates, schedules, technical analysis reports and memorandums, water models, grant and load funding applications, and master plans. In addition, she provides permit, easement, and utility coordination assistance services, and construction management administration services including management of inspectors. She has extensive experience coordinating with clients, subconsultants, regulators, permit agencies, and the general public.

Tracy has recent applicable experience on the design of large diameter pipeline projects such as the Freeport Regional Water Authority's pipeline project that required significant of coordination with the clients; program management team; subconsultants including our design partners, Brown and Caldwell; permit agencies; utility companies; developers; and property owners.

Relevant Project Experience

Freeport Pipeline Facilities, Freeport Regional Water Authority, Sacramento, CA

As Project Engineer and Segment Leader, led the design of the Segment 1 design consisting of 5.1 miles of 84-inch diameter raw water pipeline and including five underground tunnels, two main drain structures, and over 25 easements (bid price of $56 million). During design, met and corresponded with the owners and many different agencies, developers, engineers, and contractors to coordinate future and existing infrastructure within the Segment 1 area. Also led the utility coordination and permitting effort for the entire four-phase pipeline project consisting of 17 miles of 84-inch to 66-inch diameter raw water pipeline currently being constructed in Sacramento County from the Sacramento River (near Freeport, CA) to the Folsom South Canal and the new Sacramento County Water Agency Water Treatment Plant. Permitting efforts included preparation of applications, coordinating meetings, and responding to comments for 23 permits and/or agreements from the City of Sacramento, County of Sacramento (including County Sanitation District No. 1 and Sacramento Regional County Sanitation District), CalTrans, Union Pacific Railroad, Central California Traction Company, The Reclamation Board, and the Department of Industrial Relations.

Intake Spring Water System Replacement Project, McCloud Community Services District, McCloud, CA

Provided funding acquisition, design, bid, and construction administration support services for both phases of this project. During the Phase 1 Project, assisted in the development of a pre-design report that evaluated the District's existing water supply systems, design of 19,000 LF of new 14-inch and 16-inch ductile iron transmission main to replace an old and deteriorated 10-inch redwood pipeline, and design of a 1.2-mg ground-level steel water storage tank, site pipeline, and tank appurtenances. In addition, helped oversee the subconsultant's design for structural improvement of the Intake Springhouse which included extending the foundation, covering the spring, and drainage around the springhouse.

Sacramento County Airport System (SCAS), Terminal Modernization Program, Corgan Associates, Inc., Sacramento, CA

As Project Engineer, designed over 56,000 lineal feet of new utilities mains and laterals to service new the new landside Terminal B building and garage, and the new airside Concourse B and electrical vault. The utility improvements included potable water, irrigation water, sanitary sewer, storm drain, gas, electrical, and telecommunications. During the design, coordinated with lead architects, 10 subconsultants, Airport Facilities Management, Airport Operations and Planning, Air Rescue Fire Fighters, Sacramento County Water Agency, SMUD and PG&E. Updated, calibrated and analyzed the airport's potable water system model using WaterCAD® modeling software.

Water System Transmission Pipeline, Amador Water Agency, Amador, CA

For this 30-inch diameter raw water transmission pipeline design, Tracie prepared design drawings and specifications for the new 9-mile transmission main. This design was especially challenging due to the steep slopes, rocky soil and mountainous terrain. In addition, led the permitting task and contacted permit agencies, submitted design documents and required application to the agencies for review, and incorporated agency comments and mitigation measures into the construction documents.

Aaron Eder, PE

Senior Project Engineer

Project Role: Pipeline Design Team

Education

BS, Civil Engineering, Water Resources
MS, Civil Engineering, Water Resources

Registrations

Professional Civil Engineer, Oregon

Years with Firm

9

Professional Summary

Aaron works almost exclusively on municipal water, wastewater, and stormwater projects. Aaron's specialty is in the efficient performance of civil site design and pipeline design projects, including water lines, sewer mains and storm drains. Throughout his career, he has designed civil site improvements and over 100,000 feet of pipelines for various municipalities in Oregon and Southwest Washington, including the Cities of Beaverton, Hillsboro, Portland, Woodburn, Tillamook, Vancouver, and Tacoma. Aaron is also the author of several project articles that have been featured in assorted publications, including AWWA's *MainStream, OpFlow, and Water Matters, APWA Reporter, Underground Construction, Site Solutions, The Military Engineer,* and *Government Engineering.* His local pipeline expertise will be invaluable to the team.

Relevant Project Experience

Balch Consolidation Conduit Project, Bureau of Environmental Services, City of Portland, Portland, OR

Project Engineer. The Project is needed to comply with the mandated Amended Stipulated and Final Order (ASFO) administered by the Oregon Department of Environmental Quality. The ASFO requires that the City construct facilities to control combined sewer overflows (CSOs) to the Willamette River to a level commensurate with four winter overflows annually and one summer overflow every three years. The Project includes approximately 5,000 feet of 84-inch diameter sewer main, which will convey up to 380 cubic feet per second (cfs) of combined sewage from the Balch Basin to the existing Nicolai drop shaft on the Westside Combined Sewage Overflow tunnel. As the Project Engineer, Mr. Eder's responsibilities include design of the 84-inch pipeline and coordination with existing utility purveyors in the project vicinity.

Terminal Reservoir and Pump Station Design, City of The Dalles, The Dalles, OR

Project Manager. Project elements include 2.7 mg welded steel reservoir, a 1,500 gpm CMU pump station, 10,000 feet of 8-inch to 16-inch DI transmission and distribution pipe, and 7 PRV stations. Responsibilities include management of the multi-office, multi-discipline design team and subconsultants, ensuring that all internal and client project deliverables were completed correctly, on time, and within budget while communicating with the City's Project Manager at an appropriate level. This fast-track project was a recipient of federal stimulus funding, and the project was surveyed and designed in 5 months in order to meet ARRA funding requirements.

Portland Mall Segment, South Corridor Project, TriMet, Portland, OR

Project Manager / Project Engineer. This project included water main relocations for TriMet's Portland Mall Segment of the South Corridor Project. Duties include management of the design team, design and drafting of plans and profiles for approximately 6,000 feet of 12-inch ductile iron water mains parallel to the rail line, various cross-street main replacements, and relocation and/or replacement of 25 fire hydrants and 80 water services, and preparation of construction quantities.

Lombard Avenue Water Line Project, City of Beaverton, Beaverton, OR

Project Manager/Project Engineer. Project fee negotiation, design and drafting of plans and profiles for the new water main and preparation of the opinion of probable construction costs and Special Provisions to Oregon Department of Transportation (ODOT) specifications for the project. The project included 60 feet of 18-inch ductile iron pipe, 700 feet of 16-inch ductile iron pipe, 60 feet of 12-inch ductile iron pipe, 165 feet of 8-inch ductile iron pipe, 35 feet of 8-inch ductile iron pipe inside 24-inch steel casing, and 100 feet of 6-inch ductile iron pipe.

Ellsworth Water Treatment Plant Improvements, City of Vancouver, Vancouver, WA

Project Manager/Project Engineer. This project includes upgrading the existing booster pump from 8,500 gpm to 16,000 gpm, installation of a 24-inch transmission pipeline from the new booster pump through forested area north of the facility, and stormwater treatment and detention improvements. The least intrusive pipe installation method possible is desired to reduce disturbance to the existing vegetation and forest site, so an evaluation of an open-cut trench versus trenchless installation is being provided. Mr. Eder is responsible for the design of the transmission pipeline, stormwater improvements, and civil site design.

Kim Staheli, PE, PhD

President and Principal

Project Role: Pipeline Design Team

Education

PhD, Geotechnical Engineering
MS, Civil Engineering
BS, Mechanical Engineering

Registrations

Professional Civil Engineer, Oregon

Years with Firm

3

Professional Summary

Kim is a trenchless technology specialist with an 18-year background including both consulting engineering and engineering for construction contractors. She is the President and Principal Engineer of Staheli Trenchless Consultants and is widely recognized as one of the foremost experts in her field. She works to reduce trenchless construction risk on projects through direct experience with a myriad of trenchless technologies including microtunneling, horizontal directional drilling, auger boring, pipe ramming and guided boring and has performed feasibility studies, designs, development of plans and specifications for construction, constructability reviews, prequalification packages, bid reviews and bid services. She has also performed numerous on-site specialty construction inspections. She has extensive experience providing expert testimony and review as well as forensic reviews of trenchless construction projects for Owners, Engineers, Contractors, and Insurance companies. Prior to founding her consulting practice, Kim worked for two trenchless contractors in the United States as a Project Engineer. Kim led the project definition efforts to determine the best trenchless methods for crossing the Willamette River and Lakewood Bay. Kim will carry this experience forward to complete the design in a expedient, cost-effective manner.

STAHELI trenchless consultants

Relevant Project Experience

Lake Oswego Tigard Water Supply Expansion Project – Project Definition Phase

The project definition phase included the preliminary feasibility analysis of two 2,800-foot trenchless crossings underneath the Willamette River and Lakewood Bay. As a specialized portion of the Project Management Team established for the project, Staheli Trenchless Consultants has led all HDD feasibility and constructability evaluation efforts, including the analysis of potential alignments and bore geometry, preliminary risk evaluation and cost estimate preparation, preliminary construction schedule and public impact determination, pipe sizing and material selection, geotechnical investigation and laboratory test recommendations, construction layout area and easement selection, and general evaluation of all trenchless pipeline constructability.

Alameda Siphon Project, City of Alameda/EBMUD/Port of Oakland, CA

Kim performed a feasibility study evaluating installation methods for the construction of a siphon beneath the Alameda Channel. The evaluation included two construction methods (horizontal directional drilling and microtunneling), two pipeline materials (HDPE and RCP), and three pipe diameter groups (less than 36 inches, 36 inches, and greater than 36 inches) for the proposed inverted siphon. Based on the results of the study, Kim completed design of a 36-inch OD HDPE siphon installed by horizontal directional drilling 30 feet below the channel. The HDD design accounted for such challenges as a single pullback of over 1,200 feet, tight bend radii, 60+ feet of full column mud load, and buried piers within the bore alignment. Kim provided on-site specialty construction management services during the HDD installation. Staheli Trenchless was a subconsultant to Kennedy/Jenks.

Big Gulch Segment 3, Mukilteo Water and Wastewater District

Claim Analyst for review of the construction of two challenging directional drills and the corresponding contractor claim. The large drill was 2,500 feet of 20-inch ID fusible PVC installed with a 170-foot elevation difference between exit and entry in a highly sensitive environmental area. The second drill was a 1,500 foot, 12-inch HDPE installed with a 290-foot elevation difference between exit and entry. Drilling was conducted in highly variable soils with colluvial landslide deposits over glacial containing cobbles and boulders over glacial lacustrine deposits. Kim provided an expert opinion on the cause of the failure as well as assigned quantum to the claim.

Dakota Creek Water Transmission Line

Principal Engineer for evaluating the feasibility of using HDD to install a 22-inch inner diameter water supply pipeline for the Dakota Creek Crossing Water Main Replacement project in Whatcom County, Washington. HDD was selected for the Dakota Creek crossing because of the steep banks around the creek and to provide adequate cover over the pipeline in the tidally influenced zone. The feasibility study included geotechnical site evaluation, bore geometry appraisal, work site evaluation, hydrofracture analysis and conductor casing requirements.

Anacortes Transmission Water Main Replacement

Principal Engineer for performing a feasibility study, alignment design, pullback and stress calculations, geotechnical baseline report preparation, specifications for construction, submittals review and specialized construction management. The Anacortes Transmission Water Main consisted of a 36-inch horizontal directional drill beneath the Swinomish Channel to provide the City of Anacortes with a new water line. The 1,200-foot crossing included drilling beneath piers on both sides of the channel in an environmentally sensitive area. Tight restrictions were imposed on inadvertent fluid returns in the channel due to the brackish water environment and potential habitat damage. A geotechnical baseline report was prepared to provide a basis for contractor bids and evaluation of changed conditions claims. Kim participated in pre-qualification of HDD contractors prior to the bidding process and performed submittal reviews following bid closure.

Laura Wetter
Project Geologist

Project Role: Pipeline Design Team

Education
MS, Geology
BS, Geology

Registration
Geologist-in-Training, Washington

Professional Summary
Laura is involved with feasibility studies, geotechnical investigations, risk assessment and project design for a variety of trenchless methods that include microtunneling, horizontal directional drilling, pipe ramming and auger boring. She has provided bid service assistance, plans and specifications, constructability reviews and construction inspection for a variety of projects and environments. She has extensive experience with geotechnical writing, cost estimates, technical calculations and plan and profile development. Laura is the current chair of the Pacific Northwest Chapter of the North American Society for Trenchless Technology (NASTT).

STAHELI trenchless consultants

Years with Firm
3

Relevant Project Experience

Locust Street Sanitary Sewer Trunk Upgrade, Tigard, OR

Project Geologist for the design of 1,150 feet of 20-inch HDPE pipeline via guided boring with an air hammer and reaming enlargement. This project included challenging site layouts and excavation through a variety of soils ranging from basaltic bedrock to stiff clays and silts. Laura reviewed both the surface and subsurface conditions for construction and method feasibility, and assisted in the development of a specification for the innovative HDD hybrid method.

Tulalip Water Pipeline, Everett, WA

Project Geologist for the design of approximately 8,000 feet of 36-inch diameter steel pipeline installation via horizontal directional drilling. Crossings underneath five separate waterways were evaluated by STC for horizontal directional drilling. Laura reviewed the geotechnical explorations, and developed layouts and bore geometry to assess risks and construction feasibility. She performed cost estimates in conjunction with construction schedules, performed technical review of all trenchless plans and specifications, and was jointly responsible for the production of a Basis of Design Report. Laura also provided technical memoranda for permitting and evaluation of geotechnical risks. This project is currently in final design.

Hueneme Outfall Replacement Project, Port Hueneme, CA

Project Geologist for the design review of over 2,300 feet of 36-inch diameter HDPE pipeline installation via horizontal directional drilling. Highlights of the project include a 60-foot elevation difference between entry and exit points, a partially confined aquifer located within 20 vertical feet of the proposed drill alignment, and challenging exit area limitations involving reaming, pipe layout and pullback using the assistance of divers, barges and tug boats. Laura reviewed the bore geometry and alignment for construction feasibility and risk analysis. She performed pullback calculations and assisted in the development of a drilling fluid release strategy, necessary due to the significant elevation difference in the outfall alignment. Laura also developed a comprehensive cost estimate for bidding assistance and answered trenchless RFIs during the early phases of construction.

Dawson Creek Force Main, Hillsboro, OR

Project Geologist for the design review of more than 3,600 feet of 24-inch HDPE installed via horizontal directional drilling. Twin bores were proposed between 1,800 and 1,900 feet in length in a vertically stacked configuration underneath the Rock Creek drainage. Laura developed cost estimates for construction and provided hydrofracture, settlement, and cross contamination analysis to evaluate project feasibility. She assisted with pre-qualification of contractors and provided design recommendations including specification language, layout requirements and construction sequencing. Laura also performed technical review of trenchless plans and specifications. This project is currently in final design.

Harold Loop Water Upgrade, Anchorage, AK

Project Geologist for the feasibility analysis of 630 feet of 16-inch diameter HDPE pipeline installation via horizontal directional drilling. The proposed drill ran up a steep, densely wooded slope through dense sand with gravel, cobbles and possible boulders. Laura reviewed the existing geotechnical information and provided design recommendations including bore geometry, alignment, and pullback loads. She performed hydrofracture and settlement analysis, and developed a strategy for maintaining the required hydrostatic pressure due to the elevation difference of approximately 70 feet between entry and exit. Laura also developed a cost estimate to assist the owner with feasibility determination.

Metcalf Street Sanitary Sewer Improvement, Sedro Woolley, WA

Project Geologist for the post-construction review of approximately 1,315 feet of vitrified clay pipe varying from 15 to 21 inches in diameter replaced with 24-inch HDPE pipe via InneReam. The InneReam process installs new pipe while simultaneously removing the host pipe by "back-reaming" with a horizontal directional drill rig. Laura evaluated the post-construction surveys and records to determine cause of grade failure, and developed a report which was used for negotiations between the contractor and owner.

CHERRINGTON

Martin Cherrington
Owner

Project Role: Trenchless Constructability

Years with Firm

16

Professional Summary

Martin is recognized as the originator of horizontal directionally drilled river crossings and has made a significant contribution as a pioneer in HDD technology. It was through his first company, Titan Contractors,that he successfully completed the world's first river crossing in 1970-1971. Since that time, he has been granted over 18 patents related to horizontal directional drilling technology. He has authored articles in industry trade journals such as *Oil & Gas Journal* and *Trenchless Technology*, and given technical papers at several HDD Technology conferences.

Martin has set numerous milestones for developing the HDD industry. His unique understanding of downhole drilling dynamics has produced innovative solutions that have resulted in setting drilling standards within the HDD community. Martin's companies have completed more than 1,000 crossings in complex geological environments, under some of the most difficult operating conditions.

Relevant Project Experience

A-Line Replacement Project, South Tahoe Public Utilities District - 1,200 feet of 30-inch horizontal directional drilling installing a high-pressure wastewater effluent pipeline beneath an environmentally sensitive meadow and creek in the Lake Tahoe watershed. This project was completed under schedule and under budget, and resulted in no construction claims.

Norton Corrosion Limited

Dale Doughty, PE
Manager

Project Role: Corrosion

Education

BS, Physics
BA, Education

Registrations

Professional Engineer, Oregon

Years with Firm

34

Professional Summary

Dale is Past Chairman and Trustee of the Puget Sound Section of the National Association of Corrosion Engineers (NACE). He currently is a member of three NACE committees reviewing recommended practices for use by others in our industry. His professional experience of over 25 years focuses on planning, design, and management of corrosion engineering projects. He is NCL's Manager of Engineering and responsible for the overall management of corrosion engineering personnel and resources of the firm. Dale has participated in and managed corrosion engineering projects of all sizes, including field surveys, design and development of corrosion control systems for municipal, agricultural, and oil industry pipelines; thermal, nuclear and hydroelectric power plant condenser waterboxes; large and small diameter underground process piping; concrete rebar systems; underground storage tanks; and public and privately held marinas, piers, wharves, gate systems, sheet pile walls, and breakwaters.

Relevant Project Experience

- Investigated client concerns regarding AC mitigation of new coated steel petroleum products pipeline on 250 miles of pipeline traveling under the pipeline corridor containing 6 overhead high voltage power transmission lines and three regulated foreign products pipelines. Also performed a Stray Current Corrosion evaluation and cathodic protection design.
- Performed forensic investigation and stray current analysis leading to AC and corrosion mitigation for cross-country U.S. Gypsum natural gas pipeline. NCL conducts ongoing monthly monitoring and system maintenance.
- Performed stray current testing to determine effects of adjacent electrical rail system to Queens Midtown Tunnel and Brooklyn Battery Tunnel. Evaluated existing cathodic protection system for damage, prepared and delivered bid-ready repair specifications, and supervised repairs being implemented.

Chad Lukkarila

Experience
13 years

Education
MS, Geological Engineering, Michigan Technological University, 1999
BS, Geological Engineering, Michigan Technological University, 1996

Certifications/Registrations
Professional Engineer – WA, CO, IA, NV, HI, PA, NC, TX

Licensed Engineering Geologist – WA

BNSF Railroad Certification – WA

OSHA 40-hr HAZWOPER

EXPERIENCE SUMMARY

Chad Lukkarila's professional experience includes soil and r ock slope engineering, subsurface geotechnical explorations, soil nailing and construction observation. For Kleinfelder, his responsibilities include: field mapping for rock slop e engineering, kinematic analysis and engineering design for slope stabilit y, engineering design for rockfall hazards, rock and soil slide identification, mitigation, and design, water resources feasibility analysis, aerial photograph terrain analysis, field observation for soil nail walls, and construction observation. Mr. Lukkarila also coordinates and provided testing rock samples in Kleinfelder's accredited laboratory.

Currently he is working on the Cashmere WWTP and has coordinated on the 3rd party laboratory rock testing along the water line alignment for this Lake Oswego-Tigard water infrastructure project.

SELECT PROJECT EXPERIENCE

Olivenhain Municipal Water District; San Diego, California. As staff geolog ical engineer provided assessment on rock slope engineering problems for road cuts for the OMWD water treatment plant, power sub-station, and Olivenhain Dam. Line, window and outcrop mapping techniques was employed to map the rock mass. Geomech anical information and data was gathered and assessed for the following: Rock Mass R ating System (RMR), Rock Quality Designation (RQD), Rock Strength, ki nematics analysis by Markland Plots on Stere onets. Factors of safet y for fi nal rock slo pes were evaluated using the simp lified Janbu method of slic es for irregular s haped surfaces facilitated b y Xstabl. Engineering designs were provided for cut slope excavation, construction and rockfall mitigation by wire mesh netting. Reinforcement designs were provided for rockbolts. In addition, thir d party review was provided for other r ockslope engineering issues and rock bolt stabilization design.

John Wayne Pioneer Trail Tunnel Assessment, Washington State Parks and Recreation Commission; King and Kittitas County, Washington. Kleinfelder, in co-operation with its subc ontractors, SubTerra, Inc., ESA Adolfso n and Wiss, Janney, Elstner Associates, Inc. WJE have been contracted by the Washington State Parks and Recreation Commission (WSPRC) to develop and implement repairs for tunnels located on the John Wayne Pioneer Trail (JWPT), which runs through the Iron Horse State Park. The overall project encompasses five h istoric tunnels that were constructed between 1910 and 1915 for the Chic ago-Milwaukee-St. Paul-Pacific Railroad and are locate d in King and Kittitas Counties.

Tunnel assessment tasks includ ed data assimilation and pr eliminary drawing preparation, develop tunnel repair alternatives, tunnel and tunnel approach geotechnical assessments, preliminary risk assessments, permitting, and Olallie Creek culvert assessment and repair recommendations. As part of the geotechnical assessment Kleinfelder and SubTerra completed mapping and risk rating of three tunnels. As a project geological engineer, Mr. Lukkarila was responsible for the tunnel geotechnical assessments, development of a risk assessment rating matrix, stability assessments, summarizing the tunnel risk ratings, and report preparation.

The Dalles Dam Adult Fish Channel, U.S. Army Corps of Engineers; Portland District, Oregon. Rockslope design of fish channel. Provided assessment on rock slope engineering problems for a rock channel that was 200 feet long and 40 feet high on the Columbia River. Investigations included horizontal and vertical line traverses, window and outcrop mapping of the rock channel using mountaineering techniques. Geomechanical information and data were gathered and assessed for Rock Mass Rating System (RMR), Rock Quality Designation (RQD), Rock Mass Quality (Q-value), rock strength, kinematics analysis by Markland Plots on Stereonets. Provided engineering designs for rock bolt reinforcement. Developed health and safety plans and reviewed hydrogeology, dewatering plan, and monitoring well placement and pumping tests.

Folsom Dam Auxiliary Spillway, Folsom Dam, Army Corps of Engineers; Folsom, California. Kleinfelder performed geologic and geotechnical investigations and analysis to characterize the subsurface conditions for the development of the Folsom Auxiliary Spillway design. The proposed Folsom Auxiliary Spillway represents a major component of the Joint Federal Project between the U.S. Army Corps of Engineers and the U.S. Bureau of Reclamation. The Folsom Auxiliary Spillway is proposed as an overflow structure during flood events that would allow increased discharge of the reservoir in conjunction with continued discharge from the existing dam outlets and gate structures. This would take the place of the need to increase the main dam outlet capacity as proposed in previous Folsom Modifications projects.

Kleinfelder obtained, compiled, and summarized existing and ongoing data collection, perform preliminary analysis with which to make preliminary recommendations for spillway channel excavation design, perform subsurface geotechnical explorations and subsequent laboratory testing to augment existing data, and finally use the additional data to modify and update recommended design. The work addressed consideration of the stability of rock and soil cut slopes, scour potential of the spillway outfall and exit channel (to examine the consequences of an unlined versus lined channel), seepage potential of the rock slopes, excavatibility, constructability, aggregate suitability of the excavated materials, and geotechnical parameters for use in the spillway foundation evaluation. As a project geological engineer, Mr. Lukkarila was responsible for detailed line mapping, Markland stereonet analyses and slope stability analyses of the spillway slopes and recommendations for cut slope inclinations for the spillway slopes.

High Bridge #115 over No Name Creek Replacement Geotechnical Investigation; Whatcom County, Washington. The existing High Bridge #115 is a three-span continuous cast-in-place reinforced concrete bridge, with a cast-in-place reinforced concrete deck. In the winter of 1998, a slide occurred near the north abutment. The structure was not damaged, but the failure created a serious concern of further instability and its potential for damaging or undermining support for the north abutment, the northern set of interior columns, and a section of wing wall. Kleinfelder was retained to perform a geotechnical engineering study that consisted of reviewing existing geotechnical information for the bridge, performing a two-phase field investigation following recommendations in the W SDOT Geotechnical Manual, and completing geotechnical design criteria and specifications for the new bridge.

As field ge ological engineer, Mr. Lukkarila was responsible for the follo wing: geomechanical and geotechnical field mapping of sl opes below the existing bridge foundations and proposed new foundation locations, global stability analysis of sl opes, slope cut design, reinforcement type recommendations, rock fal l mitigation design, development of digital p hoto mosaic design plates for con struction, and assisting with preparation of the project Special Provisions for slope stability mitigation.

During project construction, Mr. Lukkarila was tasked with making slope reinforcement recommendations, providing foundation grading criteria, performing rock bolt and tieback performance testing while stabilizing rock outcrops and during the construction of a tieback retaining wall, inspection of the drilled shafts for the new foundation system, and providing general recommendations concerning the construction sequencing..

State Route 70 Design-Build; Lincoln County, New Mexico. The New Mexico State Highway and Transportation Department began field investigations for the 30% design of SR 70 between Ruidoso Downs and Riverside in Lincoln County, New Mexico during the summer of 2001. During the summer of 20 02 began design build for over 125 unstable slopes. The project inc luded detailed geomechanical/geological mapping of h ighway roadside rock and soil slopes for the 36-m ile highway design-build reconstruction. Mr. Lukkarila was a team lea der and mountaineering safety supervisor during the detail ed geological and geomechanical mapping of the rock and soil slopes. The Kleinfelder team mapped, in detail, 125 stations within the 40 mapping areas. The station areas consisted of 50-foot long by 100 feet high windows. Because of the height of the existing road cuts and the rugged desert terrain, vertical line mapping was completed using mountaineering techniques including rock climbing and rappelling.

The Kleinfelder team col lected geomechanical information pertaining to the t ype, orientation, aperture, surface roughness, persistence, and spacing of each discontinuity to be use d during the ki nematic analysis of each rock sl ope. The team also col lected Rock-Mass-Rating (RMR) information s uch as geologic fabric, block size, fracture orientation, fracture spac ing, Rock-Quality-Designation (RQD), intact rock uniax ial strength, and weathering of each geologic unit within the windows. To complement the detailed geologic and geomechanical mapping, the team s employed the Oregon Rock Fall Hazard Rating System and the Ritchie Ditch Criteria to assign a hazard rating to each highway roadside slope. This rating was used to identify and appropriate funds for the roadside slopes that are most prone to rockfall hazard. The Kleinfelder team used the collected data to complete kinematic and global stability analyses for the more than 125 rock and soil slopes. Kleinfelder provided stable cut slope and rockfall catchment area geometries for the project.

Mark Swank

Experience
11 years

Education
MS, Engineering Geology, San Jose State University, 2007

BS, Soil Science, California Polytechnic State University, San Luis Obispo, CA, 1999

Certifications/Registrations
Registered Geologist - OR
Certified Engineering Geologist - OR

OSHA 40-hr HAZWOPER

EXPERIENCE SUMMARY

Mr. Swank will serve as a Project Manager for the Lake Oswego-Tigard Water Partnership projects, with responsibilities including assembling a project team of qualified professionals (including specialty subconsultants), project scheduling, budget control, and communications with Kennedy/Jenks Consultants. He will be responsible for designing subsurface exploration programs, characterizing site geologic conditions, seismic analysis, and evaluation of potential hazards.

Some examples of related projects/contracts that Mark is or has managed recently include:

- CWS Geotechnical OnCall contract and associated projects
- PBOT geotechnical on-call projects
- ODOT geotechnical on-call projects
- Port of Portland geotechnical on-call projects
- National Solar projects for SunEdison and Element Power
- TriMet materials on-call projects
- COP OMF geotechnical on-call projects
- Element Power (national solar projects)

In addition to his project management experience, Mr. Swank has extensive experience with engineering, geologic, and environmental issues. His work has covered a wide range of interrelated disciplines attendant to geology, groundwater resources, solid and hazardous waste, including hydrogeology, engineering geology, fluvial geomorphology, geotechnical engineering, soils engineering, environmental science, pavement evaluation and design, foundations, and ground improvement. He has performed detailed geologic and geotechnical studies for numerous facilities, dams

SELECT PROJECT EXPERIENCE

Scoggins Dam, Clean Water Services, Forest Grove, Oregon
As a the Project Engineering Geologist on the Scoggins Dam Raise Project, Mark is providing technical expertise and geologic mapping, particularly focused on slope instability issues surrounding the rim of the reservoir and near the dam abutments. Scoggins Dam is a 151-foot-high zoned earthfill embankment dam located 5 miles southwest of Forest Grove in Washington County, Oregon. The Kleinfelder Team was retained to evaluate alternative scenarios, which included modification of the existing Scoggins Dam, raising Scoggins Dam 40 feet, and constructing a new dam downstream. Mark coordinated the geotechnical investigations, engineering, and conceptual designs for these dam alternatives and borrow source areas.

In addition, based on published geologic maps, the Scoggins fault potentially projects through the middle of the existing dam structure or thorough one of the abutments. Mark used as-built plans to identify fault indictors in the construction trenches to locate the possible fault trace. The activity of the fault is also unknown due to its relationship with the Gales Creek fault zone and Mt. Angel fault zone. Recent seismicity on the Mt. Angel fault zone indicates that the Scoggins fault, if connected, may be also active (<11,000 years). Working with DOGAMI and USGS researchers, Mark participated in fault trenching along an interpreted lineation and provided recommendations to Clean Water Services.

Blanton Street Water Quality Facility Retaining Wall, Clean Water Services, Beaverton, OR
Mr. Swank is the Project Manager for the project and overall Project Engineering Geologist. Kleinfelder was contracted by CWS to provide geotechnical field work and engineering designs for an Ultrablock retaining wall located adjacent to an existing and soon to be constructed water detention swales. Kleinfelder is also providing construction QA/QC for CWS through construction.

Condit Dam Decommissioning, PacifiCorp Energy, White Salmon, Washington
As the Project Engineering Geologist on the Condit Dam Decommissioning project for PacifiCorp Energy, Mark is providing technical expertise and has coordinated field activities, which involved considerable coordination between several consultants and extensive communication with PacifiCorp Energy to plan and design the decommissioning of this nearly 100-year old, 125-foot high concrete dam located on the White Salmon River within Klickitat and Skamania Counties, Washington. Mark contributed to the preparation of over 10 management plans and design documents supporting the decommissioning effort The plans and design documents were submitted to FERC as part of the Surrender Order requirements. In addition, Mr. Swank has lead field investigations for a proposed replacement water pipeline using Horizontal Directional Drilling (HDD) using a 14-inch diameter HDPE pipe through basalt bedrock; protection measures for Northwestern Lake Bridge; slope stability piezometers for the bridge; and a pavement conditions assessment.

After the dam removal and subsequent deepening of the river channels (White Salmon River and Buck Creek), significant erosion has caused bank and slope instabilities - adjacent to 22 cabin sites and Northwestern Lake Bridge. The investigations included using LiDAR imagery, chronological topographic maps, and performing field reconnaissance mapping. The chronological topographic maps were used to determine the extent of pre-dam deposits vs. the post-dam deposits to estimate the natural slopes and future erosion and evaluate the impact on adjacent structures. At one site, LiDAR imagery was interpreted and showed recent slumping and a potentially recent large-scale, deep-seated landslide underlying a cabin. This interpretative map was field verified and updated accordingly. Mark helped prepare technical reports with recommendations regarding the hazards and risks of the slopes to PacifiCorp Energy.

Willamette River Bridge, Eugene-Springfield, Oregon. As the current Project Manager and Field Program Manager, Mr. Swank coordinated the field exploration program for the design of a new bridge crossing the Willamette River in Eugene, Oregon. This project included replacing the existing Detour Bridge, removing the WRB, and replacing the bridge spanning Canoe Canal (also locally referred to as Patterson Slough). Appurtenant structures that will also be designed and constructed as part of this project include retaining and sound walls, luminaires, a sign bridge, a bicycle path and bridge, and drainage improvements (including bioswales, detention ponds, and infiltration ponds). The project also included a pavement design for the highway and ancillary roadways in the vicinity of the project. The field program cost over $500,000 and consisted of drilling borings, excavating test pits, performing infiltration tests, pavement coring, and traffic control. Explorations were performed throughout the project site and these locations included borings drilled through bridge decks, over-water borings, and borings on Interstate 5 and other roadways. Numerous permits were required and obtained through a variety of agencies and special drilling techniques were used to comply with a litany of environmental concerns.

In addition to coordinating the project field program, Mr. Swank also drilled numerous borings for the project using a variety of techniques which included HSA, mud rotary, casing advancer, and HQ rock coring. Borings drilled through bridge decks used satellite casing to the ground surface. The soils and rocks were logged in the field following ASTM D2487 and D2488. Rock samples were packaged and transported under ASTM D5079.

Denver Street Combined Sewer Overflow (CSO), Astoria, OR - Mr. Swank was the project manager and project geologist for a geotechnical investigation for a 3,500 foot long combined sewer overflow pipeline and 2.8 million gallon storage facility in Astoria, Oregon. The geotechnical services for the project included the methods excavation and ground support, groundwater control and dewatering, pipe support, storage facility types and foundations, trench backfill, effects of construction on adjacent structures and utilities and earthquake-related effects. Mr. Swank also managed the construction aspects of the project including inspector schedules, visits, and costs. The alignment encountered several different geologic settings and hydrogeologic conditions with deep open cuts in flowing and running ground that required dewatering and shoring systems.

Bond Street Water Line Replacement, Astoria, OR – Mr. Swank was the Project Manager for the geotechnical investigation supporting the design and construction of the new water line and associated pavement reconstruction. The project re-routed a water line to avoid a landslide that occurred years earlier along the south side of West Bond Street. The new 2,200-foot-long water line was installed at a depth of 6 feet below the existing ground surface using open-cut trench excavation methods. Additionally, one lane of Marine Drive was reconstructed. Scope of work included field preparation and exploration, laboratory testing, engineering analysis and reporting, and coordination of environmental services. Field exploration involved reviewing site geologic/geotechnical maps, coordination with utilities and subcontractors, obtaining necessary permits from City of Astoria and ODOT, exploring subsurface conditions with borings at depths up to 11.5 feet, classifying the materials encountered in the explorations in general accordance with American Society for Testing and Materials (ASTM) standards and maintaining detailed log, and recording groundwater observations.

BRIAN COPELAND, PE, PTOE
SENIOR PROJECT MANAGER

Education: BS, Civil Engineering, Oregon State University, 1992

Registrations: Oregon Civil No. 18503; Washington Civil No. 35767; ODOT Certified Traffic Signal Inspector No. 43349; Certified Professional Traffic Operations Engineer

Years of Experience: 20 (20 with DKS)

Mr. Copeland has extensive experience designing traffic engineering improvements for ODOT, City of Lake Oswego, Clackamas County, City of Portland, and many other public agencies throughout Oregon and Washington. Brian's projects include temporary traffic control, pedestrian and bicycle facilities, parking, roadway and pathway lighting, and signing and striping. He is experienced with intersection and roadway capacity analyses, circulation and access layouts, safety studies, traffic calming plans, traffic signal warrant analyses, turn lane requirements, and site distance requirements. His relevant experience includes:

EXPERIENCE

Lake Oswego Sewer Interceptor Replacement Engineering Services, OR. As project manager, Brian was responsible for temporary traffic control during construction, including reviewing temporary traffic control plans and field inspections of temporary traffic control configurations. Brian worked closely with the contractor and the City to ensure that all plans and traffic control configurations in the field met City, ODOT, and MUTCD standards.

Water Pipeline Traffic Control, Lake Oswego, OR. As traffic engineering task manager, Brian is currently developing final plans and specifications for temporary traffic control to accommodate traffic during the installation of new raw and finished waterline improvements in Lake Oswego. The project includes significant agency and stakeholder coordination, as the improvements impact not only City facilities, but also several neighborhoods and ODOT's Highway 43.

Airport Way/I-205 SB Off-Ramp Improvement Project, ODOT Region 1/Port of Portland, OR. As project manager, Brian was responsible for traffic operation analysis, traffic signal design, signing and striping, roadway lighting, and temporary traffic control during construction.

Central Point Highway 99 and Pine Street Improvements, OR. Brian was the traffic engineering task manager for the preparation of final PS&E for construction of intersection and traffic improvements along Pine Street in downtown Central Point. Improvements included a traffic signal modification near a railroad crossing, installation of ornamental lighting, modifications to signing and striping, pedestrian and bicycle facilities, and traffic control concepts during construction.

ODOT Downtown Corvallis Madison Avenue Improvements, Corvallis, OR. Brian managed traffic engineering tasks for the final design of pedestrian improvements along Madison Avenue in downtown Corvallis. The project included a parking impacts evaluation, pedestrian crossing designs, and temporary traffic control planning. Brian worked closely with downtown business owners to minimize impacts during construction.

Boones Ferry Road Refinement Plan (Phase II), Lake Oswego, OR. Brian, as traffic engineering task manager, developed a preliminary plan for improvements to a congested portion of Boones Ferry Road in the Lake Grove area of Lake Oswego. He prepared and evaluated design alternatives, which include turn lanes, medians, sidewalks, bike lanes, traffic signals, pedestrian crossings, and access modifications. Brian worked closely with the City, the public, and business owners to build consensus on the plan.

Tigard Gaarde/McDonald Intersection Improvements, ODOT/City of Tigard, OR. As traffic engineering task manager, Brian provided detailed traffic analysis for several alternatives during the alternatives analysis phase of the project. DKS is currently preparing final PS&E for a new traffic signal, roadway lighting, and permanent signing/striping.

TriMet Tigard Commuter Rail Study, OR. Brian was project manager for an evaluation of impacts from development of a commuter rail station and parking lot and an at-grade rail crossing in downtown Tigard. The study also evaluated traffic operation, pedestrian safety, and parking impacts.

Hillsboro Traffic Signal Improvements, OR. As project manager, Brian led the development of final PS&E for new traffic signals, signing and striping at the Shute Road/Butler Street and Stucki Avenue/Allie Avenue intersections. DKS provided recommendations for signal phasing and lane geometries based on future traffic volume forecasts. The project was constructed per the schedule and construction bids came in below the engineer's cost estimate. DKS also provided construction engineering support.

US 26 SE 51st to I-205 Preservation Project, ODOT. As traffic engineering task manager, Brian was responsible for final PS&E for four traffic signal modifications, detector loop replacement at 11 intersections, roadway lighting, and permanent signing and striping. DKS also prepared a traffic management plan for this project and provided construction support.

Hall Boulevard Pedestrian Crossing Design, City of Tigard, ODOT, OR. As project manager, Brian led the preparation o final PS&E for the installation of a solar-powered pedestrian warning signal in Tigard. At the onset of the project, an evaluation of the crossing location was conducted and a recommended design concept was provided to the City. Since this crossing is located on an ODOT facility (Hall Boulevard), Brian worked closely with both the City and ODOT to build consensus and gain approval of a design.

Tigard Walnut Street Feasibility Study, City of Tigard, OR. As project manager, Brian led the development and evaluation of several alternative alignments for extending Walnut Street between downtown Tigard and OR 99W. For each alternative, the study identified opportunities and constraints, safety elements, right-of-way and access impacts, and a construction cost estimate.

ODOT Beltline Road Improvements (Unit 1 and 2), Eugene, OR. As traffic engineering lead, Brian designed final plans, specifications, and an engineer's cost estimate for permanent signing and illumination improvements as part of the Beltline Interchange improvements in Eugene, Oregon. This project included illumination along a multi-use pathway.

JCB/Bell Bike Signal, Portland, OR. As project manager, Brian developed final plans, specifications, and an engineer's cost estimate for the modification of a traffic signal to include an signalized bicycle crossing at the intersection of Johnson Creek Boulevard and Bell Avenue in Portland, OR. This crossing is part of the regional Springwater Corridor Multi-use path.

Durham Elementary Improvements, Tigard, OR. As traffic task manager, Brian led the development of final PS&E for one signal modification, a new street lighting system, and permanent signing/striping associated with improvements to the Durham Elementary site. He also provided engineering services during the construction phase of the project.

DKS

MONICA LEAL, EIT
TRANSPORTATION ENGINEERING ASSOCIATE

Education: MS, Civil Engineering, Portland State University, 2002; BS, Civil Engineering, Javeriana University, Bogotá, Colombia, 1997

Registrations: Oregon EIT No. 75113; Certified ODOT Traffic Signal Inspector

Years of Experience: 13 (10 with DKS)

Areas of Expertise: Roadway lighting design, temporary traffic control, traffic operations analysis, traffic signal operations, traffic signal design, roadway signing and striping, capacity analysis, traffic impact studies, safety studies, construction services, and traffic signal inspection

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Ms. Leal has extensive experience throughout Washington and Oregon in the design of traffic signals, roadway signing and striping, roadway and pathway lighting, and temporary traffic control during construction. Monica has helped prepare intersection and roadway capacity analyses, safety studies, traffic signal warrant analyses, turn lane requirements, and site distance requirements. Her relevant experience includes:

EXPERIENCE

Lake Oswego Sewer Interceptor Replacement Engineering Services, OR. As project engineer, Monica responded to inquiries about temporary traffic control during construction, reviewed temporary traffic control plans, and conducted field inspections of temporary traffic control configurations. Monica worked closely with the contractor and the City to ensure that all plans and traffic control configurations in the field met City, ODOT, and MUTCD standards.

Water Pipeline Traffic Control, Lake Oswego, OR. As a project engineer, Monica is currently developing temporary traffic control PS&E to accommodate traffic during the construction of the raw water and finished water pipelines project in Lake Oswego, West Linn, and Gladstone, Oregon.

ODOT I-5 and Bridge Vertical Clearance Improvements, Linn County and Lane County, OR. Monica, as project engineer, prepared the PS&E and supported construction for signing, striping, and temporary traffic control at 12 bridges. This project included work along Centennial Boulevard and I-105 in the Eugene/Springfield area.

East Burnside/Couch One-Way Couplet Final Design, City of Portland, OR. As project engineer, Monica was responsible for the traffic engineering design for a couplet system with E Burnside and NE Couch Street between NE 14th Avenue and NE 3rd Avenue. The project included 22 new and 6 modified traffic signal systems, temporary traffic control, traffic signal interconnect, roadway lighting, signing, and striping designs. Monica also led the project's lighting design.

Trolley Trail Final Design, Clackamas County, OR. As project engineer, Monica prepared final PS&E for two traffic signal modifications and a flasher beacon system for final design of the bicycle and pedestrian path.

ODOT Sunnyside Road Improvement Project Phase 2, Clackamas County, OR. Monica, as project engineer, prepared PS&E for 16 traffic signals, 4.25 miles of roadway lighting, signing, and striping.

ODOT I-5 and Green Springs Highway, Exit 14, Bundle 316, OR. As project engineer, Monica prepared PS&E and provided construction support services for two new traffic signals and interchange roadway lighting. Monica conducted lighting analysis using AGI32 and led the lighting coordination with the state lighting engineer.

ODOT I-5 and Valley View Road, North Ashland Interchange, Bundle 314, Ashland, OR. As project engineer, Monica prepared PS&E and provided construction support for the interchange roadway lighting. Monica conducted lighting analysis using AGI32 and led the lighting coordination with the state lighting engineer.

Oregon City Main Street: 5th Street and 10th Street, OR. As project engineer, Monica prepared the final PS&E for two traffic signal modifications, roadway lighting, and the interconnect system. Monica was the lead lighting designer and conducted a lighting analysis, voltage drop calculations and led the effort to obtain state approval of the light pole and foundation designs.

Tigard Main Street: Johnson Street to Tigard Street, OR. Monica, as project engineer, prepared the final PS&E for two traffic signal modifications, flasher beacon system, roadway lighting, and interconnect system.

Jackson County East Pine Street: I-5 to Peninger Road, OR. As project engineer, Monica prepared PS&E for signing and striping and provided construction support for a traffic signal modification. She also prepared a traffic study that included intersection capacity analysis and turn-lane requirements.

Burnham Street Lighting, Tigard, OR. Monica, as the design engineer, provided final PS&E for the implementation of a new LED ornamental street lighting system along Burnham Road, a commercial collector roadway within the City of Tigard. Monica conducted a detailed lighting analysis to compare high pressure sodium (HPS) and light emitting diode (LED) lighting systems to meet the currently published national standards. Key components for the project included developing and recommending light level requirements and selection of viable luminaire options based on current national standards.

City of Portland Street Lighting Design Projects, OR. As project engineer, Monica has completed over 30 street lighting design projects for the City of Portland. Project locations have ranged from the Central Business District, to the South Waterfront, the River District, the South Auditorium District and other areas throughout Portland. Projects have involved preparation of PS&E, light level analyses, circuit diagrams, design details, and field investigations of existing lighting systems. Monica has extensive knowledge of the City of Portland's street lighting requirements and key plan review elements.

ODOT Myrtle Creek Bridge Improvements, Douglas County, OR. As project engineer, Monica prepared final PS&E for three temporary traffic signals and roadway lighting. The project included a traffic analysis to evaluate detour options during bridge reconstruction.

Peter Kreft, PE

Project Manager

OFFICE LOCATION

MWH
Portland, OR

POSITION/TITLE

Principal Engineer

TOTAL YEARS OF EXPERIENCE

33

YEARS WITH MWH

33

EDUCATION

MS, Environmental Engineering, University of California, Irvine, Magna Cum Laude

BS, Civil and Environmental Engineering, University of California, Irvine

LICENSES/CERTIFICATIONS/AFFILIATIONS/MEMBERSHIPS

Professional Engineer (Civil) – OR, WA, CA

Environmental Engineer – OR

Grade IV Water Treatment Plant Operator – CA

CAREER SUMMARY

Peter (Pete) Kreft has over 33 years of experience as a project manager, technical advisor, and process engineer for water quality and potable water applications, and is a recognized leader in water treatment process design in the region. He has involvement in the evaluation, planning, design, construction, and operation of direct, conventional and membrane filtration treatment facilities in Oregon, Washington, Idaho, Montana, Alaska, British Columbia, California, Nevada, Utah, Texas, Arizona, and Colorado, including some of MWH's largest and most complex treatment projects. Pete's project management experience spans the entire life of a treatment project, from pilot testing through start-up/commissioning, with an emphasis of state-of-the-art treatment processes, including: ozonation, high-rate clarification, and deep-bed granular media filtration. Pete is a principal engineer in the MWH Portland office.

RELEVANT PROJECT EXPERIENCE

EXPERT PANEL MEMBER, WATER TREATMENT PLANT (WTP) EXPANSION/UPGRADE, CITIES OF LAKE OSWEGO AND TIGARD, OR. Pete recently assisted the Cities with major decisions regarding the planned expansion of an existing direct filtration WTP from 16 to 38 mgd. The plant treats water from the Clackamas River, situated on a tight site, requiring a space-saving approach. High-rate clarification will be implemented as well as intermediate ozonation and deep-bed biological filters. Mechanical dewatering will be used for solids handling/dewatering to minimize space impacts.

TECHNICAL ADVISOR, WATERMAN WTP EXPANSION/UPGRADE, CITY OF FAIRFIELD, CA. Pete participated during preliminary design and detailed design of this expansion/upgrade project. The plant's source water is the Putah South Canal. The original horizontal-flow flocculation and sedimentation basins were replaced with a high-rate clarification process (Actiflo), the original raw water ozonation system was converted to intermediate (settled water) ozonation, and the original shallow media filters were re-built with deep-bed dual media, along with construction of new filters. The preferred process was pilot-tested over a wide range of raw water quality conditions. The upgraded plant now operates as intended.

PLANNING AND PRELIMINARY DESIGN LEAD, NORTH CLACKAMAS COUNTY WATER COMMISSION WATER TREATMENT PLANT EXPANSION, SUNRISE WATER AUTHORITY, CLACKAMAS, OR. The fast-track project consisted of a new 10-mgd US Filter-Memcor submerged microfiltration membrane system (direct filtration of Clackamas River water), new treated water clearwell and high-service pumping improvements, pre-treatment facilities, sludge lagoons, other ancillary systems, plus a complete removal and replacement of the programmable logic controllers system for the existing portion of the plant. One of the very first submerged microfiltration membrane plants in Oregon and currently one of the largest in the US. This process was considered more robust than the existing slow sand filtration process, requires less operator attention compared to conventional filtration technology, and allows this part of the plant to remain in service during high turbidity events. MWH successfully completed this project within a two-year period to allow additional capacity to be available prior to the summer high-demand season.

PROJECT ENGINEER, VINEYARD SURFACE WTP, SACRAMENTO COUNTY WATER AGENCY, SACRAMENTO, CA. Pete served as project engineer for the preliminary design of this new 50-mgd conventional WTP using the Sacramento River as its source. This new water supply helped the county serve its growing customer base as well as reduce its reliance on groundwater. Pete also served as quality assurance and quality control reviewer for the detailed design for this plant. Pete developed water quality and operational goals for the project as well as an evaluation of various treatment processes, including pilot testing of membrane filtration. The plant includes horizontal flocculation and sedimentation basins followed by deep-bed granular media filters, and centrifuges and thickeners used for solids dewatering. The site and hydraulic profile were arranged for future processes including taste and odor (T&O) control and ultraviolet (UV) disinfection. As construction of the plant nears completion, Pete assists with startup, operator training and Operations and Maintenance (O&M) Manual development

PROCESS ENGINEER, DUCHESNE VALLEY WTP EXPANSION, CENTRAL UTAH WATER CONSERVANCY DISTRICT, DUCHESNE, UT. Pete served as process engineer for the preliminary design, pilot plant studies, and design of the expansion of this existing direct filtration plant from 4 to 8 mgd. Pete developed water quality and operational goals for the project and prepared the pilot testing plan. The pilot testing was focused on disinfection by-product (DBP) control and validated that pre-ozonation was the optimum oxidation process to reduce THM and HAA concentrations, as well as for T&O control, enhanced filter performance, reduced solids production, and primary disinfection. The expanded plant will continue to use direct filtration as the turbidity removal process, using new deep-bed, dual-media filters, with pre-ozonation and flocculation preceding filtration. The site and hydraulic profile were arranged for future processes including clarification (DAF) and UV disinfection. Pete assisted with startup during Spring 2010 resulting in a fully operational plant.

PROJECT MANAGER, SOUTH FORK WATER BOARD WTP UPGRADES AND FACILITY PLANNING, OREGON CITY, OR. Pete has managed and designed numerous improvements and upgrades at the South Fork Water Board WTP over the past decade, and recently completed a Facility Plan to expand the plant capacity and upgrade various components over the next 20+ years. The South Fork Water Board WTP is the oldest plant treating Clackamas River water and uses conventional treatment with clarification and deep-bed granular media filters. Improvements have included:

- Upgrading filter media to increase capacity and improve performance
- Adding filter-to-waste system
- Adding new rapid-mix system and new chemical feed facilities
- Re-building the filter pipe gallery including new electric-actuated control valves and flow meters
- Replacing old horizontal flocculators with hydraulic flocculation (baffle wall) system

PROJECT MANAGER, JOINT WATER COMMISSION WTP SOLIDS HANDLING AND DISPOSAL PROJECT, FOREST GROVE, OR. Pete recently managed this effort to evaluate the WTP's solids dewatering system and develop a plan for removal and disposal of the solids at a local landfill.

Jude Grounds, PE

Deputy Project Manager, Preliminary Design – Lead, Startup & Training

OFFICE LOCATION

MWH
Portland, OR

POSITION/TITLE

Principal Engineer

Northwest Regional Water Practice Leader

TOTAL YEARS OF EXPERIENCE

12

YEARS WITH MWH

12

EDUCATION

MS, Environmental Engineering, University of Colorado

BS, Civil Engineering, University of Colorado

LICENSES/CERTIFICATIONS/ AFFILIATIONS/ MEMBERSHIPS

Professional Engineer (Civil) – OR

Water Treatment Committee Chair – American Water Works Association (AWWA)

CAREER SUMMARY

Jude Grounds' primary experience is in the area of water and wastewater treatment plant process planning, design, construction, and start-up/commissioning. Jude has pilot- and full-scale experience evaluating the impacts of various treatment technologies on the chemical, physical and microbiological quality of drinking water and treated effluent. Additionally, he has served as project/resident engineer during design, construction and start-up of numerous treatment facilities, with an emphasis on expansion of existing treatment facilities. In the past year alone, Jude completed five water treatment plant (WTP) retrofits very similar to the proposed Lake Oswego WTP Expansion, including high-rate clarification, integration of intermediate ozone into and existing plant and biological filtration (BAF).

Jude serves as a Principal Engineer in our Portland Office. He has held various technical positions within MWH, and currently serves as the Northwest Regional Water Practice Leader. In addition, he currently serves as the active Chair for the Pacific Northwest Section American Water Works Association Water Treatment Committee.

RELEVANT PROJECT EXPERIENCE

PROJECT MANAGER/RESIDENT ENGINEER, TRI-CITY WATER POLLUTION CONTROL PLANT (WPCP) PHASE 1 EXPANSION, WATER ENVIRONMENT SERVICES (WES), OREGON CITY, OR. This project involves the $80M expansion of the existing conventional activated sludge (CAS) process, with 10 mgd of membrane bioreactors (MBR). Additionally, the design included several innovative sustainable technologies, including "green" roofs, "green" roads and bioswales (for natural storm water treatment and infiltration) and 15 mgd of wastewater reuse capability. Jude was responsible for overall design management, project coordination, and procurement efforts in addition to leading the process/mechanical design. The project was designed under a very tight schedule, requiring several innovative procurement techniques, including: Membrane System Supplier (procured at 30 percent design), Construction Manager/General Contractor (CM/GC) (procured at 50 percent design), and major process equipment (procured at 90 percent design). In his role as resident engineer, ***Jude helped maintain on overall net positive 1.5 percent change order, and worked with the CM/GC to reduce the overall project schedule by 2-months.*** Once on-line, the expanded plant will represent one of the largest applications of MBR technology in the Pacific Northwest.

DESIGN MANAGER, NORTH CLACKAMAS COUNTY WATER COMMISSION (NCCWC) WTP EXPANSION PROJECT, SUNRISE WATER AUTHORITY, OREGON CITY, OR. The $13M project ultimately increased the plant production by 15 mgd through the installation of submerged membrane filtration and associated facilities. The expanded facility is an interesting combination of new and old, combining the earliest filtration technology, slow sand filters, with the latest in technology, Microfiltration, working side by side on the same site. The project was fast tracked to meet the client's immediate needs for additional water supply; MWH used several innovative procurement and contracting techniques to move from Notice to Proceed (NTP) for design, to "making water" in 17 months including Membrane System Supplier (procured at 20% design) and CM/GC (procured at 80% design). As design manager, Jude was responsible for overall project coordination in addition to leading the process, mechanical and civil design. ***In his role as resident engineer, Jude helped create an overall net positive 2.3 percent change order.***

PROJECT ENGINEER, DISINFECTANT BY-PRODUCT (DBP) CONTROL PROGRAM, ANTELOPE VALLEY AND EAST KERN (AVEK), PALMDALE, CA. AVEK owns and operates four WTPs, located in Los Angeles County, with a combined capacity of approximately 150 mgd. These plants employ conventional treatment processes (i.e. coagulation /flocculation /sedimentation/ filtration) to treat State Project Water drawn from the east branch of the California Aqueduct. To meet impending DBP Rule requirements, each of the four plants required installation of a new ozone generation building and contact basin, replacement of the existing filter media and underdrains with new granular activated carbon (GAC) and plastic block underdrains, and a new chloramine contact basin and associated chemical feed systems. Following design, AVEK hired MWH Constructors to serve as the CM at Risk Contractor for project execution. As project engineer, Jude was responsible for the planning and review of the pilot study, ozone system preliminary design and pricing agreement package preparation, process and mechanical design of the filter improvements and bid-package development and preparation.

DESIGN MANAGER, WATERMAN WATER TREATMENT PLANT EXPANSION AND MODERNIZATION PROJECT, CITY OF FAIRFIELD, CA. The existing 15-mgd conventional WTP was expanded to 30 mgd. The expansion included conversion of the existing pre-ozonation, to intermediate ozonation, replacement of the conventional flocculation and sedimentation basins with high rate ballasted coagulation and sedimentation (Actiflo), and a retrofit and expansion of the existing filters to include deeper media and air scour. As design manager, Jude was primarily responsible for the pilot study planning and review during predesign; during design, he was responsible for overall project coordination as well as process and mechanical design of the Actiflo process and the filter expansion/improvements.

RESIDENT ENGINEER, WILLAMETTE RIVER WTP, CITY OF WILSONVILLE, OR. The new $45M WTP was constructed under a design build contract with the City of Wilsonville. The 15-mgd plant employs ballasted coagulation/ sedimentation (Actiflo), intermediate ozonation, and GAC filtration. As resident engineer, Jude assisted in the design of the ozone, Actiflo and chemical feed systems, and performed on-site engineering during construction and start-up.

PROJECT ENGINEER, WEYMOUTH WTP FILTER IMPROVEMENTS, METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA, CA. Jude served as project engineer during design for the Metropolitan Water District (MWD) of Southern California's 520-mgd Weymouth WTP Filter improvements. The project involved retrofit of four of the 50 10-mgd filters with alternative configurations ranging from media replacement to underdrain and trough replacement. The retrofit was being delivered via a Design/Build contract. Relative performance of the four new filter configurations will be monitored by MWH for one-year. Based on the results, all 50 filters at the plant will be retrofit with the "optimum" filter design under an extension to the design-build contract. Jude was responsible for the overall project coordination, filter design and report writing.

Mike Faha, RLA, LEED AP

Design Support: Landscape Architect
GW's Project Manager and Design Lead

OFFICE LOCATION

GreenWorks (GW)
Portland, OR

POSITION/TITLE

Principal

TOTAL YEARS OF EXPERIENCE

26

YEARS WITH GW

23

EDUCATION

BS, Oregon State University

LICENSES/CERTIFICATIONS/ AFFILIATIONS/ MEMBERSHIPS

Registered Landscape Architect – OR

LEED Accredited Professional: US Green Building Council – Leadership in Energy and Environmental Design

Member – American Society of Landscape Architects (ASLA)

CAREER SUMMARY

Mike Faha is a registered landscape architect and a founding Principal of GreenWorks. Mike's primary professional interest is in creating livable, sustainable communities that balance economic, ecological, and social needs. Towards that end, Mike leads planning and design project teams, which integrate urban ecology, green infrastructure, and urban design on a variety of project types. These include civic and institutional, corporate, recreation and open space, public infrastructure, housing and mixed used, and urban revitalization.

Mike is adept at working with clients, regulators, and stakeholders in creating projects with broad support. His prior employment with engineering, ecological and landscape architectural firms helped to propel him into a leadership role that integrates various professional disciplines, and helps clients meet broad-based community design objectives.

RELEVANT PROJECT EXPERIENCE

PRINCIPAL, Tri-City Water Pollution Control Facility, Clackamas County, Clackamas, OR

PRINCIPAL, Lake Oswego Water Treatment Plant, City of Lake Oswego, OR

PRINCIPAL, Bull Run Water Supply Improvements, Portland Water Bureau, Portland, OR

PRINCIPAL, Tryon Creek WWTP, City of Lake Oswego, OR

PRINCIPAL, Boones Ferry Road Green Street, City of Lake Oswego, OR

PRINCIPAL, Fernhill/Forest Grove Master Plan, Clean Water Services, Forest Grove, OR

PRINCIPAL, Low Impact Development Handbook, Clean Water Services, Hillsboro, OR

PRINCIPAL, Clackamas County Stormwater Standards, Water Environment Services, Clackamas, OR

PRINCIPAL, Durham Wastewater Treatment Facility, Clean Water Services, Portland, OR

PRINCIPAL, Gresham Wastewater Treatment Facility, City of Gresham, OR

PRINCIPAL, Teufel Water Reservoir, Tualatin Valley Water District, Portland, OR

Jerry Jacksha, PE

Design Support: Geotechnical
S&W's Project Manager and Design Lead

OFFICE LOCATION

Shannon & Wilson, Inc. (S&W)
Lake Oswego, OR

POSITION/TITLE

Senior Associate/Senior Geotechnical Engineer

TOTAL YEARS OF EXPERIENCE

37

YEARS WITH S&W

5

EDUCATION

MS, Civil Engineering, University of Idaho

BS, Civil Engineering, University of Idaho

LICENSES/CERTIFICATIONS/ AFFILIATIONS/ MEMBERSHIPS

Professional Engineer (Civil) – OR, WA, ID, VA

Professional Engineer (Environmental) – OR

CAREER SUMMARY

Jerry Jacksha is a senior project manager with more than 37 years of geotechnical engineering experience in all project phases, including facility siting, alternative studies, and conceptual engineering; preliminary and final design; preparation of construction drawings and technical specifications; construction observation and management; dispute resolution during construction closeout; and post-construction activities. He has worked on dozens of water, wastewater, and conveyance projects including treatment facilities, deep pump stations and basins, pipelines, and various types and configurations of steel and concrete reservoirs including elevated, precast-post tensioned concrete and exposed, completely buried, and lined ponds. Conveyance experience includes deep gravity sewers, trenchless installations including boring and jacking, microtunneling, and horizontal directional drilling (HDD). His shoring experience includes caissons, interlocking sheet piles and H-piles with tie-backs, soldier pile/tiebacks and lagging systems, secant piles, soil-mixing walls, slurry wall systems, and ground freezing. His dewatering experience includes deep wells, eductors, wellpoints, drainage collection trenches, and horizontal drilled wells. His geotechnical experience in deep caissons and shafts includes primarily deep pump stations, intake structures and trenchless shafts from 10 to 100 feet in diameter, and to depths up to 90 feet, in nearly all types of soil conditions, including flowing sands, open-work gravels, soft and stiff silts and clays, organic soils such as peat, and cemented gravels and weak sedimentary rock.

RELEVANT PROJECT EXPERIENCE

LEAD GEOTECHNICAL ENGINEER, WILLAMETTE RIVER WATER TREATMENT PLANT PIPELINES, CITY OF WILSONVILLE, OR. Jerry was lead geotechnical engineer for the design/construct team for design of the 35-mgd water treatment plant and raw water intake pipeline from the Willamette River near Tualatin, Oregon. The raw water intake, a 60-inch diameter permalock pipeline, was constructed as a microtunnel from a 100-foot deep intake wet well approximately 300 feet into a coffer dam in the river, which continued as an underwater cut to a screened intake structure supported and protected with underwater H-piles. The finished water line was also a 72-inch diameter permalock pipeline approximately 2,000 feet long with three open-face tunnels with groundwater control at two undercrossings approximately 100 feet below streams and wetlands, and one undercrossing of a main four-lane roadway of about 150 feet. The subsurface materials at the undercrossings were cobbles and boulders up to 4 feet in diameter in a sandy silt matrix with saturated conditions. Alternatives considered were pipe ramming, boring and jacking with a closed faced shield, and open faced excavation with groundwater control. Project accomplished while with another firm.

LEAD GEOTECHNICAL ENGINEER, TRI-CITY WASTEWATER TREATMENT PLANT INTERIM MEMBRANE BIOREACTOR EXPANSION, WATER ENVIRONMENT SERVICES, OR. This project consisted of an expansion of a membrane wastewater treatment facility with a membrane bioreactor for additional treatment which adds an additional 10 million gallons of water to the Clackamas County Service District's supply. The plant's process expansion added a deep aeration basin and several other buildings. The design included evaluations of seismic liquefaction and settlement, and potential for lateral spreading toward the Clackamas River to a distance of 700 feet. Jerry's work consisted of site explorations; seismic evaluations; geotechnical input to conceptual layouts; evaluation of the deep pump station excavation using caisson and tremie methods versus open-cut; excavations, dewatering, and slope stability requirements; and foundation design.

LEAD GEOTECHNICAL ENGINEER, NEWBERG WATER TREATMENT PLANT IMPROVEMENT, NEWBERG, OR. Improvements to the Newberg Water Treatment Plant located on a bluff above the Willamette River. Jerry's geotechnical work consisted of support to the City for improvements to the backwash lagoon and in a later phase worked with a consultant for building and pipeline additions to the plant. His work also consisted of an overall evaluation of slope stability, foundation and drainage design, and evaluation of buried structures.

PIPELINE AND PUMP STATION SENIOR REVIEW, LAKE OSWEGO INTERCEPTOR UPGRADE (LOIS), CITY OF LAKE OSWEGO, OR. The project consists of replacing most of, and rehabilitating the rest of, an existing sanitary trunk sewer system, comprised of nearly 28,000 feet of 12- to 36-inch diameter cast iron and concrete cylinder pipe constructed in the early 1960s. Of this total length, 24,000 feet lie within the main lake, bays, and canals of Oswego Lake, and the remaining 4,000 feet of length is on land, between the east end of the lake and the Tryon Creek Wastewater Treatment Plant. The line at both the west and east ends of the lake, including in the bays and canals, is buried or at grade on the lake bottom, while much of the line in the main lake, more than 9,000 feet, is supported above the lake bed on a pile foundation. On-land work includes a new pump station and approximately 5,000 feet of new pipeline under Kelok and Bryant Roads. After evaluation of a number of alternatives, a new route through the lake has been selected that includes a wide variety of geotechnical and construction challenges. The soil profile is highly variable between alluviums, peat, gravel, boulders, and basalt rock. Through the main lake area, the unique system will consist of a buoyant HDPE pipeline tethered to bedrock through a highly variable, and locally very thick, soft mud profile. Rock anchors will secure the tethers. Other portions of the system require deep foundations or subgrade stabilization to provide stability in liquefiable soils. Jerry was senior review for pipelines and pump stations.

LEAD GEOTECHNICAL ENGINEER, BALCH CONSOLIDATED CONDUIT, CITY OF PORTLAND, OR. Jerry is lead geotechnical engineer for predesign, design, and preparation of geotechnical-related plans and specifications, including a geotechnical baseline report, and construction support for this project, currently in the construction phase. Explorations studied five different alternative routes for a 7,500-linear foot, 84-inch diameter buried conduit under a highly developed industrial portion of north Portland. The anticipated depth of the pipeline is between 30 to 70 feet, and is planned to be constructed with a microtunneling (trenchless) method for essentially its entire alignment. There are currently six main deep shafts, each between 35 to 80 feet deep, and numerous diversion and manhole structures. The pipeline routes through Guild Lake, once a 400-acre marshy cutoff of the Willamette River, and site subsurface conditions consist of saturated very soft lake sediments, dredge sand fill, and native silts, sands, and gravels with cobbles and boulders.

Yuxin (Wolfe) Lang, PE, GE | Associate

Geotechnical Engineer

EDUCATION

MS, Civil Engineering, University of Waterloo (2002)
BS, Geological Engineering, Hebei Institute of Civil Engineering (1993)

REGISTRATION

Professional Civil Engineer with Geotechnical Discipline, Oregon, 78866 (2007)
Professional Civil Engineer, Washington, 44381 (2008)

PROFESSIONAL SUMMARY

Wolfe Lang has more than 18 years of geotechnical engineering experience. He has a strong background and experience in analyzing and designing various foundations and soil retaining structures, especially under complicated subsurface conditions. He is experienced in seismic ground motion characterization analysis, liquefaction analyses, post-liquefaction settlement analyses, post-liquefaction soil residual-strength evaluations, and seismic soil-structure design. He has completed many water, wastewater, and conveyance projects including treatment facilities, deep pump stations, pipelines, and reservoirs. Wolfe's other areas of expertise include retaining wall and shoring design, landslide remediation, soil improvement, shallow foundation design and settlement analysis, and construction consultation. Wolfe's other areas of expertise include retaining wall and shoring design, landslide remediation, soil improvement, shallow foundation design and settlement analysis, and construction consultation.

RELEVANT EXPERIENCE

Bull Run Supply Treatment Improvements | Clackamas County, OR (2010–2011)

Lead geotechnical engineer for the geotechnical evaluation of the new facilities at Bull Run Headworks, which consist of a UV light disinfection process building, Chorine storage building, operations building, new conduits, retaining walls and roadway improvements. The geological challenges include slope instability, seismic hazards, shallow groundwater, large diameter boulders, and deep excavation. The geotechnical investigation included field exploration of 20 soil/rock borings, groundwater monitoring wells, inclinometers, and geophysical testing. Geotechnical engineering evaluations included seismic slope stability analysis to define the slope failure zone under seismic loading condition, deep and shallow foundation evaluations, retaining wall and shoring evaluation, groundwater seepage evaluation, and ground settlement evaluations. Based on these exploration and evaluation results, we developed a seismic slope failure influence zone to assist the planning of the proposed structure and pipeline locations and depths; developed foundation design recommendations, and shoring and dewatering recommendations; conducted shoring and retaining wall design; and reviewed and prepared plans and specifications.

Bend Sourcewater and Treatment Plant Improvement Project | Bend, OR (2010–present)

Project manager for the geotechnical evaluation of the new improvements, which consist of a 10-mile-long new conduit, improvements for the existing intake and diversion dam, a hydropower plant, and a treatment plant. The geological challenges include shallow bedrock, embankment stability, seismic hazards, shallow groundwater near intake and at creek crossings, and large-diameter boulders. The investigation and evaluation include field exploration of about 100 test pits, large-diameter auger bores, and deep soil/rock borings; geotechnical analysis and recommendations for slope stability, seismic fault hazards, foundation design for the power plant and treatment plant, creek crossing design, and trench dewatering; preparation of geotechnical reports; and review and preparation of plans and specifications.

7.0 MG Ridgewood View Reservoir | Beaverton, OR (2012)
Project manager for the geotechnical evaluation of the new 7.0 MG Ridgewood View Reservoir to replace the aging Hyde Park Reservoir and Inglewood Reservoir for Tualatin Valley Water District (TVWD) in Beaverton, Oregon. Geotechnical field exploration program consists of eight soil/rock borings and geophysics testing. Geotechnical engineering evaluations include a site-specific seismic hazards and mitigation evaluation, reservoir siting alternative assessment, foundation options evaluation, bearing capacity and settlement evaluations. We are currently in the process of finalizing reservoir alternative recommendation and detailed reservoir foundation recommendation will be developed in the next design phase.

5.0 MG Cleveland Reservoir and Pump Station | Gresham, OR (2012)
Project manager for the geotechnical evaluation of the new 5.0 MG Cleveland Reservoir and Pump Station for Rockwood Water People's Utility District (PUD) in Gresham, Oregon. Geotechnical field exploration program consists of four soil borings and four test pits. Geotechnical engineering evaluations include a site-specific seismic hazards and mitigation evaluation, foundation options evaluation, bearing capacity and settlement evaluations. The exploration data and evaluation results were used to develop foundation design recommendation for the reservoir and pump station, and the foundation excavation and earthwork construction recommendations.

Tooze Road Reservoir Siting Study | Wilsonville, OR (2011)
Project manager for a geotechnical investigation in support of the site assessment and site selection of two reservoirs in Wilsonville. Geotechnical services provided includes field explorations of five soil borings, laboratory testing program for soil corrosive potential, compressibility and shear strength, and groundwater condition assessment.

Gabbert Road Reservoir Geotechnical Evaluation | Gresham, OR (2011-2012)
Lead geotechnical engineer for a geotechnical investigation in support of the site assessment and design of one reservoir in Gresham. The reservoir is up to 2.5 MG in size to replace the existing 0.2-MG Gabbert Reservoir. Geotechnical explorations consisted of three borings. Engineering analysis included slope stability analysis, foundation bearing and settlement analysis, ground improvement evaluation, and other construction issue assessments.

Gearhart WTP, Reservoir and Pipeline | Gearhart, OR (2010-present)
Project manager for a geotechnical investigation in support of the design and construction of the new water treatment plant and a new 1-MG terminal reservoir. The new WTP consists of a treatment building, a backwash tank, and two clear wells. The new terminal reservoir is located on the hillside east of the city and will require construction of a 7,000-foot pipeline to connect to the city water supply system. Very soft peat deposits were identified along the pipeline alignment, which require extensive stabilization. Geotechnical services provided include field explorations (16 soil borings, three CPTs, and five test pits), geotechnical analysis and recommendations for seismic hazards evaluation, ground improvement, and foundation design/construction, preparation of geotechnical reports, and review and provide inputs to the preparation of plans and specifications.

The Dalles New 2.7 MG Reservoir | The Dalles, OR (2009-2010)

Project manager for a geotechnical investigation in support of the design and construction of a new 2.7-MG steel tank reservoir, pump station, and 1,800-foot-long by 16-foot-wide service road to be constructed on the site at grades (approaching 20 percent). The ridge crest of the reservoir site is narrow and slopes below the site are very steep (up to 100 percent). Careful positioning of the reservoir tank was required to keep the foundation on native materials. The reservoir is located near an ancient landslide area and requires an excavation up to 30 feet deep. We conducted an extensive site geological study/reconnaissance, explorations consisting of 10 deep test pits and five geotechnical borings (approximately 50 to 100 feet deep into bedrock) and laboratory testing of soil samples. The data was used to develop a stable permanent cut slope for the reservoir, evaluate the constructability for rock excavation, conduct the seismic slope stability analysis, foundation design recommendations, and support final design.

MWA
Architects

Jeffrey J. McGraw, AIA *Principal in Charge*

Jeff McGraw has been with MWA Architects since its inception in 1988 and has been the Principal-in-Charge of the Portland office for twelve years. His two decades of experience in industrial and civic design, historic buildings, and municipal master planning have led the Portland MWA team to excellence in design and in project management. Jeff directs MWA's water and wastewater treatment facility projects in Oregon, California, and Washington which frequently include extensive planning efforts, public involvement, process buildings, water quality laboratories, control facilities, administrative, and touring facilities.

Jeff's experience ranges from small pump stations located within residential neighborhoods to large scale new water and wastewater plants within or adjacent to residential communities, all designed with some degree of sustainable benchmarks including LEED. Jeff's recent projects include: Upgrades to the Tri-City Waste Water Treatment Plant, the new Carnation Water Reclamation Plant, the 140' diameter, 200' deep Swan Island Pump Station for Portland's Combined Sewer Overflow project.

Water + Infrastructure

- Principal-in-Charge, Ankeny Pump Station in Tom McCall Waterfront Park, Historic Renovation, Portland, OR
- Principal-in-Charge, Fulton Pump Station in Willamette Park, Portland, OR
- Klineline Pump Station and Gatekeeper Residence at Salmon Creek Park, Vancouver, WA
- Principal-in-Charge, Tacoma Green River Filtration Facility, WA
- Principal-in-Charge, Lake Oswego Water Treatment Plant Expansion, Lake Oswego/Tigard Water Partnership, Lake Oswego, OR
- Principal-in-Charge, Bull Run Supply Treatment Improvements Project, Portland Water Bureau, Portland, OR
- Principal-in-Charge, Chambers Creek Wastewater Treatment Plant, Pierce County Public Works and Utilities, University Place, WA
- Principal-in-Charge, Mountain View Reservoir, City of Oregon City, Oregon City, OR
- Principal-in-Charge, Swan Island Operations & Maintenance Building, City of Portland, OR
- Principal-in-Charge, Emergency Coordination Center, City of Portland, Portland, OR
- Principal-in-Charge, Hawks Prairie Water Reclamation Plant, LOTT Clean Water Alliance, Olympia, WA
- Principal-in-Charge, Carnation Wastewater Treatment Plant, King County, Carnation, WA (LEED Certified)
- Principal-in-Charge, Treatment Plant, Oak Lodge Sanitary District, Oak Lodge, OR
- Principal-in-Charge, Tri-City Water Treatment Plant Expansion, Water Environment Services, Oregon City, OR
- Principal-in-Charge, Wet Weather Facility, Bureau of Environmental Services, Portland, OR
- Design Architect/ Project Manager, Water Treatment Plant, City of Grants Pass, Grants Pass, OR
- Principal-in-Charge, Wastewater Treatment Plant Expansion, City of Crescent City, Crescent City, CA

Education
Bachelor of Architecture, University of Oregon, 1988

Architectural Studies Program, Oregon State University, 1982

Registration
Registered Architect OR , No. 4353
Registered Architect WA, No. 8044

Registered Architect CA, No. C-24100

NCARB, License No. 527888

American Institute of Architects

Honors + Awards
2012 Daily Journal of Commerce First Place Public Buildings More than $50 Million, Tri-City Water Pollution Control Plant Expansion

2010 WateReuse Small Project of the Year. LOTT Clean Water Alliance Hawks Prairie Reclaimed Water Satellite

2010 WateReuse Award of Merit. Richmond Advanced Recycled Expansion (RARE) Water Project

2010 Building of America Gold Medal Award. MUNI Metro East Maintenance Facility

2010 Engineering Excellence Honor Award. MUNI Metro East Maintenance Facility

2009 Best Award – Humboldt Gardens Mixed Use – Portland OR

2009 Best Public works Project – Muni Maintenance Building – San Francisco, CA

2008 WateReuse Association Small Project of the Year – Carnation Wastewater Treatment Plant

2007 AIA SF Excellence in Architecture – Joseph Jensen Filtration Plant Ozonation Building - MWD

2007 Design Excellence Citation Award National Organization of Minority Architects (NOMA) Joseph Jensen Treatment Plant Ozonation Building

2004 Distinguished Projects Winner, American Public Works Association, Sunol Valley Water Treatment Plant Improvements

2003 Honorable Mention, Metal Architecture Design Awards, Central Contra Costa Sanitary District Environmental Laboratory

1999 Award for Excellence in Architecture—Unbuilt Work, National Organization of Minority Architects Sacramento River Intake Structure Review, 1996-1999

- Principal-in-Charge, Robert Diemer Chlorine Facility, Metropolitan Water District of Southern California, Yorba Linda, CA
- Principal-in-Charge, Mills Water Treatment Plant, Oxidation Retrofit Program, Metropolitan Water District of Southern California, Riverside, CA
- Principal-in-Charge, Mills Water Treatment Plant, Chemical Feed and Storage Buildings, Metropolitan Water District of Southern California, Riverside, CA
- Principal-in-Charge, Project Manager, Danville Pump Station, East Bay Municipal Utility District, Danville, CA
- Principal-in-Charge, Mission San Jose Water Treatment Plant Ultrafiltration Building, Alameda County Water District, San Jose, CA
- Principal-in-Charge, Hetch Hetchy Water Treatment Plant - San Francisco, CA
- Principal-in-Charge, Joseph Jensen Filtration Plant Oxidation Retrofit Program, Metropolitan Water District of Southern California Granada Hills, CA
- Principal-in-Charge, Mokelumne River Fish Facility Improvements, East Bay Municipal Utility District, Clements, CA
- Principal-in-Charge, Walnut Creek Aqueduct Maintenance Facility, East Bay Municipal Utility District, Walnut Creek, CA
- Project Architect, Upper San Leandro Ozonation Facility – Upper San Leandro, CA
- Project Architect, Sobrante Ozonation Facility, East Bay Municipal Utility District, Sobrante, CA
- Principal-in-Charge, Water Treatment Plant No. 4, Austin Water, Austin, TX – LEED Services
- Principal-in-Charge, Central Control Facility, Bureau of Environmental Services, Portland, OR
- Project Architect, North Richmond Water Reclamation Plant, East Bay Municipal Utility District, Richmond, CA
- Principal-in-Charge, Regional Reclaimed Water Conveyance Facility Design, King County, WA
- Principal-in-Charge, Watsonville Recycled Water Facility, Pajaro Valley Water Management Agency, Watsonville, CA
- Lake Oswego Water Treatment Plant Program Management, Lake Oswego/Tigard Water Partnership, Lake Oswego, OR
- Bull Run Supply Treatment Improvements Project, Portland Water Bureau, Portland, OR
- BPA McNary Office, Maintenance and Storage Facilities, Umatilla, Oregon
- West Point Office Annex, Seattle, WA

Kay Kinyon
12683 NE Cedarbrook Rd.
Aurora, Oregon
Email: kayk@tclu.com Phone: 503-803-7594

Experience

Tree Care LLC — August 2005 to Present
- Consulting Arborist

City of Lake Oswego — September 1975 to June 2004
- Parks Superintendent

Education

University of Oregon — October 1971 to June 1973
Southern Oregon College — January 1970 to June 1971

Skills

Landscape and facilities management
International Society of Arboriculture Certified Arborist No. PN0409A
International Society of Arboriculture Certified Tree Risk Assessor No. 597

ENVIRON

Kristen L. Wallace | Senior Manager

Lynnwood, Washington
+ 1 425 412 1807 | kwallace@environcorp.com

Kristen Wallace has more than 17 years of experience managing and conducting environmental noise studies. These studies have included compliance determinations, impact assessments and investigations of mitigation measures for a variety of proposed developments and actions for private developers and government agencies. The results of these analyses have been included in documentation ranging from simple compliance assessment reports and SEPA checklists to SEPA/NEPA environmental impact statements and environmental assessments.

EDUCATION

1992 MS, Aerospace Engineering, University of Cincinnati

1988 BA, Mathematics and History, College of Idaho

EXPERIENCE

Major Public Projects

- Thurston County Accountability and Restitution Center (ARC) and Courts Facility, Shockey/Brent, Inc. and Thurston County, Olympia and Tumwater, WA. Project Manager for Air Quality and Noise Assessments and Primary Analyst for Noise Assessment. Analyzed the noise impacts of this proposed facility in Thurston County, Washington and coordinated the air quality analysis for the project. Documented the results of the noise assessment for inclusion in the EIS for the project.
- Southwest Recycling and Transfer Station (SWRTS), Snohomish County, Mountlake Terrace, WA. Noise Mitigation Analyst. Participated in analysis of potential means to reduce noise from operation of Snohomish County's Southwest Recycling and Transfer Station received at nearby off-site locations. Performed field measurements and conducted a modeling analysis using Cadna/A to assess the potential effectiveness of noise mitigation. Assessed costs for varying combinations of noise mitigation.
- Brightwater Conveyance Project, MWH-Jacobs Associates Joint Venture, Tetra Tech, Inc., and King County, Cities of Bothell and Kenmore and Snohomish County, WA. Primary Noise Analyst. Analyzed the noise impacts associated with construction and tunneling activities related to the Brightwater Conveyance Project proposed for portals in the City of Bothell, the City of Kenmore, and unincorporated Snohomish County. The analysis of each portal comprised sound level measurements, modeling the construction sound levels at nearby sensitive receivers using Cadna/A, and assessing the potential for noise impacts from the proposed activities. Each effort involved coordination with many team members including various consultants, the cities, and King and Snohomish counties.
- Off-Road Vehicle (ORV) Noise Mitigation Policy Study, Washington Interagency Committee (IAC) for Outdoor Recreation, WA. Assisted in the review and development of a proposed model ordinance to reduce impacts from ORV noise received in residential properties around the state. Research effort included literature reviews and interviews of potentially affected stakeholders. Model ordinance development included proposed amendments to the existing state noise rules (WAC 173-60 and others) to provide a tool with which local jurisdictions can control ORV noise. Study and proposed model ordinance were reported in a document submitted to the IAC.
- Bow Lake Recycling and Transfer Station Renovation, R.W. Beck, Inc., and King County, Tukwila, WA. Primary Noise Analyst. Assessed potential noise impacts due to the upgrade and expansion of the existing Bow Lake solid waste transfer station. Analyzed noise impacts based on sound received at nearby residences across Interstate 5

on a hillside overlooking the facility and at an adjacent undeveloped parcel planned for residential development. The noise analysis was included as part of the SEPA Environmental Checklist for the proposed expansion.

- Sand Point Magnuson Park Wetland/Habitat Complex and Sports Fields Project, Huckell/Weinman Associates, Inc. and Seattle Department of Parks and Recreation, Seattle, WA. Primary Noise Analyst. Evaluated the potential noise impacts from the proposed athletic fields and related activities to neighbors of Sand Point/Magnuson Park for the project Final Environmental Impact Statement (FEIS). Subsequently assisted in the evaluation of noise impacts to adjacent wildlife habitat areas for an addendum to the EIS. Results of the evaluations were included in a final EIS and an addendum to the EIS for the project. Provided testimony on noise issues at hearings for appeals regarding the adequacy of the FEIS and the Supplemental EIS.
- Everett Sports Arena, Shockey/Brent, Inc., and City of Everett, Everett, WA. Project Manager for Air Quality and Noise Assessments and Primary Analyst for Noise Assessment. Managed the air quality and noise analyses for the Everett Arena, proposed to be constructed in Everett's downtown business district. The arena would be used for hockey games and community events. Conducted the noise impact assessment and documented the results of the air quality and noise analyses in brief reports presented to the City.
- Snohomish County Redevelopment Initiative, Shockey/Brent, Inc., and Snohomish County, Everett, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Managed the air quality and noise analyses for the proposed Snohomish County Campus Redevelopment Initiative (CRI). The CRI would involve redeveloping the existing county campus, including several county buildings and the county jail on a site near the downtown business district. The air quality analysis focused on potential impacts related to increased traffic volumes and idling times at signalized intersections in the project vicinity. Conducted the noise impact assessment and documented the results of the air quality and noise analyses in brief reports presented to the City.
- Cedar Water Treatment Facility, R.W. Beck & Associates, Inc., and Seattle Public Utilities, King County, WA. Primary Noise Analyst. Conducted a noise analysis for a new water treatment facility for the City of Seattle. The noise sources anticipated for use on the site included ozone-generating equipment, water pumps, and trucks unloading chemicals. Measured the existing sound levels at representative locations in the community and modeled the project-related sound levels at numerous nearby residences. The results of the noise impact analysis were included in a SEPA EIS.
- Auburn Corrosion Control Water Towers, Economic & Engineering Services, Inc., and the City of Auburn, Auburn, WA. Primary Noise Analyst. Analyzed the potential environmental noise impacts of two corrosion control water treatment facilities within the City of Auburn. Each treatment facility was designed to house a generator, clearwell pumps, and stripping air blowers inside a concrete building, with several carbon monoxide (CO) stripping towers outside the building. Calculated the sound levels of the facilities at nearby residences and documented the results of the analyses in technical reports presented to the City.
- Lodi Power Plant, URS Corporation, Lodi, CA. Primary Noise Analyst. Analyzed the environmental noise implications of a proposed 47-megawatt (MW) simple-cycle peaking plant to be located in Lodi, California. Measured existing sound levels in the community, modeled sound levels of the plant at the nearest residences, and suggested mitigation measures to reduce noise from the plant at several residential receivers. Results of the study were presented in a report delivered to the City of Lodi, the ultimate owners of the project.

Road/Highway Projects

- SR522 Improvements Project, Bucher, Willis & Ratliff Corporation and the City of Kenmore, Kenmore, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Managed the air quality and noise analyses for the City of Kenmore's proposed highway improvements as part of a NEPA/SEPA environmental process. The project included roadway improvements, a substantial realignment of a portion of the highway, and intersection modifications. For the noise analysis, used the Traffic Noise Model (TNM) to estimate traffic noise levels at sensitive receivers near the proposed roadway realignment and to analyze noise barriers for their effectiveness and cost. The results of the air quality and noise analyses were documented in technical reports suitable for review by the Washington State Department of Transportation (WSDOT) and subsequent attachment to an Environmental Assessment (EA).

- Cross-Base Highway EIS, Parametrix, Inc., and Pierce County, Pierce County, WA. Project Manager for Air Quality and Noise Assessments and Senior Technical Lead for Noise Assessment. Managed the air quality and noise analyses for a proposed major east-west highway in Pierce County, Washington, as part of the NEPA/SEPA environmental evaluation. Oversaw the TNM modeling effort used to estimate traffic noise levels for three alternative alignments of the proposed roadway through two residential communities and to analyze the effectiveness of noise barriers. The results of the air quality and noise assessments were documented in technical reports suitable for review by WSDOT and subsequent attachment to an EIS.
- SR104: US101 to Kingston Ferry, Sverdrup Civil, Inc., and WSDOT, Jefferson and Kitsap Counties, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Managed the noise and air quality analyses for the SR-104 improvement project from SR-101 to the Kingston Ferry. The project corridor included five segments, each of which was treated separately and included several build alternatives. The project was experimental both in its approach to the design of the project alternatives and the EIS process. The design, public involvement, and environmental documentation were implemented simultaneously in an attempt to speed the process. The impact analyses were therefore somewhat qualitative because it was expected to take approximately 20 years before the project was budgeted and built, and the discussions were primarily theoretical. Results of both the air quality and noise analyses were included in technical reports/EIS sections reviewed by WSDOT and the public entities involved in the design process.
- SR-18/C Street On/Off Ramps, Earth Tech, Inc., and the City of Auburn, Auburn, WA. Primary Noise Analyst. Evaluated the potential noise impacts associated with reconfiguration of the westbound on- and off-ramps of SR-18 at C Street in Auburn, Washington. Measured existing traffic sound levels, modeled future traffic sound levels, and assessed potential noise mitigation measures. In a follow-up to the original analysis, reexamined the noise implications of a revised form of this interchange and related surface street modifications. The results were included in a supplemental environmental review of the project.
- Elliott Bridge Replacement, Herrera Environmental Consultants and King County Roads Division, King County, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Conducted the environmental noise analysis and oversaw the air quality analysis of the Elliott Bridge Replacement Project in unincorporated King County. Analyzed four potential alternatives, including different bridge and roadway alignments, and estimated traffic noise levels for the no build and four build alternatives in the design year. Results were reported in the EIS for the project.

Transit Projects

- Sound Transit Tacoma-to-Lakewood Commuter Rail Project (D to M Street), Herrera Environmental Consultants, Tacoma, WA. Noise Analyst. Conducted and coordinated noise impact and air quality assessments for a new section of the Sound Transit Commuter Rail line, between Tacoma and Lakewood. Several alternative alignments were considered. For the noise impact assessment, measured 24-hour background sound level measurements at multiple locations, modeled sound levels for each alternative commuter rail route and for wayside horn noise at rail/road crossings using Cadna/A, modeled sound levels for realigned roadways in the project vicinity using the Traffic Noise Model (TNM), and assessed noise impacts using Federal Transit Administration noise impact criteria. Assisted in the preparation of relevant sections of SEPA Environmental Impact Statement (EIS) and NEPA Environmental Assessment (EA).

Kristen L. Wallace

- North Snohomish County Park & Ride Siting Studies, OTAK, Inc. and Community Transit, Arlington and Marysville, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Conducted the noise impact assessments and oversaw the air quality assessments for two proposed park & ride lots being considered for north Snohomish County. Documented the results of the noise studies for both sites in brief technical reports suitable for attachment to the environmental documentation.
- Redmond Transit Center Expansion Project, Camp Dresser McKee and King County Metro, Redmond, WA. Senior Technical Noise Review. Provided technical guidance and documentation review for the noise analysis conducted for Redmond Transit Center Expansion Project. The project would replace the existing transit center loop and layover area with a larger system on the same site, which would accommodate a greater number of buses by providing additional lanes with a larger layover capacity. The noise study was documented in a technical report suitable for use by King County Metro.
- Issaquah Transit Center Expansion Project, KPFF Consulting Engineers and Sound Transit, Issaquah, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Conducted the noise study and oversaw the air quality study for the proposed expansion of the Issaquah Transit Center and Park & Ride Expansion Project. The proposed project would add transit center facilities to the western portion of the existing site and would add an 800-vehicle parking structure to the southern portion of the site. The noise analysis relied on FTA procedures and criteria to assess potential noise impacts from the project. The air quality assessment consisted of hot-spot air quality modeling of CO concentrations at potentially affected signalized intersections. Results of both the air quality and noise analyses were documented in technical reports suitable for review by Sound Transit, the City of Issaquah, and WSDOT.
- Mountlake Terrace Park & Ride Expansion Project, Otak, Inc., and Community Transit, Mountlake Terrace, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Conducted the noise study and oversaw the air quality study for the proposal to expand the Mountlake Terrace Park & Ride. The expansion project would consist of constructing a new parking garage structure on the existing Mountlake Park & Ride site. The proposal would expand the number of parking spaces at the existing park-and-ride from 390 to 880 spaces. The noise analysis relied on FTA procedures and criteria to assess potential noise impacts from both the expanded park-and-ride and from increased traffic on access roads to the site. The air quality assessment consisted of microscale hot-spot air quality modeling of CO concentrations at potentially affected signalized intersections, and modeling results were compared with federal and state ambient air quality standards. Results of the air quality and noise analyses were documented in technical reports suitable for attachment to the SEPA environmental documentation.
- South Everett Transit Project, Entranco Engineers, Inc., and Sound Transit, Everett, WA. Project Manager for Air Quality and Noise Assessments and Senior Technical Lead for Noise Assessment. Managed the air quality and noise analyses for Sound Transit's proposed park-and-ride with fly-by access as part of a NEPA/SEPA environmental review process. The project was proposed to be located between the northbound and southbound lanes of Interstate-5 in South Everett. Conducted noise analysis and used Traffic Noise Model (TNM) to estimate traffic noise levels at sensitive receivers near the proposed park-and-ride. Identified traffic noise impacts and analyzed effectiveness and cost of noise barriers. Oversaw air quality analysis consisting of CAL3QHC modeling of affected intersections near the project site. The results of the air quality and noise analyses were documented in a technical report suitable for review by WSDOT and subsequent attachment to an EIS.
- Lynnwood RTA Projects, Inca Engineers, Inc., and Sound Transit, Lynnwood, WA. Noise Analyst. Evaluated the environmental noise impacts of the proposed high-occupancy vehicle (HOV) access connection and transit center expansion and relocation project considered by Sound Transit and Snohomish County for the existing Lynnwood park-and-ride. The alternative configurations considered included HOV ramps directly from the facility to I-5, and several variations of the facility layout on an expanded site. The environmental noise impact analysis included

day-long measurements at several residential use locations near the project site, followed by calculations to assess potential impacts in relation to FTA guidelines. Results of the noise analysis were reported in a technical report attached to the SEPA/NEPA EIS for the project.

- Portland Airport LRT, TW Environmental, Inc., and Tri-Met, Portland, OR. Primary Noise Analyst. Examined the environmental noise implications of extending the Portland light rail system to the Portland Airport. Calculated project-related sound levels based on Federal Transit Administration (FTA) methods and assessed potential noise impacts based on FTA criteria in close coordination with Tri-Met, the Portland transit agency. Results of the measurements and analysis were reported in a technical report that was summarized in the EIS for the project.

Miscellaneous Facilities/Developments

- Integrated Gasification Combined Cycle Generating Station, URS and Energy Northwest, Cowlitz County, WA. Primary Noise Analyst. Conducted the noise analysis and mitigation assessment for a proposed 600-megawatt electricity-generating plant on an 80-acre industrial site in Cowlitz County, on the Columbia River just north of Kalama, Washington. The plant would use an integrated gasification combined cycle (IGCC) process that turns coal (or petroleum coke) into a gas and then burns the gas to generate electric power. Noise assessment involved measuring existing noise levels and modeling expected noise from the facility using the Cadna/A noise model. The complex noise assessment included noise from three separate processes within the facility: material transport by train, the coal gasification process, and the power generation process. Based on the results of noise assessment, developed noise mitigation alternatives focused on modification to power generation equipment. Results of the noise analysis were included in the permit application submitted to the Washington Energy Facility Site Evaluation Council and were included in the EIS for the project.
- Pier 1 Redevelopment Project, Port of Anacortes, Anacortes, WA. Primary Noise Analyst. Conducted the environmental noise impact and mitigation analysis for the proposed expansion of this shipyard facility. The noise assessment included measurements of existing ambient sound levels in the potentially affected area, source noise measurements for equipment and processes in use at the existing facility, and noise modeling of potential impacts and mitigation measures.
- Port of Everett Satellite Rail/Barge Intermodal Facility, Berger/ABAM Engineers, Everett, WA. Noise Analyst. Participated in the assessment of environmental noise impacts related to the development of a rail/barge transfer facility at the Port of Everett as input to the EIS and permitting process. The proposed facility would allow offloading of oversized shipping containers from barges to railcars for transport to an aerospace manufacturing plant.
- Burlington Lumber Manufacturing Plant and Cogeneration Facility, Sierra Pacific Industries, Skagit County, WA. Primary Noise Analyst. Conducted the noise analysis of a proposed lumber-manufacturing facility and cogeneration plant to be located in an industrial park in Skagit County, Washington, near the town of Burlington. The noise analysis consisted of predictions of future facility-related sound levels at nearby residential locations and comparison of the projected levels with the appropriate noise standards. Results of the noise analysis were documented in a brief letter report presented to the client and in responses to the SEPA checklist noise questions.
- Church of Living Water Noise Issues, Church of Living Water, Thurston County, WA. Provided a response to several noise issues raised as part of an appeal of the SEPA Mitigated Determination of Non-Significance (MDNS) for the Church of Living Water project in Olympia, Washington. Noise sources associated with the proposed church included traffic on local access roads, parking lots, HVAC and mechanical equipment, interior amplified events, and exterior festivals. Subsequent to review of the appeal documents, conducted a noise mitigation assessment for the project, which led the County to issue a revised MDNS.
- Law Enforcement Firearms Practice Range, City of Sequim, Sequim, WA. Primary Noise Analyst. Conducted a noise assessment for the proposed reestablishment of a firearms practice range. The facility would be located on

a vacant portion of Sequim's Water Reclamation Facility site. Considered potential future sound levels at several residences in the general vicinity using the Cadna/A noise model. Assessed potential noise reductions provided by walls, berms, and a rooftop structure as part of the modeling effort. Documented the results of the noise analysis in a brief letter report to the City of Sequim and in answers to the Noise questions in the SEPA checklist.

- Northshore School District Transportation & Maintenance Facility and City of Bothell Public Works Facility, Northshore School District, Bothell, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Evaluated the noise implications of relocating a school bus storage and maintenance facility from its existing location in Bothell to a new site. As part of the noise analysis, measured the existing sound levels representative of potentially affected residences in the project vicinity. Evaluated noise from buses starting, performing safety checks, and exiting the site in the morning; vehicle maintenance activities; parking lot noise; and the Bothell Public Works vehicles and activities. Results of the assessment were documented in a noise report presented to the School District.
- Edmonds School District Support Services Facility, Integrus Architecture and Edmonds School District, Lynnwood, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Considered potential noise impacts at locations near the proposed project site from noise sources associated with the facility, including on- and off-site vehicles, maintenance activities, and HVAC units. Documented the results of the noise impact assessment in a brief letter report attached to the SEPA checklist for the project.
- Canyon Park Junior High School Athletic Field Improvements, Northshore School District, Bothell, WA. Primary Noise Analyst. Assessed the potential noise impacts associated with the expanded use and operating hours of an existing athletic field at the Canyon Park Junior High School. Proposed changes include lighting the field for nighttime play and replacing the natural grass with artificial turf, which is expected to increase both the operating hours and seasonal use of the field.
- Desert Claim Wind Power Project, Huckell/Weinman Associates, Inc., and Kittitas County, Kittitas County, WA. Primary Noise Analyst. Conducted the noise analysis of a large wind power project proposed to be located near Ellensburg in Washington. Measured week-long sound levels to describe the existing ambient sound environment. The measured sound levels were correlated to measured wind speeds taken at nearby meteorological tower sites to determine the influence of wind on the ambient sound levels. The modeled sound levels of the wind turbines affecting nearby residential receivers were compared to both the applicable noise limits and to the measured ambient sound levels to determine potential noise impacts from the project. Results of the analysis were documented in the Noise section of the EIS for the project.
- Cypress Island Fish Farm Expansion, Davis Wright Tremain, Bainbridge Island, WA. Primary Noise Analyst. Assessed the potential noise impacts of proposed improvements to the Cypress Islands Fish Farm located in the City of Bainbridge Island. The proposed improvements included construction of large barges at the farm to house fish feed, employment facilities, and the generator. As part of the assessment, measured sound levels of the existing facility, including automatic fish feeders, compressors, and a generator. The measured sound levels were found to easily comply with the daytime noise limits, and the proposed improvements were expected to reduce the sound levels and bring the nighttime noise into compliance with the limits. Results of the analysis were documented in a brief letter report presented to the client.
- Sumas Energy, National Energy Systems Company, Sumas, WA. Primary Noise Analyst. Evaluated the environmental noise implications of a proposed 660 MW combined cycle electrical generating project in Sumas, Washington. Modeled sound levels from the proposed plant and identified several noise mitigation measures. Assisted in preparing evidence for presentation to the Washington Energy Facility Site Evaluation Council and to the Canadian National Energy Board.

Kristen L. Wallace

- Plymouth Generating Facility. National Energy Systems Company (NESCO), Benton County, WA. Primary Noise Analyst. Analyzed the environmental noise implications of a proposed combined cycle power generation facility to be located in Benton County, Washington near the town of Plymouth. Modeled sound levels of the proposed plant at property line and nearby residential locations and recommended mitigation measures to reduce noise from the plant at several nearby receivers. Results of the study were included in an EIS.
- Des Moines Conveyor EIS, Adolfson Associates, Inc., and City of Des Moines, Des Moines, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Conducted the noise analysis and oversaw the air quality analysis of a proposed conveyor designed to be used to transport fill material to SeaTac International Airport for use in construction of the third runway and other facility improvements. As part of the analysis, modeled sound levels of the equipment at nearby residences. Results of the analysis were documented in a report to be attached to an EIS. Subsequently responded to public comments on the EIS and assisted in the completion of the FEIS.
- Whidbey Island NAS DTR Siting EA, Maker's Architecture and Urban Design and U.S. Navy, Whidbey Island, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Conducted the noise analysis and oversaw the air quality analysis for the siting of a detonation training range (DTR) at the Seaplane Base on Whidbey Island Naval Air Station (NASWI). Two potential DTR sites were studied. The DTR would be used by the Explosive Ordnance Detonation Mobile Unit (EODMU) ELEVEN unit at the naval air station. In addition to the relocation of the existing range, EODMU requested an increase in the amount of explosive material allowed per detonation from 0.5 pound to 5 pounds. The noise analysis included measurements of the existing sound environment in the vicinity of Whidbey Island NAS as well as source sound level measurements of a test explosion taken at Ft. Lewis, Washington, with cooperation of the U.S. Army. Using the source sound levels, noise modeling was conducted for potentially affected residences near the sites. Because the initial modeling found the potential for impacts to be high, noise mitigation measures were analyzed. It was found that certain amounts of explosive could be detonated only when the nearest residences were upwind from the detonation site. The results of both the noise and air quality analyses were documented for inclusion in an EA.
- Immunex Headquarters EIS, URS Consultants, Inc., Immunex Corporation, City of Seattle, Seattle, WA. Primary Noise Analyst. Conducted a two-part noise analysis for a development project proposed by the Immunex Corporation and the City of Seattle. The first part of the analysis concentrated on the construction and operation of a corporate headquarters and research and development campus on the Seattle waterfront. The second part of the analysis assessed the potential noise impacts associated with the Public Transportation Improvement Project, which comprised several transportation access improvement alternatives designed to improve general traffic circulation in the Elliott Avenue/Galer Street vicinity. The environmental noise impact analysis was included in an EIS.

Mineral Extraction/Processing Facilities

- Sande Sand & Gravel, Sande Sand & Gravel LLC, Snohomish County, WA. Primary Noise Analyst. Conducted a noise impact assessment of a proposed sand and gravel pit near Stanwood, Washington for a Conditional Use Permit (CUP). Calculated sound levels of mining and transport equipment at several property line locations. As a result of the analysis, recommended noise mitigation including a berm or barrier around a portion of the mining boundary. Results of the noise impact analysis were documented in a report presented to the client.
- Lakeside Asphalt Plant EIS, Lakeside Industries, Inc., Brush Prairie, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Managed the air quality and noise analyses of a hot-mix asphalt batch plant proposed to be located on an undeveloped property in Brush Prairie, Washington. For the noise analysis, modeled sound levels of facility-related equipment at neighboring properties. Assessed the potential for significant noise impacts based on both the compliance of the predicted project-related levels with the local noise limits and the projected increases in overall noise levels with the proposed facility. Documented results of the

analysis in a technical report suitable for attachment to the EIS. Provided expert witness testimony on noise issues at a hearing on the appeal of the adequacy of the EIS.

- Pasco Pit Asphalt Plant, Central Pre-Mix Concrete Company, Pasco, WA. Primary Noise Analyst. Investigated the potential noise impacts associated with installing a hot-mix asphalt plant in an existing sand and gravel mine in Pasco, Washington. The noise analysis included measuring the existing sound levels in the project vicinity and modeling potential future sound levels due to the asphalt plant and associated equipment. These existing and modeled sound levels were added together to assess the potential cumulative effects of the proposal. Documented the results of the noise study in a technical report suitable for presentation to the City of Pasco. The report was included as an attachment to the EIS for the project.
- Abston Pit, Abston Henricksen Properties, LLC, Pierce County, WA. Project Manager for Air Quality and Noise Assessments and Primary Noise Analyst. Managed the air quality analysis and was primary investigator for the noise analysis for a small proposed gravel pit in rural Pierce County, Washington. The air quality analysis was qualitative and focused on potential impacts from particulate matter (i.e., dust). The noise analysis included measurements of existing sound levels, modeling predictions of future sound levels during several phases of the pit, and an assessment of the effectiveness of berms for noise reduction. Results of both studies were provided in brief technical reports.
- Maury Island Gravel Mine EIS, Glacier Northwest, Inc., King County, WA. Primary Noise Analyst. Conducted a noise analysis for the expansion of an existing sand and gravel pit on Maury Island, Washington. As part of the analysis, modeled future sound levels and suggested noise mitigation measures. The noise technical report was attached to an expanded SEPA checklist. Subsequently assisted in responding to public comments on the Maury Island Gravel Mine EIS, assessed the noise impacts of extending the length of the loading pier for a supplemental EIS, and provided testimony to the Shoreline Hearings Board regarding environmental noise issues.
- North Bend Gravel Operation EIS Review and Supplemental Analysis, URS Consultants, Inc., and King County DDES, King County, WA. Primary Noise Analyst. Asked by King County and URS to provide a third-party review of the noise analysis included in the DEIS and FEIS for the proposed North Bend Gravel Operation near North Bend, Washington. Subsequently conducted a supplemental noise analysis, which included additional sound level measurements, updated noise modeling of on-site noise sources, updated modeling of off-site truck traffic, and completion of a new noise section for an addendum to the EIS. Subsequent to the publishing of the EIS Addendum, Ms. Wallace provided assistance to King County's prosecuting attorney in responding to a challenge to the County's approval of a grading permit for the operation.
- Riverscene Resources DNR Expansion, Riverscene Resources, Snohomish County, WA. Primary Noise Analyst. The client was proposing to mine a piece of property owned by the Department of Natural Resources (DNR) adjacent to the existing Riverscene Resources mine. For the noise analysis, measured existing sound levels at neighboring properties, modeled sound levels of excavation activities and trucks in the expansion area, and added this to the noise from activities at the Riverscene Resources mine to assess potential compliance with the Snohomish County noise limits. Results of the analysis were documented in a letter for presentation to the County.
- Snoqualmie Hard Rock SEPA Checklist, Huckell/Weinman Associates, Inc., and Glacier Northwest, Inc., King County, WA. Primary Noise Analyst. Conducted the environmental noise analysis and oversaw the air quality analysis for the expansion of existing operations at the Glacier Northwest Snoqualmie Sand and Gravel Pit to include hard rock mining. The proposed action would add drilling, blasting, and rock screening to the existing crushing, screening, batch processing, and hauling. The results of both the air quality and noise studies were included in an expanded SEPA checklist. Provided testimony on noise issues at the permit hearing. Subsequently developed and implemented a noise monitoring plan in response to a condition imposed on the permit.

Kristen L. Wallace

- Palmer Junction Gravel Pit EIS, R.W. Beck & Associates, Inc., and King County DDES, King County, WA. Primary Noise Analyst. Conducted the noise impact analysis of an expansion of an existing sand and gravel extraction facility located in rural King County, Washington. Of particular concern were unique topographic and meteorological conditions in the vicinity of the project. As part of the noise analysis, completed extensive sound level measurements to fully characterize existing sound levels at nearby residences. The results of the noise analysis were documented in a technical report suitable for attachment to the EIS. After completion of the EIS, developed noise mitigation and monitoring plans to be used by King County to ensure the facility met nighttime sound level limits during asphalt production.
- Davis Sand & Gravel Pit CUP, Davis Sand & Gravel, Clallam County, WA. Primary Noise Analyst. Analyzed the environmental noise implications and oversaw the air quality study related to the expansion of a sand and gravel pit operated near Sequim, Washington. Modeled sound levels of the facility equipment at nearby residential receivers. Results of the analysis were included in a document to support approval of a Conditional Use Permit. Subsequently provided expert testimony on noise issues at the permit hearing.
- Randles Sand & Gravel Pit Expansion, Randles Sand and Gravel, Thurston County, WA. Noise Analyst. Conducted the noise impact analysis for the expansion of an existing sand and gravel extraction facility located in rural Thurston County, Washington. Modeled future sound levels, identified potential noise impacts, and evaluated various mitigation techniques. The results of the noise analysis were documented in a technical report suitable for attachment to an EIS.

CREDENTIALS

Professional Affiliations and Activities

Member, Institute of Noise Control Engineering

Degenkolb

Donald B. Ballantyne

Principal

Don Ballantyne has particular expertise in -hazard risk management of infrastructure systems. He has evaluated and/or designed upgrades for over 70 systems in the U.S. He has designed pipelines, pump stations, and treatment plants, and has a broad-based understanding of system operation requirements.

He has studied the water distribution systems for the cities such as Seattle and Portland, considering the pipe materials, pipe embedment, pipe failures, and the damage mechanisms leading to those failures. He was the resident engineer for the installation of 80 miles of pipe, and early in his career, worked locating pipe breaks in water distribution systems. He has conducted several pipeline research projects funded by the American Water Works Research Foundation including one addressing the economic impacts of internal corrosion, and a second on performance of the Seattle water system in the 2001 Nisqually Earthquake.

Education

B.S. Civil Engineering
Rensselaer Polytechnic Institute, 1974

M.S. Civil/Sanitary Engineering
SUNY at Buffalo, 1977

Registration

California — Civil Engineer
License No. 34088

New York — Civil Engineer
License No. 056494-1

Oregon — Civil Engineer
License No. 18322PE

Washington — Civil Engineer
License No. 23237

Professional Affiliations

American Water Works Association: Member, 1982

American Society of Civil Engineers : Past Chair, Technical Council on Lifeline Earthquake Engineering

Earthquake Engineering Research Institute: Past Director; Past Member Spectra Editorial Board

Professional History

Degenkolb Engineers, San Francisco, CA and Tacoma WA, Principal, 2011 to present

MMI Engineering, Federal Way, WA, Senior Consultant, October 2007 to 2011

EQE International Consulting/ABS Consulting, Seattle, Washington, VP/Director, 1995 - 2007

Dames & Moore, Seattle, Washington, Associate, 1994-1995

Kennedy/Jenks, Federal Way, WA & San Francisco, CA, Senior Consultant, 1980-1994

EQSI, Rockville, Maryland, Project Engineer, 1979-1980

E.R. Cotton Associates, Gowanda, New York, Project Engineer, 1974-1979

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San Francisco, California 94104-4207
415 392.6952 *phone*
554.0782 *fax*
www.degenkolb.com

Degenkolb

Donald B. Ballantyne

Relevant Experience

City of Los Angeles, Independent Review of Material Section for Water Mains
Los Angeles, California

Reported for the Board of water and Power Commissioners, City of Los Angeles, Department of Water and Power. Provided comparison of pipeline seismic performance of pipeline systems/materials for LADWP's pipeline replacement program.

Seismic Vulnerability Assessment of Water and Sewage Facilities
City of Lake Oswego, Oregon

Evaluated water treatment plant and Tryon Creek wastewater treatment plant, pump stations, pipelines and water reservoir. Prioritized system component vulnerability and criticality.

City of Portland Water Bureau, Multi-Hazard System Vulnerability Assessment
Portland, Oregon

Quantified the risk to their water system for a wide range of hazards including earthquake, intense storm, and terrorism. The project included hazard quantification, assessment of the vulnerability of the system and system components, and identification of the consequences of to the system. Focused on the system backbone including the watershed, dams and reservoirs, 85 miles of large diameter conduits, terminal reservoirs, and selected distribution pump stations and tanks.

Water System Seismic Vulnerability Assessment
Oregon City, Oregon/West-Yost

Conducted seismic assessment quantifying shaking and liquefaction hazards for operating- and design-basis earthquakes. Evaluated reservoirs, pump stations, and PRV vaults. Estimated likely performance of system pipelines. Summarized expected performance for the 2 levels of earthquakes, and recommended short, medium, and long-term improvements.

Portland Bureau of Waterworks, Groundwater Pump Station Improvements
Portland, Oregon

Evaluated and designed seismic upgrades for 2 MG tank and large diameter site piping. The Groundwater Pump Station relies on a 2 MG reservoir to collect groundwater, and provide water for suction on the 100 MGD pump station. The steel reservoir is on liquefiable soil, and is potentially vulnerable to earthquake ground motion. Developed 5 upgrade alternatives. Looked at upgrading the existing reservoir, moving the reservoir to an alternate site to allow ground improvement, raising the reservoir, and constructing one of several new reservoir alternatives.

Degenkolb

Donald B. Ballantyne

Relevant Experience

WRF and Seattle Public Utilities, Performance of Water Supply Systems during 2001 Nisqually Earthquake

Various Locations

Developed mitigation strategies to mitigate the effects of pipeline damage following earthquakes, documented "lessons learned" in the Nisqually Earthquake, and documented pipeline damage data from the isqually Earthquake, and other Puget Sound earthquakes that have impacted Puget Sound area water systems.

Washington Wastewater System, Seismic Risk Assessment of the King County

Seattle, Washington

The system is the regional wholesale wastewater collection and treatment agency serving Seattle and the surrounding cities. The project evaluated the risk of all pipeline segments submerged, buried under water, or founded in liquefiable soils for three levels of earthquake hazards. The vulnerability due to wave propagation and permanent ground deformation addressed. The consequence of failure was considered taking into account approximately 20 parameters. The sewers were ranked by risk to focus a detailed evaluation. Schematic mitigation solutions were prepared for selected sewers.

Clearview Consortium, Clearview Pipeline Project

Snohomish County, Washington

Seismic consultant to project team with the following responsibilities: recommended seismic design criteria for pipeline, reservoir and pump station, pipeline material and joint design for seismic resistance, equipment and piping anchorage and bracing in the pump stations, and reservoir connections.

Portland Water Bureau, Design, Inspection & Maintenance of Water Pipes Installations on Host Bridges

Portland, Oregon

Prepared report sections on pipe material, restraint, and flexibility required for seismic performance. Developed discussion on prioritization of needs/risk assessment based on function of line on bridge within the overall system.

River Crossing Seismic Assessment

Richmond, British Columbia

Evaluated the seismic vulnerability of three Fraser River pipeline crossings, considering the expected permanent ground deformation and the ability of the pipelines to accommodate the expected movement. Also identified mitigation strategies to provide water following earthquakes.

City of San Francisco/Olivia Chen Consultants, Earthquake Vulnerability Assessment of San Francisco Zoo Infrastructure Design

San Francisco, California

Quantified earthquake hazards including shaking and liquefaction/lateral spread primarily from the San Andreas Fault. Recommended three seismic resistant material/design systems for pressure piping. Evaluated sewers vulnerability and recommended approaches to mitigate flotation and lateral movement.

*Relevant Experience Projects listed above have been performed with firms other than Degenkolb Engineers.

Degenkolb

Donald B. Ballantyne

Relevant Experience

Publications and Presentations

Ballantyne, Donald (2012) "Pipeline damage Mechanisms and Material Selection in an Earthquake Environment", Presentation to the Water Research Foundation Workshop, Los Angeles, California, March.

Ballantyne, Donald (2010), "Seismic Assessment and Design of Pipelines" Webinar, ASCE Continuing Education Program, May.

Ballantyne, Donald (2010) "Seismic Vulnerability Assessment and Design of Pipelines", Journal of the American Water Works Association, Denver, Colorado, May

Ballantyne, Donald (2005) "Earthquake Impacts on Pipelines, Analysis, and Mitigation Approaches", Presented at the Pacific Northwest Section of the American Water Works Association Annual Conference, May.

Ballantyne, Donald and William Heubach (2003), "Comparison of Mitigation Alternatives for Water Distribution Pipelines Installed in Liquefiable Soils", Advancing Mitigation Technologies and Disaster Response for Lifeline Systems, Proceedings of the Sixth US Conference and Workshop on Lifeline Earthquake Engineering, James Beavers, Editor, August.

Ballantyne, Donald (2000) "Use of Geotechnical Information for Pipeline System Analysis" Lifeline Geotechnical Engineering, Proceedings of the 14th Annual Vancouver Geotechnical Society Symposium, Vancouver BC, May 26.

Ballantyne, Donald (1997) "Seismic Vulnerability Assessment and Design of Water Pipelines in the United States" Proceedings of the 4th International Symposium on Water Pipe Systems, Kobe Japan, November.

Ballantyne, Donald (1995) "Relative Earthquake Vulnerability of Water Pipe", Proceedings of the American Water Works Association Annual Conference, Anaheim, California, AWWA, Denver, Colorado, June.

Pelz, Zach

From: Day, Eric [eday@ci.oswego.or.us]
Sent: Thursday, October 25, 2012 11:59 AM
To: Pelz, Zach
Cc: Carrie Richter; Eric Eisemann
Subject: Fwd: LOTWP team resumes
Attachments: LOTWP team resumes.pdf; ATT00001.htm

Zach,

Attached is a list of our experts resumes for the record.

Thanks,

Eric Day

Sent from my iPad

Begin forwarded message:

> **From:** "Rose, Deborah" <drose@BrwnCald.com>
> **To:** "Day, Eric" <eday@ci.oswego.or.us>
> **Cc:** "Holland, Jon R." <JRHolland@BrwnCald.com>, "Oveson, Pete" <POveson@BrwnCald.com>, "Eric Eisemann" <e.eisemann@e2landuse.com>, "crichter@gsblaw.com" <crichter@gsblaw.com>
> **Subject: LOTWP team resumes**
>
> LOTWP team resumes attached.
>
> Thank you.
>
> Deborah Rose
> Lake Oswego-Tigard Water Program • Business Manager
> Brown and Caldwell • 503-534-5438
> P Before printing, please think about the environment.

LAKE OSWEGO · TIGARD WATER PARTNERSHIP

4101 Kruse Way
PO Box 369
Lake Oswego, OR 97034

503-534-4238
www.lotigardwater.org

MEMORANDUM

CONFIDENTIAL – ATTORNEY CLIENT PRIVILEGE ASSERTED

TO: West Linn Planning Commission

FROM: Carrie Richter, Garvey Schubert Barer
Eric Eisemann, E2 Land Use Planning
Eric Day, Lake Oswego –Tigard Water Partnership

SUBJECT: Code Compliance Response

DATE: October 25, 2012

The Planning Commission received oral and written testimony that particular code criteria applicable to either the water treatment plant (WTP) or pipelines were not satisfied. Given the great deal of overlap in this testimony, rather than responding to particular individuals, this memo responds by setting forth these assertions, generally in italics, notes where this criterion was considered in the staff report and then provides a response relating back to staff's findings.

The applicant, Lake Oswego-Tigard Partnership (LOTWP) agrees with staff's interpretation of the applicable code and plan policies and concurs with its findings considering the evidence submitted.

Site Characteristics, Compatibility and Ability of the Sites to Accommodate the Proposed Uses

CDC 60.070(1)(a) - Site size
CDC 60.070(1)(b) - Adequate area for aesthetic design to mitigate
CDC 60.070(A)(2) - Site suitability based on size, shape, location, topography & natural features

CDC 55.100(B) – Contextual Design
CDC 55.100(B)(6)(c)-Transition of Commercial Uses

WTP Design:

- *Scale and mass not appropriate*
- *Proposal reduces values, reduces visual experience, reduces quality of life;*
- *Resembles a big box store – industrial-sized, regional scale WTP does not belong in ranch style neighborhood;*
- *Could lower building to two stories to provide a step down transition.*

WTP Seismic: High liquefaction of soils makes site unsafe.
WTP Construction: Cross shape exposes residents on interior to construction dust.
Intertie: not a factor because location of intertie does not drive location of WTP

Pipes: Not safe in residential area
Pipes can't fit into right-of-way without damaging other infrastructure;

Addressed in staff reports: WTP: Finding 4, Finding 5, revised
Pipes: Finding 8

WTP: The large site size, coupled with a compact WTP footprint allows for increased buffering; buildings are placed toward the center of the site away from residences allowing for setbacks to be much larger than those required by Code. The WTP is not like a big box store characterized by large parking lots, massive scale and unbroken facades or fenestration. Rather, this proposal results in a compact design, with varied facades broken up by several lower scale structures and small, non-intrusive parking lots and approximately 22% lot coverage. The cross shaped lot permits more immediate off-site adjacency but the centrality of the location, designed with RNA involvement, far exceeds the minimum FAR, lot size and setbacks in the R-10 zone. No evidence has been submitted that upon completion, the plant will have any negative impact on property values, building aesthetics or quality of life.

Noise generating facilities are centrally located and LOTWP will mitigate for noise. Compliance with the noise level standards is guaranteed by imposing a condition of approval requirement of a follow-up noise study after occupancy.

With regard to seismic concerns, qualified professional geotechnical engineers have confirmed that the soils are safe to accommodate the plant design as proposed.

The WTP has existed on this site since 1967 and West Linn approved upgrades to the WTP in 1980, 1988 and 1996. During all of these reviews, the City found that the plant was compatible. Given that most of the homes on Kenthorpe and Mapleton predate these approvals, staff notes no record of "any significant negative impacts that the existing facility has had on the neighborhood."

Pipes: Finding #8 of the staff report provides: "Although the Applicant's proposal will compete for space within existing utilities beneath Mapleton Drive, sufficient space exists for relocated utilities to be placed above or below the proposed pipelines; therefore, adequate area for the proposed uses exist." The City Engineer, who is licensed and qualified to know the limits for accommodating utilities within Mapleton Drive, as well as the professional engineers working with LOTWP, found that adequate spacing exists to install the pipe safely.

Consistency with the Needs of the Community Overall

CDC 60.070(A)(3) Needs – provide for a facility that is consistent with the overall needs of the community.

- *WL provides its own water;*
- *Other claimed benefits are non-existent or are provided as mitigation to offset impacts;*
- *Bolton is only a benefit if Bolton stays where it is - otherwise no benefit.*

Addressed in staff reports: WTP: Finding 6 revised
Pipes: Finding 10

WTP: The proposal will meet numerous community needs, the principal benefit being the implementation of the proposed West Linn Storm Water Management Plan which calls for improving the emergency supply capacity and reliability. Expanding capacity from 16 mgd to 38 mgd will potentially increase the availability for emergency water pending the execution of a new IGA, therefore, providing West Linn residents with greater certainty that emergency water will be there when it is needed. A reliable source of drinking water for Lake Oswego and Tigard and a safer, more environmentally friendly and sustainable operation within West Linn, will allow the cities to accommodate anticipated population growth thereby reducing development pressure in rural areas; and will reduce the expense of new infrastructure. West Linn's consulting engineers, Murray Smith and Associates, stated in a letter dated October 16, 2012 that "LOTWP's proposed upgrade allows construction of the Bolton Reservoir on the preferred existing site, and allows downsizing from 8MG to 4 MG."

The project will meet the needs of the community by furthering "dozens" of comprehensive plan policies (see revised finding 10) such as, right-of-way improvements on Mapleton and Kenthorpe, environmentally sustainable storm water facilities, community open spaces that include lighting, benches and an "important" public trail connecting Mapleton and Kenthrope. The trail will benefit school children walking to Cedaroak School. The proposal preserves natural resources and habitat and ensures opportunities for recreation. The staff report concludes: "While the improvements are not required of the applicant under CDC, the applicant has offered them for the benefit of the community."

Pipes: The WSMP identifies the emergency water intertie as a top priority for improving West Linn's water supply reliability for many years. To realize this potential, Lake Oswego and Tigard City Councils have offered an IGA to West Linn City Council and the South Fork Water Board for execution. Construction of the new intertie will improve system reliability.

Comprehensive Plan Consistency

CDC 60.070(C) - Comprehensive Plan

Transportation System Plan (TSP)

- *Trails not compatible with TSP;*
- *Too much construction traffic;*
- *Should take all steps to improve streets and sidewalks to West Linn standards of master plan, or fees paid in lieu (intersection improvements)*

Goal 2: Land Use Planning, Policy 8, Protect residential area from incompatible land uses

RNA Plan – Benefits (Goal 3.9) for Robinwood residents

- *Cost of impacts outweigh net benefits resulting in no benefit;*
- *Mary S. Young (MSY) Park improvements benefit the State of Oregon rather than the citizens of West Linn.*

Staff Report Addressed: WTP: Finding 10, revised
Pipes: Finding 14

WTP: With regard to the trails, staff found with regards to Goal 12 Transportation, Pedestrians, construction of a pedestrian path connecting the east end of Kenthorpe Way to Mapleton Drive will eliminate the need for the City of West Linn to construct this inter-neighborhood connection and "will provide a benefit to children walking to and from Cedaroak Park Primary School." The proposed "green streets" approach to frontage development is in keeping with the stated goal of providing alternatives to traditional neighborhood sidewalks and complies with the TSP.

With regard to traffic safety and mobility during WTP operation, staff concluded that the completed WTP will generate an additional 2 -3 average daily trips on Kenthorpe Way (ADTs) but, when the two houses along Mapleton Drive are demolished, the neighborhood will experience a net reduction of approximately 10 ADTs. Consequently, future WTP operations will not warrant any improvements to local intersections.

With regard to construction related traffic, the applicant hired DKS Engineers, the firm that prepared West Linn's TSP, to assess current traffic and transportation conditions in the project vicinity, to identify areas of concerns, and to propose mitigation strategies to alleviate transportation problems generated as a result of WTP and pipeline construction. The study found that (1) the transportation networks are adequate to address both existing and incremental changes in traffic volume resulting from construction activity, and (2) that construction activity could generate an additional 15 second delay during peak AM and PM commute hours at the Cedaroak and Mapleton intersection with Highway 43. (School busses use the Cedar oak intersection but not during peak PM hours.) The DKS study proposed temporary mitigation measures such as restriping Cedaroak to allow wider turn lanes and prohibiting truck from making a left turn off of Mapleton onto Highway 43. The DKS study found that the incremental change in construction related traffic warranted did not warrant any long-term physical improvements to these intersections.

Goal 8 Parks and Recreation, Policy 8, although not directly applicable, is satisfied because the pedestrian path fulfills the intent of this policy. Similarly the open spaces, frontage improvements and pedestrian lighting and benches are compatible with this policy. Further, MSY Park is the community park in closest proximity to and serves Robinwood residents.

In addressing these provisions, staff found that "with the conditions of approval proposed, the application will meet all of the provisions of the CDC; as such, it will be further more goals, policies and action measures that can be mentioned in the staff report. Additionally, staff found that the applicant's proposal satisfies several supplemental documents to the Comprehensive Plan, including the TSP, WSMP and the RNA Plan."

Pipes:
The subject properties are zoned to allow for "utilities, major," including water plants and pipelines, where the conditional use criteria are satisfied. Further, staff concluded that installation of a below-ground public utility as referred to in Policy 8 makes this policy inapplicable. As noted above, the WSMP identifies intertie upgrades as a way to meet the City's future water need.

Other Issues

Serving Stafford
Franchise fee not in place and the City should not subsidize this proposal
Alternative plant sites or water sources were not considered

We have explained that neither the Lake Oswego nor the West Linn comprehensive plans allow for extending services through Stafford.

Whether or not the city imposes a franchise fee is entirely within the control of the West Linn City Council. If such a franchise fee is imposed, LOTWP will be subject to assessment just like any other utility occupying the City's right-of-way.

No alternatives analysis was conducted with regard to the plant because: (a) the WSMP presumes that the plant and the intertie will continue to provide a reliable source of emergency back-up water; and (b) because there is no requirement that such a study be conducted.

Conclusion

For the reasons set forth herein, as well as the applications coupled with the staff reports, all of the applicable approval criteria have been satisfied. We respectfully request that you approve these applications.

PDX_DOCS:491491.1

Pelz, Zach

From: Day, Eric [eday@ci.oswego.or.us]
Sent: Thursday, October 25, 2012 11:58 AM
To: Pelz, Zach
Cc: Eric Eisemann; Carrie Richter
Subject: Fwd: Lake Oswego Memo_ WTP Code Compliance Response
Attachments: PDX_DOCS-#491491-v2-Lake Oswego Memo_ WTP Code Compliance Response.doc; ATT00001.htm

Zach,

Attached is a CDC compliance response for the record.

Thanks,

Eric Day

Sent from my iPad

Begin forwarded message:

> **From:** Carrie Richter <crichter@gsblaw.com>
> **Date:** October 25, 2012, 11:52:06 AM PDT
> **To:** "Day, Eric" <eday@ci.oswego.or.us>
> **Cc:** Eric Eisemann <e.eisemann@e2landuse.com>, Jon Holland <jrholland@brwncald.com>, "Heisler, Jane" <jheisler@ci.oswego.or.us>, "Komarek, Joel" <jkomarek@ci.oswego.or.us>, "norme@cfmpdx.com" <norme@cfmpdx.com>, Ed Sullivan <esullivan@gsblaw.com>
> **Subject: Lake Oswego Memo_ WTP Code Compliance Response**
>
> Attached is the Norm King response for submittal into the record.

Pelz, Zach

From: Crystal [crystaljoele@gmail.com]
Sent: Thursday, October 25, 2012 9:56 AM
To: Pelz, Zach
Subject: Objection to the Lake Oswego Water Plant
Attachments: Objection to Lake Oswego Water Plant.pdf; ATT00001.htm

Zack,

Please distribute the following letter to the planning commission for tonight's hearing. Thank you for your time.

Sincerely,

Crystal Tillman

October 23, 2012

Dear West Linn Planning Commission,

When I was 5 years old, my parents moved onto Mapleton Dr. I remember being a little girl and watching the walls of our house go up after school while I ate my snack. My parents chose Mapleton because it was a quiet street with little traffic, was in a good school district and next to the park. They chose the area because they believed this was a neighborhood they could invest both their time and money in and retire many years down the road. They moved here for good, not just as a stopping point.

Fast forward 22 years and today, my father had a procedure on his heart. The hours that posed the highest threat to him have passed, but sitting in his room tonight listening to the nurse talk about how important it was to call 9-1-1 and get an ambulance to the house IMMEDIATELY if his wounds were to open (they approached his heart through an incision in the main artery in his leg) because of the danger he would bleed out on the spot. Listening to the warning all I could think was, thank God our street is still accessible and the construction has not yet begun.

Our neighbors are elderly and need medical care. What if someone falls and help cannot get through? Who is responsible? Based on the legal requirements for emergency vehicles to have access to the street and the reality that the space available absolutely does not allow for vehicles to get through, if my father were to have a complication when the street were under construction my father would not have had access to the care he would need to live. The route proposed is not acceptable if there is a medical emergency.

I am opposed to the Lake Oswego water project. No longer am I a resident of Mapleton- my days of being 5 are long gone, but I care about the neighbors who saw me grow up and who came to neighborhood potlucks on our driveway. I care about their safety, their lifetime investment in both the property they own and the community they have built. I am ashamed in the government of West Linn failing to represent its citizens and exceptionally disappointed this is a letter I have to write in the first place. The behavior of Lake Oswego is appalling. It is insulting to our community that they refer to themselves as "good neighbors."

The city of Lake Oswego is suing my parents because they will not sign over their legal rights to their lot's CCRs. They have gone as far as to demand every e-mail, personal or not, that is in any way related to the plant be turned over for their lawsuit. This is absurd. This is infuriating. This should never happen in our city.

If this proposal were to go through, not only would it place the neighborhood in danger, it would cripple the businesses on or along highway 43. Small businesses simply do not survive a 3-year detour on the roads that bring their customers. The small businesses are one of the primary lifeblood of West Linn. Are we willing to sacrifice the survival of men and women in this town who chose to open their doors to our community? Key individuals in West Linn's city government with ulterior motives say yes- we the people say NO. This proposal is a dagger to local business on or near not only Mapleton Drive, but along highway 43.

The residents of Mapleton Drive have been told that when construction is underway, they should plan on and expect to be without water for up to eight hours a day. They have not been told, however, when this will start or for how many years they should plan on being without water. This is a service West Linn residents pay to have access to. Once again, this is a street with predominately elderly residents who are retired and at their home for the majority of the day. If fire trucks are not able to access certain part of the street once this construction starts, and there is no water in addition, what does happen if there is a fire? This street is next to a state park roughly 128 acres in size. It is irresponsible to approve a plan that would cripple emergency response.

Unfortunately, this is not the first time this story has played out. This is not the first time politics and back door deals have caused a community to lose what it has worked so hard to gain. Further, this will not be the last time the little guy (your neighbor) gets pushed around. There are a plethora of reasons I oppose this plant inclusive of:

12. Lost value of homes that the residents of Mapleton Drive are relying upon to both live and retire. Changing the zoning to residential/ industrial WILL decimate the value of its homes and drastically impact ability to sell properties in the future.
11. Health and safety of river levels.
10. Structural issues of homes along Mapleton.
9. The crippling of small business along Highway 43.
8. Disruption of the quality of life for at least 3 years of any person living in or conducting business in the proposed area or traffic routes.
7. Damage to West Linn infrastructure.
6. Change in the culture of a neighborhood residents have invested in due to its laws and regulations.
5. Traffic that will impact Cedar Oak Park Elementary school and the safety of its students.
4. NOISE and the abundance of disruption the construction will cause for 3 years, and the plant itself will cause forever. We don't need or want another "park." We want our neighborhood to be RESIDENTIAL.

3. There are plenty of other places the city of Lake Oswego could put this plant. It is insulting to the residents of Mapleton to be told that Lake Oswego's land is "too valuable" and therefore this is being placed in their neighborhood. (And we call this being a "good neighbor?")
2. There is absolutely no real benefit to West Linn. Absolutely none. The only promise we get out of this deal is that our roads will be torn up for years, our businesses will suffer, and our city will lose value.

Above all else, and the absolute **number one reason** I oppose this proposal is the <u>safety of the people and structures that will inevitably be impacted by this project</u>.

I am thankful that I was brought up in West Linn. My parents made a fantastic choice to move into this school district, into this community, and into this culture. Please do not allow the city of Lake Oswego to destroy this. While this is not your back yard, I urge you to approach this as though it were you own home being threatened. Approach this as though you were being sued simply because you refused to give up your rights because what the big guy wants will destroy all you have built. Take into consideration the safety of the residents of West Linn and weigh the costs of this project on the city as a whole. Please deny Lake Oswego permission to proceed with this plant as currently planned. Stand up for your neighbor.

Thank you for your time.

Sincerely,

Crystal Tillman

From: Sonnen, John
Sent: Wednesday, October 24, 2012 3:53 PM
To: Pelz, Zach
Subject: FW: Lake Oswego water project

John Sonnen, Planning Director
Planning and Building, #1524

West Linn Sustainability Please consider the impact on the environment before printing a paper copy of this email.
Public Records Law Disclosure This e-mail is subject to the State Retention Schedule and may be made available to the public.

-----Original Message-----
From: Cummings, Teri
Sent: Wednesday, October 24, 2012 3:49 PM
To: Paula Novak
Cc: Sonnen, John
Subject: RE: Lake Oswego water project

Paula thank you for writing to share your opinion with me. I am forwarding it to Planning Director John Sonnen be placed on the record before the Planning Commission.
Best regards,
Teri Cummings

22500 Salamo Road
West Linn, Oregon 97068

503-635-9241

Councilor Teri Cummings
mailto:tcummings@westlinnoregon.gov
West Linn City Councilor
22500 Salamo Rd
West Linn, OR 97068
P: (503) 657-0331
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Web: http://westlinnoregon.gov

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Public Records Law Disclosure This e-mail is subject to the State Retention Schedule and may be made available to the public. ________________________________
From: Paula Novak [toursbypaula@comcast.net]
Sent: Wednesday, October 24, 2012 3:33 PM
To: Cummings, Teri
Subject: Lake Oswego water project

In a word please don't support this project. It will decimate the local businesses located on Highway 43. Think of the qualify of life for West Linn residents. Lake Oswego can deal with its own water issues with ruining our City.

Paula Novak
5695 Summit St
West Linn, OR 97068

Pelz, Zach

From: ericjones2009@aol.com
Sent: Wednesday, October 24, 2012 3:23 PM
To: Pelz, Zach; Ericjones2009@aol.com
Subject: Testimony for CUP-12-02/DR-12-04 & CUP-12-04/DR-12-14
Attachments: JMJ LOT PC Testimony 10-24-12.pdf

Zach,

Please add Jeane Jones' testimony (attached) to the record for CUP-12-02/DR-12-04 & CUP-12-04/DR-12-14 and confirm this has occurred.

Thank you,

Eric Jones

TO: West Linn Planning Commission

RE: Lake Oswego-Tigard Water Partnership, LOT Water Treatment Plant and Pipeline

Letters can be mailed to:
West Linn Planning Commission
22500 Salamo Road
West Linn, OR 97068 or emailed to
zpelz@westlinnoregon.gov

I would like to submit this letter as my recorded testimony to the West Linn Planning Commission for the meetings scheduled regarding the Lake Oswego-Tigard Water Partnership Water Treatment Plant.

The cities of Lake Oswego and Tigard are requesting a Conditional Use Permit to expand the current Water Treatment Plant on Kenthorpe Way in West Linn in order for Lake Oswego to enter into a revenue generating agreement with the city of Tigard to provide drinking water for Tigard. To do so, they need a conditional use permit.

Chapter 60 (Conditional Uses) of the West Linn Community Development Code requires that the purpose for the conditional use meets certain standards under which conditional uses may be permitted., enlarged or altered, and how development conditions can be met. More specifically, Chapter 60.070, Approval Standards and Conditions, states that the Planning Commission shall approve or deny an application for a conditional use based on findings of fact with respect to addressing of the following criteria:

1. The characteristics of the site are suitable for the proposed use considering location etc.
2. The granting of the proposal will provide for a facility that is consistent with the overall needs of the community.

In regard to the two issues above, I do not believe that there is any "community benefit" to West Linn or the Robinwood Neighborhood. Additionally, the facility is not consistent with the overall needs of the community. Most of the benefits that the LOT plan lists are either already in place (intertie) or will have to be done because the scope of this construction will destroy existing streets, pipelines and Mary S. Young State Park.

More specifically, CDC60.070 (A)(2) Shape: The "cross" shape of the applicant's property exposes residences located at the "interior corners" of the site to noise, dust, traffic and light impacts from the operation of the plant and, particularly, the same impacts from construction. The proposal is not compliant.

(Location): The site is not in compliance with 60.070(A)(2) with regards to location. The sheer scale or mass of the facility is not appropriate. The size and height lower property values, reduces privacy, attracts industrial traffic, reduces the visual experience and imposes impacts that reduce residents' quality of life. The size and mass of the WTP will be comparable to that of a Home Depot, Costco, Walmart Super Store or a similar big box store. The 3 story WTP is proposed to be a **regional** Water treatment plant. It simply does not belong in a residential neighborhood where the predominant housing type is ranch style occupied by families.

CDC60.70 (A)(2) requires that the site must be safe geologically and topographically. Engineers now know that the site is not stable due to a high liquefaction factor. The proposal is not compliant. Additionally, the location of the intertie is not a factor in location as claimed by the applicant. It will be located any place near the finished water pipeline. The location of the intertie does not determine the location of the WTP.

Also, West Linn has a policy of opposing development in the Stafford Triangle. This proposal assumes an eventual allocation use of water produced by this plant expansion to the Stafford Triangle.

60.070(A)(3) requires that the proposal provide a facility that is consistent with the overall needs of the community. West Linn provides sufficient water for itself. Other benefits claimed in the application are quite limited. The intertie already exists. Additional benefits are non-existent until West Linn expands the size of intertie. Water required during the replacement of Bolton Reservoir is only a benefit if West Linn continues to locate the reservoir in the same seismically and geotechnical impaired site.

Additionally, West Linn Citizens will have to endure 2+ years of constant construction including heavy truck traffic and loud heavy machinery noise for 11 hours EVERY weekday and 9 hours EVERY Saturday and Sunday unless we are spared some Sunday work as LOT has indicated may happen under normal conditions. If they did work on Sunday, there would be 89,472 truck hauls in the neighborhood and if they did no Sunday work whatsoever and the job finished on time and the job ends on the first day of the month on the month cited by LOT for the job ending, the total number of truck trips for the job would be 77,760. And this does not include additional vehicular traffic. Please see the attached Calculation sheet. West Linn Citizens will be subjected to this type of construction for 6 or 7 days a week ... for 2 years – all for a *Revenue Generating Agreement* between two other cities, Lake Oswego and Tigard that most likely will cause irreparable harm to the citizens of West Linn and destroy the good neighbor policies of West Linn. Please do not let them divide our community.

In addition, West Linn Citizens will have 2+ years of extremely limited access to their homes 24 hours a day, 6 to 7 days a week during this construction. The impact of this construction, especially to West Linn Senior Citizens living in this area, will be lifechanging in their daily routines. Also negatively affected will be main transportation and pedestrian routes and 24-hour emergency vehicle access. West Linn Citizens will be exposed to the possibility of reduced property values and irreparable damage to their homes because of pipeline placement and possible pipe breakage which will be the fiscal responsibility of the West Linn Citizens, not the cities of Lake Oswego or Tigard. Due to the extent of the work planned, businesses will suffer seriously with some going bankrupt and jobs in West Linn lost.

Signature

Additionally, the characteristics of the site are not suitable for the proposed use considering location since it is an industrial expansion in a residential area.

It does not meet the overall needs of the community since <u>it will cause havoc on a residential neighborhood and will create economic hardship to the community due to the loss of businesses and jobs as a result of the extensive highway construction and bottleneck traffic that it will create even with highway work being done in the evening.</u>

<u>Based upon calculations using the information provided by the Lake Oswego Tigard report i.e. pages 10 and 11 of the Construction Management Plan, there will be an exorbitant number of additional 89,472 of truck trips, (please see calculations attached), in addition to the other construction related vehicular traffic. This will create bottle neck traffic on a highway that already had high traffic counts.</u>

<u>These numbers could change depending on how many Sundays they work, depending if they will work for the entire last month or only to the first of the last month (we have been conservative and calculated that they would only work to the first of the last month, and depending upon how much extra vehicular traffic this work brings to the area, which is anticipated to be significant, in addition to the extra number of vehicles used to simply bus the workers in and out each day. In addition this project very likely will not wrap up on time. Please see the calculations attached.</u>

<u>This will effectively route people away from the businesses in the area for an extensive amount of time and make it exceedingly difficult for residents to live their daily lives.</u>

There also was insufficient notice to the business community. LOT states that they provided notice to businesses, but it now appears from what they are now saying that their concept of notice was in the form of some general handouts and mail outs to some businesses during the busy Christmas Holidays of 2011. Some would suspect that LOT did not want the business community involved since they chose to do what they did during the busy Christmas Holiday season. There was a total lack of any emphasis of delivering the handouts to the owners of the business, but merely to people working at the location as almost none of the business owners were aware of this proposal until a week or two ago. If LOT was sincere in their efforts to engage the local business community LOT would have gone about this differently. It would have directly contacted the owners of the businesses and discussed this matter with them straight up in a meaningful way instead of feigning contact with the business community by sending generic mail by regular deliver in the middle of the holiday season or dropping off materials to employees during the busy holiday season.

This project will devastate the quality of life for the neighborhood. Additionally, the invalidation of covenants established in 1944 by the City of West Linn to protect property zoning on Mapleton Drive is not in the best interest of the community.

The proposal also does not comply with the applicable policies of the Comprehensive Plan since, among other things, LOT has deceptively tried to state that they provided meaningful notice which temporarily and initially minimized certainly businesses involvement. The residential area and the business community on Highway 43 are not being protected from the negative impact of this development. Additionally, this proposal will create an expansion of incompatible land use.

Also, the applicable requirements of the zoning laws are not being met since the zoning is R-10, Single-family Residential Detached: R-4.5, Single-family Residential Attached/Duplex; GC, General Commercial and what is being proposed is inconsistent with this classification since the Comprehensive Plan Map lists the entire neighborhood as Low Density residential.

LOT wants it both ways. LOT exempts itself from an election to approve the easement through Mary S. Young Park because Mary S. Young is a State owned park. But then claims the improvements to the park required by ODFW benefit the citizens of West Linn. It seems that they benefit the owner....the State of Oregon. If the improvements benefit the citizens of West Linn, then shouldn't the citizens of West Linn be able to vote on the crossing of the park.

I do not believe that a redundant I205 Crossing is in the 2008 Water Master Plan, particularly at a site as bad as the Robinwood crossing. A Robinwood crossing is not a legitimate benefit to West Linn.

I urge the City Planning Commission members to please keep in mind that some of the benefits claimed by LOT are paid for by the citizens of West Linn and they are required. The costs to the citizens of West Linn which is "huge" and extensive should be included in the calculation of benefits with the required <u>net</u> result being positive.

Additionally, 60.070 (C)(6) says the City may require (by conditions of approval) the "street to be improved, including all steps necessary to address future street improvements identified in the adopted master plan". This plan does not do this. LOT should be required to improve the streets and sidewalks to the standards of the master plan.

60.070 (C)(7) says that the City may require that intersections should be improved to levels indicated in the master plan or fees paid in lieu. This proposal does not include any intersection improvements.

Signature

60.070(C)(4) allows the City to lower the building height to 2 stories so the building would be in compliance with the Robinwood Neighborhood Plan with regards to height and be more compatible with surrounding properties.

60.090(A)(1) requires that reconstruction of highways, roads, bridges etc. be consistent with the West Linn transportation plan. This plan does not do this.

Chapter 55.100(B)(6)(b) requires that the proposed structure(s) shall be compatible with the existing structures on the site and adjoining sites. Contextual design is required. The proposed water treatment plant is in no way in compliance with this paragraph. I am not sure it is even possible.

The applicant is not in compliance with In 55.100(B)(6)(c). The applicant has attempted to have a step down transition on two sides but it is not successful. The lower structures add to the bulk as they do not adopt the design features of the large building. Neither is contextual.

The LOT pipeline is not in compliance with 60.070(A)(2) with regards to location. The 42" and 48" pipelines are too large to fit into the available right of ways without damaging existing infrastructure. The construction is too invasive and creates too many unsafe conditions for residents. The size of the pipes is regarded in the community as unsafe in a residential area. The pipeline should be located elsewhere.

Unless the applicant can meet levels of allowed **impulse** sound specified in chapter 55.100(D) on highway 43 during nighttime work, the night time working hours should be limited to 6:00 PM to 9:00PM to allow residents to sleep. Regardless of the work hour impulse sound standards should be met. Chapter 60 allows the hours of work to be adjusted by condition. Keep in mind, evening work hours will not be productive for restaurants either.

Undergrounding of utilities in the right of way being improved may be conditioned under 60.070(C). The application does not propose undergrounding utilities on Mapleton, Kenthorpe or Highway 43 even when the utility is in the path of said construction. It seems that when the ground is open is a good time to underground utilities. Undergrounding utilities is a goal in the Comprehensive Plan.

West Linn government should be watching out for our best interests of the residents and businesses of West Linn. West Linn residents and businesses should not suffer or be required both directly and indirectly to subsidize the construction and operation of this plant.

Nowhere in this proposal or in conditions of approval are contracts for services required. These must be required.

LOT does not pay property taxes, and in 50 years has not paid any franchise fees or transportation fees which shows extraordinary favoritism to LOT over citizen which is unacceptable. Any conditions of approval, which we are vehemently against, must require cost recovery contracts with City and County agencies.

I strongly urge you to please reject this proposal because it will bring substantial harm to the citizens and business and jobs of West Linn because **this plan is a neighborhood killer, a business killer and a job's killer.** It will also kill the great neighborly spirit that has existed amongst all of our neighbors now for many years and permanently divide our community.

Respectively Submitted:

Jane M. Jones
Signature

4310 MAPLETON DR. W.L.
Address

Please print name JEANE M. JONES

Email Address ericjones2009@aol.com

Phone number 503-636-1355

Any additional comments: I will not be safe in my home if this Project proceeds.

I cannot sell my house right now, because L.O. is suing me.

I opposed the plant in 1967 and I oppose the expansion now.

[signature]

Thank You!

Pelz, Zach

From: Sonnen, John
Sent: Wednesday, October 24, 2012 8:04 AM
To: Pelz, Zach
Subject: FW: Intent versus Letter of the Law

Please add to the record

John Sonnen, Planning Director
Planning and Building, #1524

From: Dave Froode [mailto:dfroode@comcast.net]
Sent: Wednesday, October 24, 2012 7:36 AM
Cc: Sonnen, John
Subject: Intent versus Letter of the Law

Please enter these comments in to the record for LOT CUP application. Thanks

There has been a number of situations in this process the City of West Linn has demonstrated bias and negligence during it's evaluation of our city's rules.

Chapter 28 clearly states set backs from surface water sheds. What Chapter 28 does not say "except if tunneling". Had the authors of Chap. 28 intended to exempt tunneling, they would have said so. Chapter 28's intent was to protect the water shed from adverse impacts all around it, not just above ground. For the City of West Linn to front end load Chapter 28 by allowing tunneling plus construction activity in close proximity during raining winter months is not in compliance with the code. 50 feet is less then what the code calls for. If WL wants to alter the code to exempt tunneling, then do so. But for now, the code should apply as written.

The West Linn City Charter requires a community vote any time a park is subject to change. Because Mary S Young Park is under a 22 year lease with Oregon State Parks, West Linn has stated the charter does not apply and a community vote will not occur. Once again WL circumvents the intent of the rule which is to protect city parks. If some one else wanted to do some thing in MSY park that party would be under the full authority of WL declaring MSY a city park. Every rule in the book would apply and they should now.

Here are two apparent examples of bias. Chapter 28 does not specifically exempt tunneling yet the city allows it. The Charter does not specifically include leased parks so the city does not allow the vote. That is called "cherry picking".

Next, even though the City of West Linn, LOT and OSP stated the tunneling will not have an adverse impact, the three have brokered a payment of $90,000.00 to West Linn intended to be used for park improvements. If WL does not own the park and there is no adverse impact, why did OSP, LOT and WL enter in to such an agreement? Are they all recognizing some form of ownership? Does LOT and WL think they can buy favor or declare this a benefit to WL? Regardless of the reason(s), if Mary S Young Park is not city owned, and there is no adverse impact, it is very inappropriate for the WL Parks Department to receive this money and call it a benefit. The City of West Linn can not have it both ways. Once again the WL shows bias. This is wrong.

We are a society that functions by its' laws. During this process, time after time the WL demonstrated bias towards the applicant circumventing our rules to their mutual advantage. This compounded by WL negligence has created a very precarious environment for many citizens in West Linn.

David J. Froode
West Linn Oregon

City of West Linn Planning Department
22500 Salamo Road
West Linn, Or 97068

October 06, 2012

It has recently come to my attention that Lake Oswego is planning a major expansion of its water treatment plant in the Robinwood neighborhood, moving onto lots that are zoned residential. I am writing to voice my objection to this plan and to ask that as a planning commission member you exercise your power to support that neighborhood in their fight against the project. As a taxpaying resident of West Linn, I am confident in saying that the reason we chose to live in this city is for its pleasant, quiet residential neighborhoods. It is shocking to me that our own city's planning department would approve anything of such industrial scale in a long-established neighborhood. I do not live in that part of the city, but I can certainly see what a dangerous precedent this is for all neighborhoods in West Linn. Is it not the planning department's mission to keep West Linn liveable? Can you honestly say that you would welcome the intrusion of an industrial facility right next to your home?

Please use your authority to stop the plant.

Thank you for your consideration.

Nicole Winters,

RECEIVED
OCT 9 2012
PLANNING & BUILDING
CITY OF WEST LINN
INT.______ TIME______

20365 Hoodview Ave
WL OR

RECEIVED
OCT 1 8 2012
PLANNING & BUILDING
CITY OF WEST LINN
INT ___ TIME ___

TO: **West Linn Planning Commission**

RE: **Lake Oswego-Tigard Water Partnership**

Date: **October 8, 2012**

Letters can be mailed to:
West Linn Planning Commission
22500 Salamo Road
West Linn, OR 97068

I would like to submit this letter as my recorded testimony to the West Linn Planning Commission for the meeting scheduled on October 17th, 2012 regarding the Lake Oswego-Tigard Water Partnership Water Treatment Plant

The cities of Lake Oswego and Tigard are requesting a Conditional Use Permit to expand the current Water Treatment Plant on Kenthorpe Way in West Linn in order for Lake Oswego to enter into a **revenue generating agreement** with the city of Tigard to provide drinking water for Tigard. It is my understanding according to the West Linn Comprehensive Plan, the approval of a Conditional Use Permits **REQUIRES** a **"community benefit"**.

I don't believe there is any "community benefit" to West Linn or the **Robinwood Neighborhood** if this application is approved. Most of the benefits the LOT plan lists are either already in place (intertie) or will have to be done because the scope of this construction will destroy existing streets, pipelines and Mary S. Young State Park.

I do see an enormous list of horrific things no one could possibly consider a "community benefit" including:

- **West Linn Citizens** will have to endure 2+ years of constant construction including heavy truck traffic and loud heavy machinery noise for 11 hours EVERY weekday and 9 hours EVERY Saturday and Sunday. West Linn Citizens will be subjected to this type of construction for 7 days a week ... for 2 years – all for a *Revenue Generating Agreement* between the cities of Lake Oswego and Tigard.
- **West Linn Citizens** will have 2+ years of extremely limited access to their homes 24 hours a day, 7 days a week during this construction. The impact of this construction, especially to West Linn Senior Citizens living in this area, **Will Be Life Changing** in their daily routines. Also negatively affected will be main transportation and pedestrian routes and 24-hour emergency vehicle access.
- **West Linn Citizens** will be exposed to the possibility of reduced property values and irreparable damage to their homes because of pipeline placement and possible pipe breakage which will be the fiscal responsibility of the **West Linn Citizens.** Not the cities of Lake Oswego or Tigard.

Secondly, how can West Linn ALLOW Lake Oswego to **invalidate covenants established in 1944 by the City of West Linn** to **protect** property zoning on Mapleton Drive? How can West Linn even consider giving Lake Oswego the opportunity to exercise the option to use "eminent domain" in the city of West Linn? Up until now dealing with the Lake Oswego Water Treatment Plant has never been a problem for this neighborhood. It is now.

Lake Oswego's sole reason for expanding this plant is to build a revenue base by supplying water to Tigard. And they want to create this revenue base as cheaply as possible. **Who's looking out for West Linn Citizens?** You Should Be!

The City of West Linn asked us the question: "How does this proposal meet or not meet the approval criteria for a Conditional Use Permit?" As a **CITZEN OF WEST LINN**, that's the question you must ask yourself. You represent West Linn. You need to think very carefully about the **CITIZENS OF WEST LINN** who will be so impacted if you give your approval to this Conditional Use Permit.

Respectively Submitted:

JOSH JOHANSEN	3250 FOREST CT. WEST LINN
Name	Address
Erin Johansen	3250 Forest Ct. West Linn, OR 97068
Name	Address

Pelz, Zach

From: Kevin Bryck [kevinbryck@comcast.net]
Sent: Tuesday, October 23, 2012 10:53 PM
To: Pelz, Zach
Subject: More documents to be available for projection at the 12-02, 12-04 hearing on 10/25
Attachments: 0 Vote to Hear Appeal.jpeg; 1 4-5-67 minutes p1.pdf; 2 4-5-67 minutes p2.pdf; 3 4-5-67 minutes p3.pdf; 4 4-5-67 minutes p4.pdf; 5 4-19-67 minutes p1.pdf; 6 4-19-67 minutes p2.pdf; 7 4-19-67 minutes p3.pdf; 8 4-19-67 minutes p4.pdf; 9 4-19-67 minutes p5.pdf; 10 4-19-67 minutes p6.pdf; 11 Approval of Appeal 4-20-67.pdf

BEFORE THE BOARD OF COUNTY COMMISSIONERS
OF CLACKAMAS COUNTY, STATE OF OREGON

CLACKAMAS COUNTY
FILED
MAR 15 1967
[signature]
NO. 14670

In the Matter of Calling a Hearing on the appeal ... a Conditional Use request denied to the City of LAKE OSWEGO for property located on the south side of Kenthorpe Way, at its easterly terminus, Robinwood Area

This matter coming on regularly at this time to be heard, and it appearing to the Board of County Commissioners that Deane Seeger, representing the City of Lake Oswego, has made application to the Clackamas County Planning Commission for a water-treatment plant to be classified as a Conditional Use on property located as stated above, more particularly described as Tax Lots 11-11, 11-12, 11-16, 30, 31, 32, and 33, George Walling D.L.C., Section 24, T2S, R1E, W.M., and

It further appearing to the Board that said application was heard at the regular meeting of the Clackamas County Planning Commission on the 27th day of February, 1967, at which time the Planning Commission denied the Conditional Use as requested, and

It further appearing to the Board that Mr. Seeger, representing the City of Lake Oswego, did, on the 9th day of March, 1967, file an appeal of the Planning Commission's decision, and

It further appearing to the Board that pursuant to Section 13, of the Clackamas County Zoning Ordinance, the Board of County Commissioners shall hold a hearing in the matter, and that a notice of said hearing be published in a newspaper of general circulation in the County not less than ten (10) days prior to the date of said hearing, and the Board being fully advised in the premises,

IT IS HEREBY ORDERED that the hearing in the above matter be held on the 5th day of April, 1967, at the hour of 10:00 A.M., in Room 201, Courthouse, Oregon City, Oregon, to afford the general public an opportunity to be heard on the appeal, as set forth above, and

IT IS FURTHER ORDERED that the County Clerk be and is hereby directed to publish a notice of said hearing in the Lake Oswego Review, a newspaper of general circulation in the County, on the 23rd day of March, 1967.

DATED this 15th day of March, 1967.

BOARD OF COUNTY COMMISSIONERS

[signature]
Chairman

[signature]
Commissioner

[signature]
Commissioner

MINUTES

The Board of County Commissioners met in regular session on Wednesday, April 5, 1967 at 10:10 o'clock A.M. in Room 201, Court House, Oregon City, Oregon. Present were Chairman Stan Skoko, Commissioner Stan Ely, Commissioner Fred Stefani and approximately 50 people.

VACATION OF S. W. FOREST MEADOWS DRIVE

The first matter coming before the Board was the matter of the vacation of all of S. W. Forest Meadows Drive lying in Section 4, T.2.S., R.1.E., W.M. extending north and east from Knaus Road. The Affidavit of Posting is on file together with the Feasibility Report from the County Surveyor.

Mr. James Carskadon, Attorney representing the petitioners, telephoned this morning requesting the Board to consider an extension of time in the matter for a period of 30 days, so that certain matters pertaining to this vacation may be resolved before the Board renders a decision.

The Chairman advised the audience that this matter would be continued for 30 days. Order No. 14758 continues the matter until May 3, 1967 and Mr. Carskadon has been advised of this fact. The supporting papers in this matter are being retained in the Commissioners' Office until the next hearing date.

APPEAL OF A CONDITIONAL USE
City of Lake Oswego PCU-13-67

The City of Lake Oswego submitted an application for a conditional use for the purpose of constructing a water treatment plant on the south side of Kenthorpe Way at its easterly terminus, which is presently zoned R-10 Single Family Residential.

On February 27th the Planning Commission denied this application on the basis that the proposed use would be incompatible with the overwhelming single family residential character of the area and therefore could be adverse to the general welfare of the community. Today has been set for the City's appeal of this decision.

Mr. Deane Seeger, City Manager of the City of Lake Oswego, appeared before the Commission today and introduced the following people who spoke in behalf of the City of Lake Oswego:

Mr. Lloyd Anderson, of the firm of Cornell, Howland, Hayes and Merryfield, Consulting Engineers, appeared in behalf of the City of Oswego and explained Exhibit A, which is a topographical map setting forth the proposed site of the treatment plant, the proposed water line and the proposed water intake.

Mr. Ken Bielman, Corvallis, elaborated on Exhibit A stating that the source would be the Clackamas River in the Gladstone area and this line would go through the City of Gladstone, across the Willamette to the treatment plant and then to the City of Lake Oswego.

He continued that if the proposed treatment plant were located at some point north of Robinwood or Marylhurst, the operation would be too costly under this particular plan. He stated that a survey was made to locate the proposed plant on the east side of the river and it was found to be too costly to operate and maintain. Therefore, this site was rejected. The most economical site is the proposed location.

Mr. David Abraham, City Engineer for Lake Oswego, discussed the various sites which were considered. The three sites considered were: (A) Mary Young State Park; (B) property just west of Cedaroak School; and (C) property along the highway across from the Standard Service Station and the Presbyterian Church. Parcel A would be a most desirable site but it would be most difficult to acquire in that Mary Young has donated the park and is donating an additional parcel each year to be used for public park purposes. She has included a reversion clause as a stipulation to the donation so that if at any time the property is used for anything other than for public park purposes, the property would revert to her.

Parcel B is owned by the West Linn School District and they are retaining it for future school purposes.

Parcel C is an adverse site in that the topography is much more severe and therefore would be much more costly to construct. Furthermore, it would be situated closer to residential property. The topography is such that with the development of new homes above the site, the residents would look down directly on the treatment plant.

The proposed site is reasonably close to the river, the terrain is level, and in general is the best suited for this proposed treatment plant.

Mr. Russell Culp of the firm of Cornell, Howland, Hayes and Merryfield, elaborated on the illustration labeled Exhibit D, which is the site plan. He stated that the high service pumps which will be housed in an enclosed building would be about the only noise producing equipment. He states that he is sure that the operation of these pumps at peak hours would not emit enough noise to be heard outside the building. He continued that the only other equipment which could be heard would be the ventilating system and this noise would be limited to the plant site.

Mr. Lloyd Anderson stated that the amount of traffic generated will be about two to three trucks a month and about three to five cars a day. He states that there would be less traffic generated for this operation than there would be if the land were utilized for residences. He contends there would be a third of the traffic with this operation.

(At this point the Chairman read a letter of opposition to the treatment plant from Mr. Charles F. Hill, of 19050 S. Nixon Avenue, Lake Oswego, Oregon.)

The following people appeared in objection to the appeal for the conditional use:

Mrs. Charles Sams, Attorney, Masonic Building, Oregon City, Oregon: Mr. Sams stated that he is unable to understand why the City has only seriously considered sites for the proposed treatment plant in the Robinwood area when the operation is for the benefit of the City and could be located within the city limits. He informed the Board that the Robinwood area gets no water from the City but purchases their water from West Linn. He contends that the City has made no attempt to show comparisons of cost in purchasing, maintaining and operating this treatment plant at the various other sites. He continued that obviously Mary Young felt this operation would be a detriment to her proposed park and therefore he feels it would be a detriment to the residents in the Robinwood area.

(At this point Mr. Sams asked the people who were appearing in opposition to this conditional use to stand so that the Commissioners would be aware of the number respresented. Fourteen interested objectors stood.)

Mr. Bill Kargainis of 4428 S. Kenthorpe Way, Lake Oswego, Oregon: Mr. Kargainis recalled that there was at one time a serious drainage problem in the vicinity of Kenthorpe Lane and that the County came in and corrected the situation, which cost quite a bit of money. Now he feels this operation could jeopardize the drainage. Mr. Kargainis asked why the City did not try to locate this plant within their own City limits. He states that his home is in the neighborhood of $30,000 and is located the closest to the proposed site. Other homes in the area are in this price range and he feels this proposal would be a detriment to the surrounding property. He contends he cannot think of a three story structure within a distance of at least three miles. It appears that the building that would house the pumps would be three stories high.

Dorothy Hayes of 18626 S. Old River Drive, Lake Oswego: Mrs. Hayes stated she just wanted to go on record as opposing the proposed plant location.

Mary Hill of 19050 S. Nixon Avenue, Lake Oswego, Oregon: Mrs. Hill asked where the pipeline would be located in relation to the plant.

Doris Ellis of 4388 S. Kenthorpe Way, Lake Oswego, Oregon: Mrs. Ellis stated that she feels the City has everything to gain and nothing to lose and that the residents of the Robinwood area have everything to lose and nothing to gain if this treatment plant is constructed as proposed.

Dwight A. Battles, 4448 S. Mapleton Drive, Lake Oswego, Oregon: Mr. Battles asked if the Robinwood District would be able to get water from Oswego at the same cost or less than they are paying to the City of West Linn.

Representatives of the Consulting Engineering Firm and Deane Seeger advised the objectors that the site selection was based on the design, plan and the requirements for the Federal grant. They were informed that the wash water pipeline would be located approximately 1/2 mile away from the property and that no odor is involved in this type of operation.

The Board agreed to take the matter under advisement and contact the objectors when a decision is made if those objectors wished to leave their names with the secretary. The following people wish to be notified of the Board's decision:

Mr. Chuck Sams, 210 Masonic Building, Oregon City
Mrs. Mary Hill, 19050 S. Nixon Avenue, Lake Oswego
Jean Green, 3499 S. Walling Way, Lake Oswego
Doris Ellis, 3488 S. Kenthorpe Way, Lake Oswego
C. V. Brinkley, 3888 Kenthorpe Way, Lake Oswego
Bill Kargainis, 4428 S. Kenthorpe Way, Lake Oswego

The file in the matter is being retained in the Board of Commissioners' Office until a decision is rendered.

ZONE CHANGE APPLICATION
Arthurand Donald Hess PZC-3-67

Arthur and Donald Hess have made application for a zone change from I-2 Light Industrial and R-10 Single Family Residential to MR-1 Multi-Family Residential for the purpose of developing a trailer park to be located on the north side of Johnson Creek Blvd., about 1,400 feet west of 82nd Avenue.

The Planning Commission and the staff recommend approval of this zone change on the basis that the Development Pattern designates this as a potential multi-family and because of the geographical location should not be adverse to future industrial use in the area. However, the approval would be subject to the regulations of the R-10 Single Family Residential and the MR-1 Multiple Family Residential Districts and the recommendations of the County Health Department. Arthur Hess appeared in his own behalf but no one objected to the zone change.

Commissioner Ely moved that the zone change be granted and Commissioner Stefani seconded the motion. Motion carried. (File returned to the Planning Commission together with the Board's decision.)

APPEAL OF A VARIANCE
Harold L. Cox PVR-12-67

Mr. Harold E. Cox is appealing a variance application for the purpose of waiving the one acre required building site to allow the subject parcel to be used for two building sites of 15,625 square feet each. The property in question is located on the north side of Highway 26 in Brightwood, which is presently zoned Interim Rural (Agri.) Single Family Residential.

The Board of Adjustment denied this request on the basis that the creation of lots of this size would not be in keeping in size with lots in the general area and further that there is not sufficient hardship to warrant a smaller lot size than is required here.

M I N U T E S

The Board of County Commissioners met in regular session on Wednesday, April 19, 1967 at 10:10 o'clock A.M., in Room 201, Court House, Oregon City, Oregon. Present were Chairman Stan Skoko, Commissioner Stan Ely, Commissioner Fred Stefani, Deputy District Attorney James Redmar, Planning Director Don Morton, Deral McKeel and approximately 30 people.

ZONE CHANGE APPLICATION
James Routson PZC-4-67

Mr. James Routson is applying for a zone change on property located on the north side of King Road, approximately 800 feet east of Linwood Avenue, east of Milwaukie, from an R-7 Single Family Residential District to a C-1 Local Commercial District for the purpose of constructing a new medical-dental building. The Planning Commission and the staff have recommended that the zone change be granted.

Mr. Donald Huffman, Attorney, 2905 S. E. Oak Grove Boulevard, Milwaukie, appeared in behalf of this application. He stated that there are two older houses on the property at the present time and that a doctor and dentist want to establish professional offices on the premises after the present buildings have been razed. He stated he would not elaborate any further in the interest of expediency unless there were objectors present, of which there were none.

Commissioner Ely moved that this application for a zone change be granted. Commissioner Stefani seconded the motion. Motion carried. (Copy of the minutes have been forwarded to the Planning Commission)

APPEAL FOR CONDITIONAL USE
L. B. Moore PAP-2-67

Mr. L. B. Moore is appealing David Bradley's application for a conditional use on property located on the west side of 92nd Avenue, between Con Battin Street and Otty Road, in an area presently zoned R-10 Single Family Residential for the purpose of moving one duplex onto the property.

The Planning Commission and staff recomended approval of this conditional use subject to the following stipulations:

1. Architectural compatibility to the area.
2. Landscaping in keeping with the area.
3. Comply with County Zoning Ordinance regulations pertaining to duplexes.
4. Meet all County Building and Health Code requirements.

Mr. Lewis Larson, 9415 S. E. 92nd Street, Portland, appeared in behalf of Mr. Moore's appeal stating that the area is zoned single family dwellings and they want to keep it this way. Furthermore, that this would be a move-in duplex and a while back someone else moved in a residential house right

Mr. H. C. Carter and his son, Russell Carter, appeared in behalf of the appeal and explained with the aid of photos and a plot plan exactly what they anticipate doing at the aforementioned location. Mr. Carter said that he is familiar with the setback regulations in Seattle, Portland and Los Angeles and cannot understand why Clackamas County requires the setback that they do.

Mr. Carter was advised by Mr. McKeel of the Planning Commission that Industrial areas in Clackamas County do not require a setback but that this location presented a different situation; however, it was noted that the building across the street from Carter Manufacturing's proposed site has no setback. Mr. Carter related to the Board the fact that he has quite a bit of money already invested in the property with a retaining wall, septic tank and drain system, etc.

Commissioner Stefani moved that the appeal for a variance for Carter Manufacturing Company be granted. Commissioner Ely seconded the motion. Motion carried. (Copy of the minutes and the file have been forwarded to the Planning Commission.)

ALLEGED NUISANCE
Fred and Beulah Anderegg

On October 5, 1966 there was filed with the Board of Commissioners a petition requesting the abatement of an alleged nuisance purported to exist on Tax Lot 19 in the southwest quarter of Section 7, T.2.S., R.3.E. and located in Voting Precinct No. 1191.

After hearing all the evidence for and against this operation, from the various interested people present at that meeting, the Board agreed to continue the matter in order that the Commissioners could view the property and the surrounding area before making a decision. At this time the matter was continued indefinitely.

Today Mr. L. V. Mumpower of Route 1, Box 261, Clackamas and Mr. Cornelius Van Zyle of Route 1, Box 149, Clackamas, Oregon, appeared before the Commission and advised the Board that the operation is still in progress, with a turkey shoot being advertised for in the very near future. They stated that with the nice weather imminent, they know the operation will be going full force.

The Board agreed to draw an order directing the District Attorney to institute proceedings within the Circuit Court of the State of Oregon to abate the said nuisance. (Order No. 14833 directs the District Attorney to abate the nuisance.)

Chairman

Fred Stefani
Commissioner

BCC

Commissioner

dab

Pelz, Zach

From: Kevin Bryck [kevinbryck@comcast.net]
Sent: Tuesday, October 23, 2012 8:16 PM
To: Pelz, Zach
Subject: Documents to be available for projection at the 12-02, 12-04 hearing on 10/25
Attachments: 1967_appeal_doc_from_Clackamas_Co 10-12.pdf

12332

CU13-67

21E24BD 300

Decision Appealed & Reversed by Commissioners treatment plant therefore was approved

March 6, 1967

City of Lake Oswego
City Hall
40 "A" Avenue
Lake Oswego, Oregon

Gentlemen:

This is to advise you that at the regular meeting of the Clackamas County Planning Commission, Monday evening, February 27, 1967, your application for permission to construct a water treatment plant as a Conditional Use on property described as Tax Lots 11-11, 11-12, 11-16, 30, 31, 32 and 33, George Walling D.L.C., Section 24, T2S, R1E, W.M. was presented and carefully studied.

The Commission considered all the facts and evidence presented at the meeting, and subsequently voted to deny your request on the basis that the proposed use would be incompatible with the overwhelming single family residential character of the area and thus could well be adverse to the general welfare of the community as attested to by many residents of the district.

All correspondence and opinions orally expressed to the Commission were given careful consideration before a decision of denial was reached.

Pursuant to the Clackamas County Zoning Ordinance, Section 13, a Conditional Use application denied by the Planning Commission may be appealed to the governing body of the County within fifteen (15) days of the date of such denial, and shall be in writing and filed with the Planning Commission. (Appeal forms are available in the Planning office upon request.)

If you have any questions concerning this matter, please contact this office.

Sincerely,

CLACKAMAS COUNTY PLANNING COMMISSION

DERAL E. MCKEEL
Zoning Administrator

DEM:ft
cc: Board of County Commissioners
Persons responding (See attached list (8))

Hearing 4-5-67

RECEIVED
APR 4 1967
Board of Commissioners

19050 S. Nixon Ave.
Lake Oswego, Oregon
April 3, 1967

Clackamas County Board of Commissioners
Oregon City, Oregon

Dear Sirs:

This letter is written in reference to the City of Lake Oswego's appeal for a conditional use for a water treatment plant on Kenthorpe Way. As the appeal is at 10 A.M. April 5, most residents of the Robinwood area are unable to attend the hearing but feel as I do about the proposed installation. This feeling is reflected in the signatures on the petition presented to the Planning Commission on February 27, 1967. The decision of that body was just and correct and in keeping with the projected residential and commercial character of our small but proud area.

This planned development was done in conjunction with the Planning Commission and the Robinwood Community Club as a cooperative effort to prevent unsightly structures from corrupting the community. There was no attempt to restrict commercial progress as areas have been designated for this purpose. The West Linn School District has followed this pattern as has the Robinwood Water District with its office and fire station. These are a part of our community. The proposed plant is not. The Planning Commission has demonstrated the same opinion.

In our county as in others the trend is toward promoting the annexation of areas such as ours if incorporation is not feasible and this may be in the best interest of all. But there are certain rights these unincorporated, unrepresented areas do have - one of these is to be accorded equality with the larger, more powerful, and more articulate cities that exert an undue pressure when they have desires to be gratified.

Lake Oswego has turned down many similar zone changes within their city and continue to do so. Lake Oswego has land within its city limits on which to build this plant. Lake Oswego had no plans for water transmission from Kenthorpe to Oswego on the Feb. 27 hearing by admission of the engineer-designer when I questioned him. Elaborate plans were made with Gladstone but evidently none with the County concerning Robinwood. One can only assume they will plow through where they wish or lay it along the river and ruin our waterfront property. On March 28 Lake Oswego project engineer Kenneth Bielman indicated that the site acquisition had been only delayed and that they hoped to call for bids on schedule. Does Lake Oswego already know the decision of the Clackamas County Commissioners?

There is no attempt here to question the integrity of any of the bodies or persons mentioned herein but I do question the motive for the placement of the three story concrete and steel treatment plant that is unquestionably a totally nonconforming structure.

Sincerely,

Charles F. Hill

Charles F. Hill

Rec'd. RJM
27 Feb 67
320 SIGNERS
321 SIGNERS

PETITION

TO THE CLACKAMAS COUNTY PLANNING COMMISSION AND/OR THE COUNTY COURT

We, the under-signed of the Robinwood Cedar Oaks Park Area protest the request for a conditional use within a residential zone for the construction of a water treatment plant for the city of Lake Oswego for the following reasons:

1. It would destroy the beauty of our suburban surroundings.

2. It would ruin twelve homes and potential residential property.

3. It would be a mosquito menace.

4. There would be an objectional odor.

5. The noise from such a plant would be objectionable.

6. We would receive no benefit what-ever from such a plant.

7. We have no voice in Lake Oswego's civic or political affairs.

8. We are absolutely against any change of zoning, even conditional.

Cecil V. Brinckley	3888 S. Kenthorpe Way
Vivian C. Brinckley	3888 So. Kenthorpe Way
Byron P. Woodard	3979 S KENTHORPE WAY
Donna Woodard	3979 S. Kenthorpe Way
Doris Ellis	4388 S. Kenthorpe Way
M. C. Ellis	4388-S-Kenthorpe way
Alma L. Fragg	4388 S Kenthorpe Way
A. King	4257 S Kenthorpe Way
Evelin King	4257 S. Kenthorpe Way
Richard J Murphy	4160 SW Kenthorpe Way
Marie D. Murphy	4160 SW Kenthorpe Way
Audrene J. Bell	4040 Kenthorpe Way
Troy G. Bell	4040 Kenthorpe Way
Janis Kargianis	4428 S Kenthorpe Way
William Kargianis	4428 S. KENTHORPE WAY
Lester Tjaden	4445 S Kenthorpe Way
Marlys Tjaden	4445 S. Kenthorpe Way
Richard G. Wanker	3606 S. Kenthorpe Way
Annette M. Wanker	3606 S. Kenthorpe Way
Gertrude M Campbell	3611 S Kenthorpe Way
Lemuel M. Campbell	3611 Kenthorpe Way
May A. Calandra	3878 S Kenthorpe Way
Gary Calandra	3878 S Kenthorpe Way
Julius A. Larsen	3708 S. Kenthorpe Way
C. A. Blackison	4101 S Kenthorpe Way
Mary Lou Danner	3753 S Kenthorpe Way
E. Bruce Danner	3753 S. Kenthorpe Way

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NAME	ADDRESS
1 Mary M. Hill	19050 S. Nixon Ave Lake Oswego
2 Charles F. Hill	19050 S. Nixon Ave Lake Oswego
3 Martha M. Hastings	18717 S. Midhill Drive, Lake Oswego
4 Dortha I. Maxam	18891 S. Midhill Dr., Lake Oswego
5 La Verne Blake	4412 S. Mapleton Dr, Lake Oswego
6 AC Rasmussen	18730 S. Nixon Lake Oswego
7 Carson F. Heddle	18675 S. Nixon Lake Oswego
8 Norma R. Heddle	18675 S. Nixon Lake Oswego
9 Eleanor J. Bothen	18320 S. Nixon Lake Oswego
10 Mary J. [illegible]	18320 S. Nixon Ave Lake Oswego
11 Leon W. Carpenter	18333 So Steamboat Way - Lake Oswego.
12 Francine M. Carpenter	18333 S. Steamboat Way, Lake Oswego
13 Ralph E. Byrne	18400 S. Nixon Ave, Lake Oswego
14 Patricia ~~Stoddard~~	18444 S. Nixon Ave, Lake Oswego
15 Charles Stoddard	18444 S. Nixon ave Lake Oswego
16 Margaret Byrne	18400 S. Nixon Ave. Lake Oswego
17 Olver L. Woodrum	18340 S. Nixon, Lake Oswego
18 Dorothy A. Woodrum	18340 S. Nixon, Lake Oswego
19 Alice C. Binder	18406 S. Nixon Lake Oswego
20 Maureen J. Gilman	18480 S. Nixon Lake Oswego
21 Kory E. Gilman	18480 S. Nixon - Lake Oswego
22 James P. Gilman	18480 S. Nixon, Lake Oswego
23 Gordon Puebolo	4040 S. Glenn Terrace, Oswego
24	
25	

23

Richard T. Smith	3714 S. Mapleton Drive
Mrs. Richard T. Smith	3714 S. Mapleton Dr. - Lake Oswego
Mrs. Ronald R. Irwin	19556 S. Pacific Hwy, Lake Oswego
Mr. Ronald R. Irwin	" " " " "
Mr R.J. Wigg	3673 So Mapleton - Lake Oswego
Mrs. R.J. Wigg	" " " " " "
Maxine C. Daily	3701 S. Mapleton Dr. Lake Oswego -
Clyde R. Daily	" " " " " "
Beverly E. Brown	3708 S Mapleton Dr, Lake Oswego
Durwood Brown	" " " "
Kenneth Bilyeu	3711 S Mapleton Dr. Lake Oswego
Carol Bilyeu	" " " " "
Ruth E. Rehnke	3757 S. Mapleton Dr. Lake, Oswego.
Kenneth Summerville	3777 S. " " " "
Lucille Summerville	3777 S. " " " "
Mildred W. Locher	4305 - S. Mapleton Dr. Lake Oswego
M.K. Locher	4305 S. Mapleton Dr Lake Oswego
Jerry L. Bullock	3820 S. Mapelton Dr. Lake Oswego
Pat H. Bullock	3820 S. Mapleton Dr. Lake Oswego.
Emma C Kosta	3960 S Mapleton Dr.
Alfred Kosta	3960 - S - Mapleton Dr
Lida B. Jones	3951 S. Mapleton Dr. L.O.
Maynard L. Christensen	3990 S. Mapleton Dr. L.O.
Vera E. Christensen	3990 S. Mapleton Dr. L.O.
R.E. Rowning Jr.	4025 S. Mapleton Dr. L.O.
Muriel R Rowning	4025 S. Mapleton Dr Lake Oswego

26

Virgil M White 4120 South Mapleton Drive
Jeane M. Jones 4310 S. Mapleton Drive
Glenn L Stoner 4245 S Mapleton Dr Lake Oswego -
Jean K. Stoner 4245 So. Mapleton Dr. Lake Oswego
Ava Lee White 4120 S. Mapleton Dr. Lake Oswego
Erna S. Nelson 4226 S. Mapleton Dr Lake Oswego Ore
Harold E. Nelson 4226 S. Mapleton Dr. Lake Oswego ore.
Robert C. Thorington 4284 S. Mapleton Dr. Lake Oswego, Ore.
Dellamay Thorington " " " " " "
Maude C. Schmidt 4315 " " " " "
Louis Schmidt " " " " " "
Lyle V. Olson 4020 " " " " "
Geraldine C. Olson 4020 S. Mapleton Dr. Lake Oswego
Douglas G. Jones 4080 S. Mapleton Dr.
Emilia M. Jones " " "
Norma Jean Schmidt 4117 S Mapleton Dr. Lake Oswego Ore
Alton Schmidt " " " " "
Velma Stewart 4451 So. Mapleton Dr. Lake Oswego
Harry J Blake 4412 S. Mapleton Dr Lake Oswego
Goldy Leatherbury 4327 S. Mapleton Dr. L Oswego
Lester Leatherbury 4327 S. Mapleton Dr. Lake Oswego Oregon.
Julia A. Post 3963 - S. Mapleton Dr. Lake Oswego, Ore
Mary K. Eskridge 20182 S. Old River Dr Lake Oswego, Ore.
David V. Eskridge 20182 S. Old River Drive Lake Oswego Ore.

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Robert T. Soper	3315 So. Walling Way
Merna V. Soper	3315 S. Walling Way
[illegible]	3314 S. Walling Way
Hermena R. Murray	3314 So. Walling Way
Yvonne Bennett	3320 S. Walling Way
Durward Bennett	3320 S. Walling Way.
Evelyn [illegible]	3364 S. Walling Way.
Harry B. Machum	3364 S. Walling Way
Nancy L. Kowinski	3424 S. Walling Way.
Dan Kowinski	3424 S. Walling Way.
Beverly Kestek	3435 S. Walling Way
Raymond Kestek	3536 S. Walling Way
Robert E. Green	3499 S. Walling Way
Jean M. Green	3499 S. Walling Way
John Hootmans	18888 South Walling circle
Jean Hootmans	" " " "
Martha a Bryant	18891 S. Walling circle
Mary M. Krellwitz	18909 S. Walling Circle
Grace E. Dichtel	18950 S. Walling Circle
Robert N. Dichtel	" " " "
Wallace Pond	18993 S. Walling Circle
Angie Pond	" " "
Ruth Hillis	19023 S. Walling Circle
Wendell B. Hillis	" " "
Helen M. Ditter	19055 S. Walling Circle
Lillian M. Bailey	19055 S. Walling Circle

NAME	ADDRESS
Everett L. Phipps	4064 S Glen Terrace Way
Henry A. Fabert	3593 S. Cherokee Ct.
Mrs. Henry A. Fabert	3593 S. Cherokee Ct.
Harvey A. Harris	4084 S Cedar Oak Dr.
Mrs. Gordon Larson	3961 S.W. Ridgewood way
Albert B Krist	3780 S Cedar Oak Dr.
Mrs Albert B Krist	3780 S Cedar Oak Dr
O. L. Hampton	3801 S. Cedaroak Dr.
Mrs O. L. Hampton	3801 S. cedaroak Dr.
A. A. Hanson	3893 S. Cedaroak Dr.
Phyllis C Hanson	3893 S. Cedaroak Dr.
Mrs. E. R. Shappell	4044 S. Cedar Oak Dr.
[illegible] Roberts	19075 Trillium Way
Florence Robertson	19075 S. Trillium Way
John S. Howard	19895 S. Old River Dr.
Raymond E. Gibbons	18308 S. Midhill Dr.
Reynolds Howard M.	3056 S LAZY RIVER WAY.
Robert L. Miller	3680 S. Mapleton Dr.
Harold L Scofield	4030 S. [illegible] circle
Marlene E. Miller	3680 S. Mapleton Dr.
Neoma M. Phipps	4064. S. Glen Terrace Way
Eugene R. Shappell	4044 S Cedar Oak Dr.
Jeanette M. Hamel	19260 S. View Dr.
Judy Rubols	4040 S Glen Terrace Way
Frank J Colein	3855 S Cedar OAK DR

25

NAME	ADDRESS
Esther A. Colise	3855 S. Cedar Oak Park Lake Oswego
Marvin B. Lackey	4142 S Cedar Oak Dr Lake Oswego
Dorothy M. Lackey	4142 S. Cedar Oak Dr. Lake Oswego
Blain Nicholson	4194 S. CEDAR OAK DR., LAKE OSWEGO
Betty Nicholson	4194 S CEDAR OAK DR. LAKE OSWEGO
Anna H. Fleishman	4206 S Cedar Oak Dr Lake Oswego.
Otis F. Fleishman	" " " " "
Mrs Ruth E Eisele	4242 Terra Vista Crt. L.O.
Oscar C Eversmann	4299 S. Terra Vista Ct L.O.
Winnifred E. Eversmann	4299 S. Terra Vista Crt. L.O.
E. G. West	4344 S. Cedar Oak Dr.
Clae Williams	4424 S. CEDAR OAK DR.
Louise Williams	4424 S. Cedar Oak Dr. L.O.
Mr & Mrs. R. C Bailey	19016 S. Marshall Dr L.O.
Jerry Haino	4084 S. Cedar Oaks Drive
Stanley E. George	4114 S. Cedar Oak Circle
Marion L Eisele	4242 TERRA Vista Crt L.O.
O. L. McKinney	4488 - So Cedar Oak Dr.
Mrs O. L. McKinney	" " " "
Dorothy Polagnia	4552 Cedar Oak Dr.
Palma Hamersley	18901 S. Trillium Way. L.O.
R. L. Thom	18888 Trillium Way L.O.
Nora A Thom	18888 Trillium Way L.O
Mike Buckley	18811 Trillium Way L.O.
Jeanette Buckley	18811 Trillium Way L.O.

25

NAME	ADDRESS
Hazel E. Granquist	2766 S. Marylhurst Dr. Lake Oswego, Ore
Robert L. Koch	19595 S ~~Thomas~~ View Dr.
Zelda J. Koch	19595 S. View Dr.
Delbert M. Langeliers	19586 S View Dr.
Marion C. Langeliers	19586 S. View Drive Lake Oswego, Ore.
Dorothy A. May	19468 S. Midhill Dr. Lake Oswego.
Joseph C. Hamel	19260 S. View Dr. L. Oswego
Phyllis Cooper	2613 S. Robinwood Way. L. Oswego
Dora Overson	19612 S. Midhill Drive L. Oswego
Bonnie Rothgeb (with exception of 8)	19735 S. Midhill Dr. L. Oswego
~~Frank Glenn~~	2615 S. Marylhurst Dr. L. Oswego
[illegible]	2622 S. MARYLHURST DR. LAKE OSWEGO OREGON
Jesse Kregel	2757 S. Marylhurst Dr. Lake Oswego
Marilyn Kregel	2757 S. Marylhurst Dr. " "
Frank C. Glass	19611 S. VIEW DR. Lake Oswego, Ore.
Lorraine A. Glass	" "
Ida Schmidt	19512 S View Dr. L Oswego Oregon
Guy + Julia Lellmo	19515 S. View Dr. Lake Oswego
Elmer O White	19540 S View Drive Lake Oswego
Lela Mathis	19477 S View Drive Lake Oswego
Doris Dinges	19464 S. View Dr. Lake Oswego
Delores L. Wilson	19426 S. View Dr. Lake Oswego
Allen C. Wilson	" "
Carol M. Heisler	19275 S. Midhill Dr. L. Oswego
Dale A. Heisler	19275 S. Midhill Dr. L. Oswego

25/23

NAME	ADDRESS
Mrs. Walter O'Donnell	19192 S. Midhill Drive, Lake Oswego
Thomas E. Miller	19166 S. Midhill Dr. Lake Oswego
Alice M. Miller	19166 So Midhill Dr. Lake Oswego
Mrs. Estelene Maddox	19143 So. Midhill Dr. Lake Oswego
Elvis C. Maddox	19143 So. Midhill Dr. Lake Oswego
Walter N. O'Donnell	19192 So. Midhill Dr. Lake Oswego
Dana N. Roberts	19128 So Midhill Dr Lake Oswego
Harriett L Roberts	19128 S. Midhill Dr, Lake Oswego Or
Margie Steffey	19088 S Midhill Dr, Lake Oswego
Thelma J Hicks	19044 S Midhill Dr, Lake Oswego
Mr / Mrs. R.C. Bailey	1906 S. Midhill Dr " "
Daryl Parsons	2008 S Marylhurst Dr Lake Oswego
Anne E. Parsons	" " "
Roy Boland	19535 South View Drive Lake Oswego
Stella J Fuessner	18725 S. Pac. Hwy. Oswego
* Alice Richmond	19309 S. Midhill drive, L.O.
Michael J Mathis	19477 S View Drive
Victor Dinges	19464 S View Dr Lake Oswego Or
Gordon E. White	19540 S View Dr. Oswego, Or.
J.L. Schmidt	19512 S. View Dr Lake Oswego Ore.
Irene F Hoffman	19888 S View Dr Lake Oswego Ore
Richard S Hoffman	same
Dean C. May	19468 S. Midhill Dr. Lake Oswego Ore.
Joseph Brazney	19625 S, Midhill, Dr. Lake Oswego ORE
Dorothy Brazney	19625 S. Midhill Dr. Lake Oswego

25
23

	NAME	Address
1	Mrs. David E. Webb	18718 So. Roseway
2	Mrs. Robert A. Gaynor	18652 S. Roseway
3	Mrs. Anna M. Mohr	3344 S. Fairview Way
4	Mrs. Kathleen Hamblet	3366 S. Fairview Way
5	Mrs. Audrey Moore	18747 S. Roseway
6	Mr Grady Johnson	3262 S Fairview Way
7	Claude Farbutton	3220 S Fairview way
8	Mildred A. Farbutton	3220 S. Fairview Way
9	Bruce B. Kayser	3215 S. Fairview Way.
10	Robert W Williams	3171 S Fairview Way
11	Yvonne Williams	3171 S Fairview Way
12	Roger C Johnson	18530 S. Vista Court
13	Barbara Johnson	" " "
14	Robert L Weber	18525 S. Vista Court
15	Deanna J Weber	18525 S. Vista Ct,
16	Rosemarie Westwood	18485 S. Vista Ct.
17	Laurence L. Knapp	18455 S. Vista Ct.
18	Marie S. Knapp	18455 S. Vista Ct,
19	Carolynne Whitchurch	18460 S. Vista Ct.
20	K.C. Whitchurch	18460 S. Vista Ct.
21	Jack Bunnecker	3204 S Fairview Way.
22	Naomi Bunnecker	"
23	Elizabeth-Ann Rose	"
24	Robert N Rose	"
25	Louise M. Kayser	3215 S. Fairview Way - Oswego
26	Marie Patrick	3611 S. Ridgewood Way

NAME	address
Lydia J. Torgerson	19386 S.W. View Dr. Oswego. Oreg.
Don Latham	19412 S View Drive Lake Oswego
Elmer O. Ronning	19505 S. Midhill Dr. Lake Oswego
Garnett Ronning	" " " " " "
Helen M. Parenti	19585 S. Midhill Dr, Lake Oswego
George F. Miller	19634 S. Midhill Dr. Lake Oswego
Doris J Miller	19634 S Midhill Dr. Lake Oswego
Charles Reaney	2716 S O Robinwood Oswego
Betty Reaney	2716 S. Robinwood Way Lake Oswego
Weldon E. Chamberlain	19663 S. Midhill Lake Oswego
Jane E. Chamberlain	" " " "
Judith M. Farrell	18882 S. Midhill Dr. Lake Oswego
John Buckley	18933 S. Midhill Dr. " "
Norman E Riley	18754 S " " " "
Bill M Russell	18687 S. Midhill Dr. Lake Oswego
Patricia Russell	18687 S. Midhill Dr - Lake Oswego
Sandra A. Rood	18787 S Trillium Way
David E. Rood	18787 S Trillium Way
Jean Douglas	20240 S Old River Dr.
J. H Douglas	20240 S. Old River Dr.

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NAME	address
~~Mrs~~ Mrs D. C. Beier	19888 S. old Riverdr - Lake Oswego
Mr. D. C. Beier	19888 S. Old River Dr. Lake Oswego
Frank C Cathrell	19844 S. Old River Dr Lake Oswego
Jeanne Cathrell	19844 S. OLD RIVER DR. L.O.
Irene W. Warner	19079 S. Old River Dr Lake Oswego
Jay D. Cardiff	19775 S. Old River Dr. Lake Oswego
Georgie F. Cardiff	" " " " " " "
James Black	19728 S. Old River Dr. Lake Oswego
Mary M. Black	19728 So Old River Dr. Lake Oswego
~~Georgeann Pecker~~	~~19930 So Old River Dr. Lake Oswego~~
Geo D Pelker Sr.	19930 So Old River Dr. Lake - Oswego
Ellen C. Pelker	19930 S. Old River Dr. Lake Oswego
Georgeann Stark	19930 S. Old River Dr. Lake Oswego
Mark A. Lackey	20024 So. Old River Dr. Lake Oswego
Alice L. Lackey	20024 S. Old River Dr. Lake Oswego.
Louis Arthefler	3787 S Ridgewood Way Lake Oswego, Ore.
Thelma R. Hefler	3787 S Ridgewood Way Lake Oswego, Oregon
Doris J. Poppe	3753 S. Ridgewood Way Lake Oswego
Herman C. Poppe	3753 S. RidgeWood Way Lake Oswego Ore.
W. C. Walsh	3737 S Ridgewood Way Lake Oswego.
Laurie Walsh	3737 S. Ridgewood Way Lake Oswego
Jo Scott	3716 S. Ridgewood Way, Lake Oswego
Joanne Scott	3716 S. Ridgewood Way, Lake Oswego
Florence Riehl	19522 So. Old River Dr Lake Oswego
J. T. Riehl	19522 So Old River DR LAKE Osw

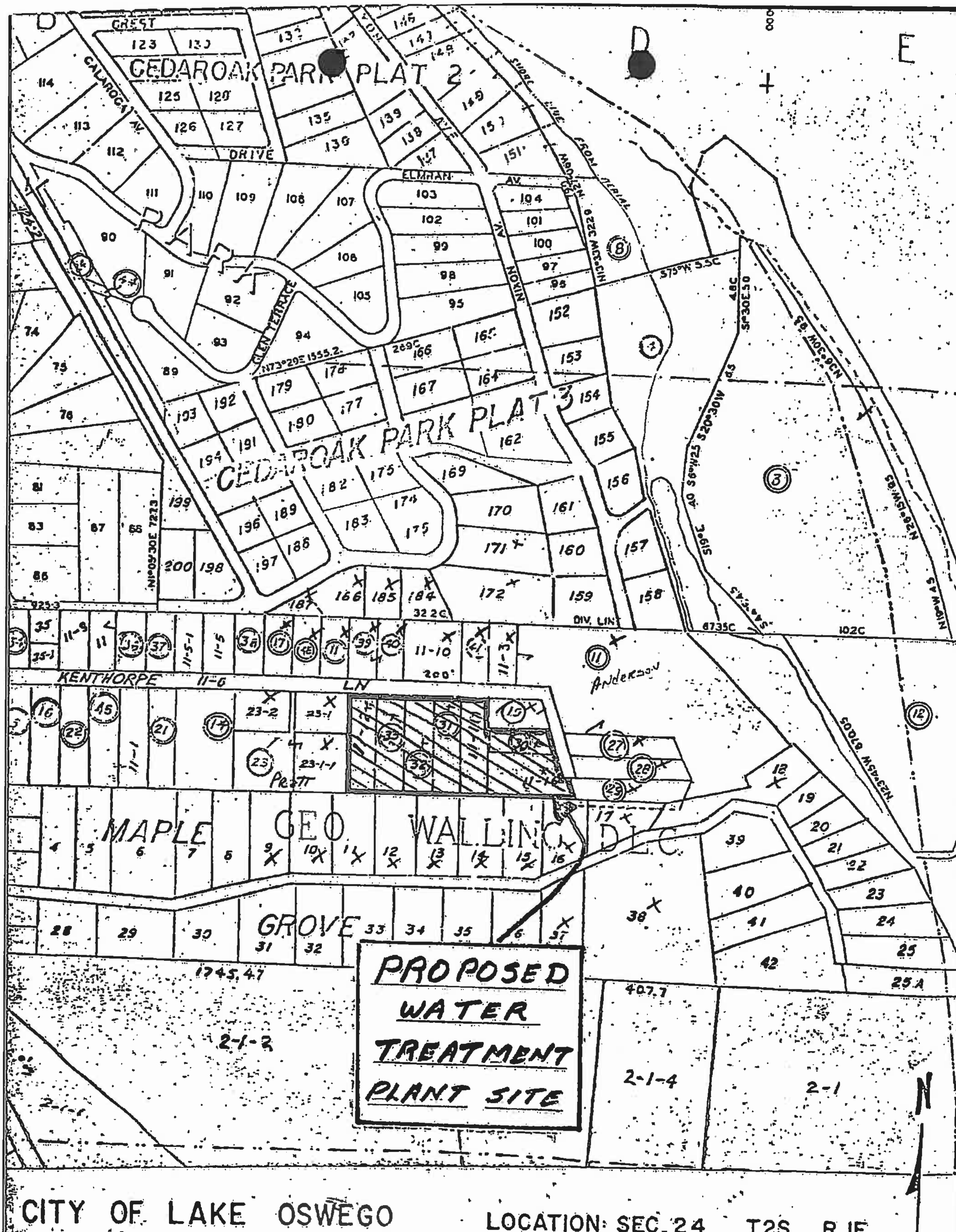
25
33

NAME	address
Robert Mercier	19717 S. OLD RIVER DR. L. O.
Harry E. Hill	19484 S. Old River Drive Lake Oswego
Mary D. Hill	19484 S. Old River Dr. Lake Oswego
Freda Edmonston	19477 S. Old River Dr. Lake Oswego
Milton Edmonston	19477 S. Old River Dr, Lake Oswego
M J Bowning	19445 S Old River Dr Lake Oswego
Joan Mary Bowning	19445 S. Old River Dr. L. Oswego
Marietta Thomas	19430 S Old River Dr L. Oswego
Wayne S. Thomas	" " " " " "
[illegible]	19085 S. Old River Drive L. Oswego
[illegible]	19085 S. Old River Dr, Lake Oswego
Charles A. Sams	19970 S. Old River Dr. Lake Oswego
Constance K. Sams	19970 S. Old River Dr. L. Oswego
David W Dodds	18931 S. OLD RIVER DRIVE, LAKE OSWEGO
Irene M. Dodds	18931 S. Old River Dr. Lake Oswego
J. H. Porter	19136 S. Old River Dr. Lake Oswego,
Joan K. Porter	19136 S Old River Dr. L. Oswego,

17

NAME	ADDRESS
R. H. Chinchen	18819 S. Millhill Dr.
Helen Chinchen	" " " "
Sharon Becker	18777 S. Millhill Dr.
Gary Rothgeb with exception of no. 8.	19735 S. Millhill Dr.
Laddie McDermott	19767 S. Midhill Dr.
Barbara M Kreiland	18250 S Pac. Hwy.
Boyd Kessore	18350 S. Pacific Hwy except #8

7



CITY OF LAKE OSWEGO
PCU-13-67

LOCATION: SEC. 24 T.2S. R.1E.
GEO. WALLING D.L.C.
SCALE: 1"=400'

FILE COPY

RECOMMENDATION

FILE NUMBER: PCU-13-67

APPLICANT: City of Lake Oswego

STAFF RECOMMENDATION: The Staff recommendation is to deny this application.

BASIS: The proposal is for a plant to treat water taken from the Willamette River, presumably for use in the City water system. It is a three-story building proposed in an area of single family dwellings on small-to-medium sized lots. A water treatment plant seems to be an incompatible use in this area which would lower property values of the existing property owners and preclude any further development. The possibility exists, in uses of this type, of objectionable noise and odor.

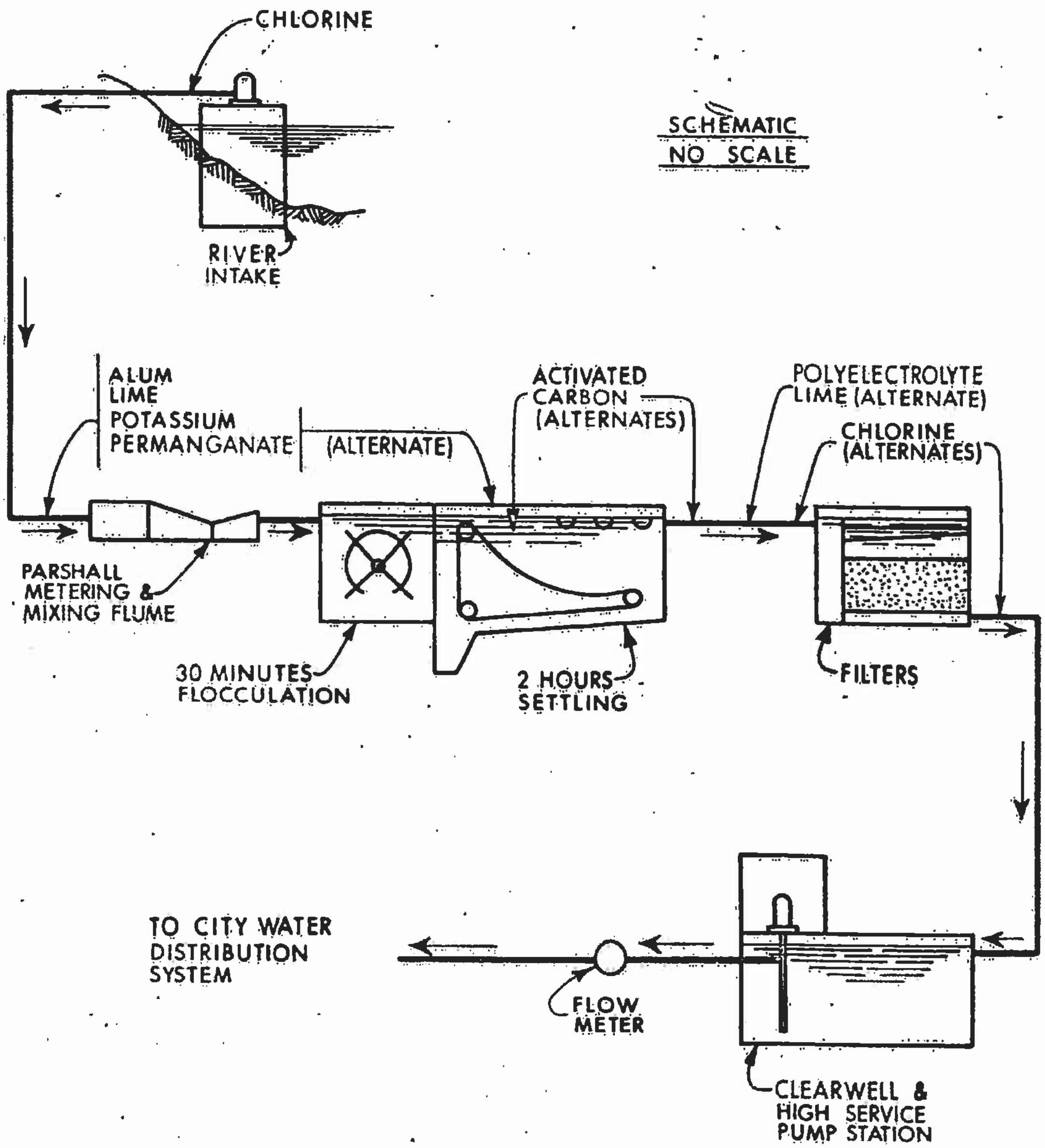


EXHIBIT "D"

FIGURE 1

CITY OF LAKE OSWEGO, OREGON

WATER TREATMENT PLANT FLOW DIAGRAM

CORNELL, HOWLAND, HAYES & MERRYFIELD
SEATTLE PORTLAND CORVALLIS BOISE

3938

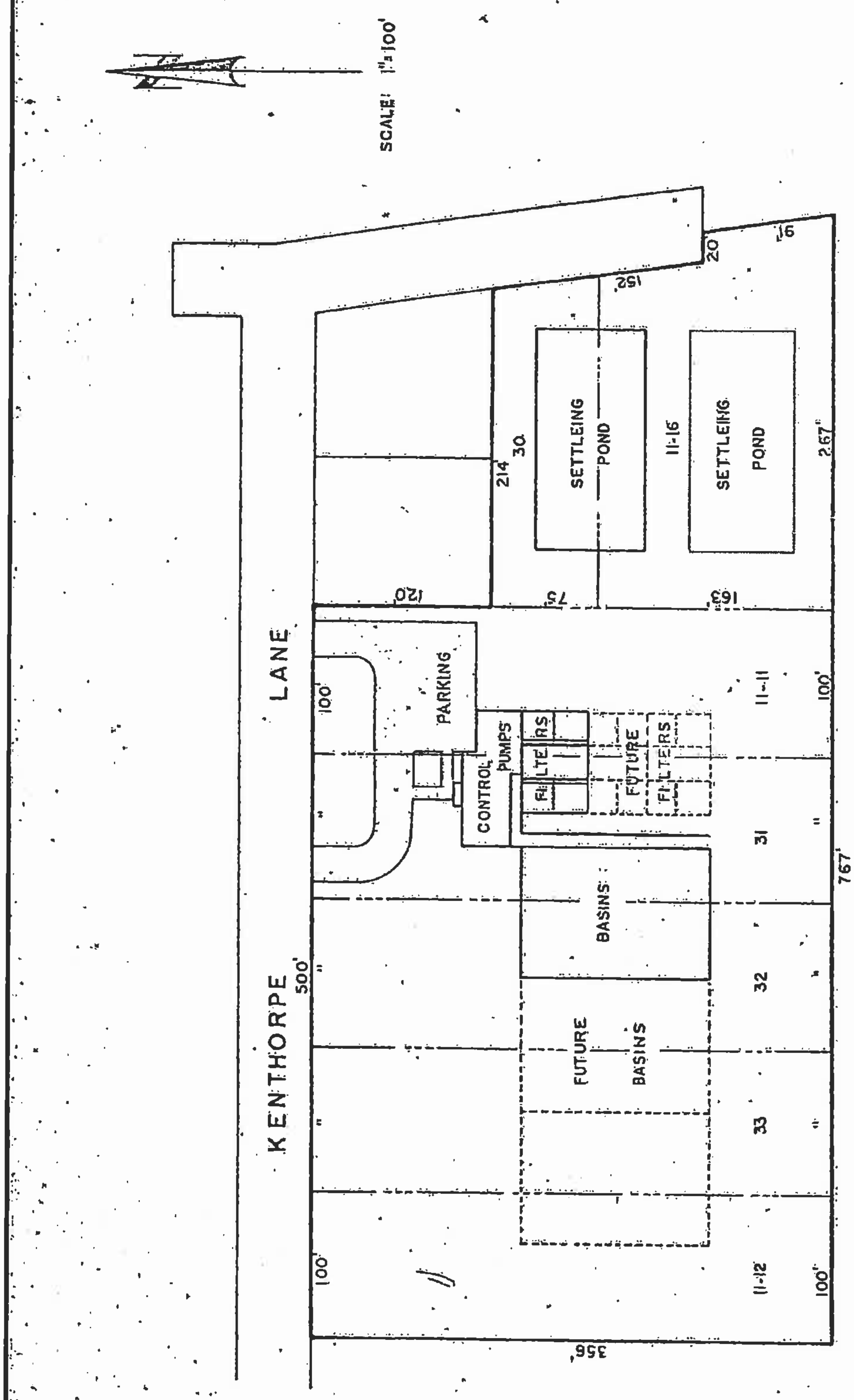


EXHIBIT "B"

CITY OF LAKE OSWEGO, ORE.
WATER TREATMENT PLANT
SITE PLAN

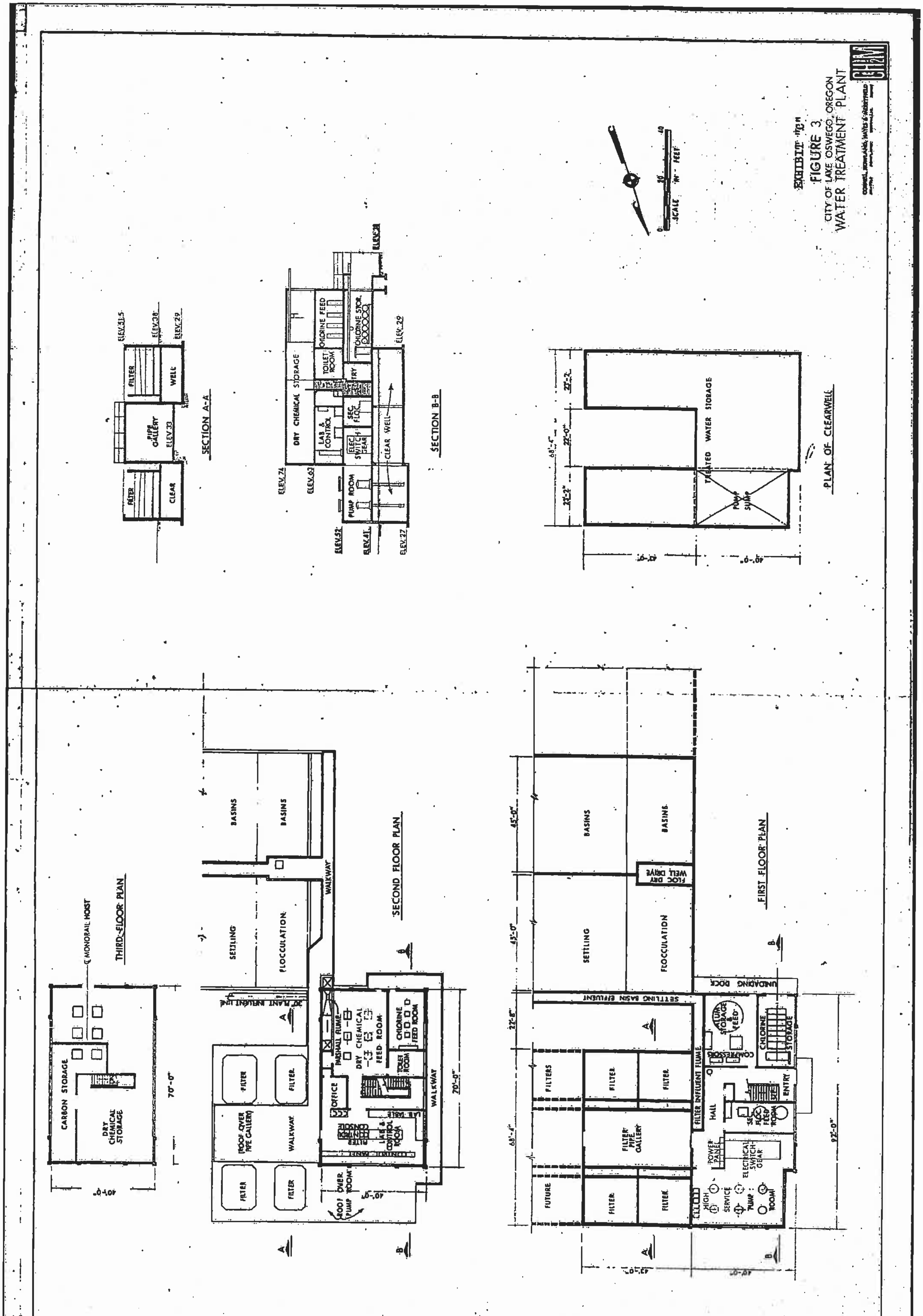


FIGURE 3
CITY OF LAKE OSWEGO, OREGON
WATER TREATMENT PLANT
CH2M
SCALE IN FEET
SECTION A-A
SECTION B-B
PLAN OF CLEARWELL
THIRD FLOOR PLAN
SECOND FLOOR PLAN
FIRST FLOOR PLAN
CARBON STORAGE
DRY CHEMICAL STORAGE
MONORAIL HOIST
SETTLING
FLOCCULATION
BASINS
WALKWAY
FILTER
FILTERS
FUTURE
FILTER PIPE GALLERY
ROOF OVER PIPE GALLERY
ROOF OVER PUMP ROOM
DRY CHEMICAL FEED ROOM
CHLORINE FEED ROOM
LAB & CONTROL ROOM
OFFICE
TOILET ROOM
PARSHALL FLUME
FILTER INFLUENT FLUME
SETTLING BASIN EFFLUENT
UNLOADING DOCK
FLOC DRY WELL DRIVE
ALUM STORAGE & FEED
CHLORINE STORAGE
COMPRESSORS
ENTRY
HALL
POWER PANEL
ELECTRICAL SWITCH GEAR
HIGH SERVICE PUMP ROOM
TREATED WATER STORAGE
PUMP SUMP
PIPE GALLERY
CLEAR WELL
PUMP ROOM
DRY CHEMICAL STORAGE
CHLORINE FEED
CHLORINE STOR.
ELEC SWITCH GEAR
SEC FLOC
ELEV 74
ELEV 63
ELEV 52
ELEV 41
ELEV 27
ELEV 29
ELEV 38
ELEV 33
70'-0"
92'-0"
68'-4"
45'-0"

All applications must be filed twenty-one (21) days prior to the regular hearings of the Clackamas County Planning Commission.

CLACKAMAS COUNTY, OREGON
PLANNING COMMISSION

M

No. CU— PCU-13-67

DATE OF APPLICATION: 2-6-67

REC. NO. PC— 1426 Fee: 25.00

DATE OF HEARING: 2-27-67

STAFF MEMBER: [signature]

DEVELOPMENT PATTERN RESIDENTIAL

APPLICATION FOR

CONDITIONAL USE

A. PRESENT ZONE: R-10, SFRD

B. PROPOSED USE: WATER TREATMENT PLANT

C. Name of Applicant: City of Lake Oswego, Oregon Phone: 636-8495

Address: City Hall, 40 "A" Avenue, Lake Oswego, Oregon 97034

Legal Owner: ( ) Contract Buyer: ( ) Option Holder: ( ) Agent: ( )

D. Who holds the Title to the property? See Exhibit "A"

Name Address

If You do not hold the Title to the Property, what is your interest? City negotiating for acquisition of land

E. Number and Street Kenthorpe Lane Between Old River Rd. and Easterly Terminus of Kenthorpe

F. Tax Lot 11-11; 11-12; 11-16; 30; 31; 32; 33; Section 24 T 2 South R 1 East DLC Geo. Walling DLC

Lot ----- Block ----- Addition ------

G. Size of Lot is ____ x See Exhibit B Total Area: 5.4 Acres

ALL CONTIGUOUS PROPERTIES UNDER SAME OWNERSHIP:

Tax Lot --- Section - T -- R --- DLC -----

Lot ----- Block -------- Addition ---------

Size of Lot is ------- x ---------- Total Area: -----------

H. State in detail specific conditional use requested: (If necessary, attach additional pages.) Requesting conditional use for the construction operation and maintenance of a Municipal Water Treatment Plant

Type, Size and Use of all proposed structures: See Exhibits "B" through [illegible]

Total number of People to use water and Sanitary Facilities: 3 persons

Square feet of Drainage area available: See Exhibit "B"

Parking Provisions—Square Feet available: See Exhibit "B"

Future Expansion Plans: See Exhibit "B"

Type, Size, Use and Disposition of all Existing Structures; (Indicate on plot plan Structures to remain.) None

I certify that the above information is true and accurate to the best of my knowledge. City of Lake Oswego

2/6/67
Date

[signature]
Signature of Applicant City Manager

PC FORM 1 1-66

(DO NOT WRITE IN SPACE BELOW)
(FOR HEALTH DEPARTMENT USE ONLY)

County Health Department recommendation: Conditional approval based on health Dept Plumbing Code Requirements

Approved (✓) Denied ( ) By: MW Murphy R.S.

APPROVED 2-21-67

Pelz, Zach

From: Scott Gerber [jumpin@cmn.net]
Sent: Tuesday, October 23, 2012 9:55 AM
To: Pelz, Zach; planningcommission@westlinnoregon.gov; Jordan, Chris; Sonnen, John
Subject: CUP COMMENT
Attachments: Air quality.docx

Mr. Pelz
Please submit the attached document to the Planning Commission for the CUP hearing on LOTWTP and Pipeline on Oct 25. It is obviously time sensitive, so I would appreciate confirmation of receipt and its being delivered to the commission.
Thank you
Scott Gerber
3940 Kenthorpe Way West Linn

PLEASE READ PRIOR TO OCT 25 MEETING

This letter is to comment on Lake Oswego-Tigard Water Partnership Water Treatment Plant (CUP-12-02/DR-12-04) and Water Transmission Pipeline (CUP-12-04/DR-12-14/MISC-12-10/WA-12-03/WR-12-01)

I would like to address the issue of air quality degradation as relates to this project. This is a subject that has not been adequately considered in previous comments, and it is one that deserves close attention.

I have reviewed the various figures and charts put forth by LOT regarding number of truck trips related to the two combined permit applications. Using conservative estimates based on LOT's figures, there will be at least 89000 HDDV (heavy duty diesel vehicle) trips associated with this project. These will be combined into trips going either direction on 43 as well as up and down Kenthorpe and Mapleton. Peak days will result in nearly 200 of these trips per day, and if workforce trips are added to this the peak daily number rises to 280.

CDC 60.07 A (7) states in relation to conditional use permits: "The use will comply with the applicable policies of the Comprehensive Plan".

Goal 6 of the Comprehensive Plan : Air, Water, and Land Resources Quality

"The quality of the area's air, water, and land resources have a considerable impact on overall livability. Only through careful preservation and management of these resources will West Linn assure a healthy environment for all its residents."

In Section 1: Air Quality it states, "The primary source of air pollution within the City of West Linn is automobile and truck emissions. At this time there are no known major single point sources of air pollution in the City. However, it is important to be aware of existing or future industrial facilities, which could be major point sources."

The Goal under this heading is "Maintain or improve West Linn's air quality."

The average HDDV emits 15 to 20 times the number of particles per mass unit of fuel than the average light duty vehicle. It would appear very obvious that 89000 or more additional dump trucks in our neighborhoods and on our main thoroughfare will put a serious crimp in this goal. In fact, all of these trips combined with the additional work force trips will no doubt seriously degrade the quality of West Linn's air. I would also add here the volumes of additional dust created by this traffic during the dry summer months. And there would have to be included what I am assuming to be diesel powered machines that will dig the holes for the 1000 pilings.

It would seem to me that Staff has committed a serious oversight when it addresses Goal 6 of the Comprehensive Plan. Staff reports findings related to Water and Land Quality, but nowhere is "Section 1: Air Quality" mentioned.

The addition of this truck and equipment traffic to our city will undeniably have a huge impact on the quality of our air, and Staff has blatantly ignored the issue altogether.

This project is in serious violation of this goal and I would suggest also violates CDC 60.090A (3) as it refers to reconstruction of roads.

"Project design minimizes environmental impacts to identified wetlands, wildlife habitat, AIR, water quality, cultural resources, and scenic qualities, and a site with fewer environmental impacts is not reasonably available."

As has been stated many times, LOT has refused to consider an alternative site, so would appear to be in violation here as well.

All of this is yet more evidence that these permit applications should be denied. In CDC 60.060 D (1) it refers to the burden of proof being on the applicant. If the Planning Commission should approve this project, that burden would shift to the citizenry as the process moves forward. That would be blatantly wrong, as this is but another example where the LOT project not only does not meet requirements, but will also do additional damage to our city and way of life.

Scott Gerber

3940 Kenthorpe Way, West Linn, OR

Pelz, Zach

From: Jack and Karlene [jnorb@comcast.net]
Sent: Tuesday, October 23, 2012 9:26 AM
To: Pelz, Zach
Subject: Re: Lake Oswego-Tigard Water Partnership amended application CUP-12-02/DR-12-04
Attachments: imagebdc9c3.gif@d170d345.57894b2f; LO PFO S-32410.pdf

Good morning Zach,
The lawyer for LOTWP made the point that Stafford isn't in their plans. This is a blatant lie as evidenced by their most recent renewal of their water rights permit in 2007. If you look on pages 4, 5 and 6 you will see references to building and servicing Stafford. This is against city goal #9 and their permit should be denied for this reason and many more. Apparently they thought that no one would look up their permit and their lie would go undetected. I am attaching it and want it in the public record.
Thank you
Jack Norby

From: "Zach Pelz" <ZPELZ@westlinnoregon.gov>
To: "Zach Pelz" <ZPELZ@westlinnoregon.gov>
Cc: "Shauna Shroyer" <SShroyer@westlinnoregon.gov>, "Peter Spir" <Pspir@westlinnoregon.gov>, "John Sonnen" <JSONNEN@westlinnoregon.gov>, "Kirsten Wyatt" <kwyatt@westlinnoregon.gov>, "Jane Heisler" <jheisler@ci.oswego.or.us>
Sent: Tuesday, August 21, 2012 2:47:36 PM
Subject: Lake Oswego-Tigard Water Partnership amended application CUP-12-02/DR-12-04

Good afternoon,

The Lake Oswego-Tigard Water Partnership submitted revisions to their Water Treatment Plant application yesterday. The full file can be accessed on the City's website here. The amended Water Treatment Plant application documents begin with the prefix ***8/20/12 Amendment -** * and are near the bottom of the project page.

The introduction to the narrative in Section 4 summarizes the changes and explains how these changes are presented throughout the various application materials.

Please feel free to call or email with questions.

Thanks,

Zach

CITY OF West Linn

Zach Pelz, AICP
ZPELZ@westlinnoregon.gov
Associate Planner
22500 Salamo Rd.
West Linn, OR 97068
P: (503) 723-2542
F: (503) 656-4106
Web: westlinnoregon.gov

Oregon Water Resources Department
Water Rights Division

Application for Extension of Time

In the Matter of the Application for an Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) Water Right Application S-43365, in the name of the City of Lake Oswego	))))	PROPOSED FINAL ORDER

Permit Information

<u>Application File S-43365 / Permit S-32410 (modified by Permit Amendment T-8538)</u>
Basin 02 –Willamette Basin / Watermaster District 20
Date of Priority: March 14, 1967

<u>Authorized Use of Water</u>

Source of Water: Clackamas River
Purpose or Use: Municipal
Maximum Rate: 50.0 Cubic Feet per Second

This Extension of Time request is being processed in accordance with Oregon Administrative Rule Chapter 690, Division 315.

Please read this Proposed Final Order in its entirety as it contains additional conditions not included in the original permit.

This Proposed Final Order applies only to Permit S-32410 (modified by Permit Amendment T-8538), water right Application S-43365. Copies of Permit S-32410 and Permit Amendment T-8538 (Special Order Volume 54, Page 677) are enclosed as Attachment 1.

Summary of Proposed Final Order for Extension of Time

The Department proposes to:

- grant an extension of time to complete construction of the water system from October 1, 2000 to October 1, 2040;
- grant an extension of time to apply water to full beneficial use from October 1, 2000 to October 1, 2040; and
- make the extension of time subject to certain conditions as set forth below.

ACRONYM QUICK REFERENCE

Department – Oregon Department of Water Resources
City – City of Lake Oswego
CRBC – Clackamas River Basin Council
CRWP – Clackamas River Water Providers
CWMG – Clackamas Watershed Management Group
draft WMCP – City of Lake Oswego's draft 2007 Water Management and Conservation Plan
ODFW – Oregon Department of Fish and Wildlife
PFO – Proposed Final Order
POD – Point of Diversion
USB – Urban Service Boundary
WBS – Water Environment Services
WMCP – Water Management and Conservation Plan

Units of Measure
cfs – cubic feet per second
gpm – gallons per minute

AUTHORITY

Generally, see ORS 537.230 and OAR Chapter 690 Division 315.

ORS 537.230(2) provides in pertinent part that the Oregon Water Resources Department (Department) may, for good cause shown, order and allow an extension to complete construction or perfect a water right. In determining the extension, the Department shall give due weight to the considerations described under ORS 539.010(5) and to whether other governmental requirements relating to the project have significantly delayed completion of construction or perfection of the right.

ORS 539.010(5) provides in pertinent part that the Water Resources Director, for good cause shown, may extend the time within which the full amount of the water appropriated shall be applied to a beneficial use. This statute instructs the Director to consider: the cost of the appropriation and application of the water to a beneficial purpose; the good faith of the appropriator; the market for water or power to be supplied; the present demands therefore; and the income or use that may be required to provide fair and reasonable returns upon the investment.

OAR 690-315-0080 provides in pertinent part that the Department shall make findings to determine if an extension of time for municipal and/or quasi-municipal water use permit holders may be approved to complete construction and/or apply water to full beneficial use. Under specific circumstances, the Department may condition extensions of time for municipal water use permit holders if use of the undeveloped portion of the permit will not maintain the persistence of listed fish species in the portions of the waterways affected by water use under the permit.

OAR 690-315-0090(3) authorizes the Department, under specific circumstances, to condition an extension of time for municipal and/or quasi-municipal water use permit holders to provide that diversion of water beyond the maximum rate diverted under the permit or previous extension(s) shall only be authorized upon issuance of a final order approving a Water Management and Conservation Plan under OAR Chapter 690, Division 86.

FINDINGS OF FACT

Background

1. Permit S-32410 was granted by the Department on October 19, 1967. The permit authorizes the use of water up to 50.0 cfs from the Clackamas River, a tributary of the Willamette River, for municipal use. It specified that construction of the water development project should be completed by October 1, 1969, and that complete application of water was to be made on or before October 1, 1970.

2. On September 11, 2000 the Department approved Permit Amendment T-8257 (Special Order Volume 54, Page 677) authorizing a change in place of use to include, in addition to the City of Lake Oswego, the Cities of Tigard and Tualatin.

3. On November 14, 2001 the Department issued Certificate 78332 to confirm the incremental perfection of Permit S-32410 for 25.0 cfs of water.

4. Five prior permit extensions have been granted for Permit S-32410 (modified by Permit Amendment T-8538). The most recent extension request resulted in the completion dates for construction and full application of water being extended to October 1, 2000.

5. Due to an ongoing permit extension rulemaking, the Department placed all pending Applications for Extension of Time for municipal and quasi-municipal permits on hold and did not require municipal and quasi-municipal water use permit holders to submit Applications for Extension of Time until the new rules were adopted.

6. Municipal and quasi-municipal water use permit extension rules OAR 690-315-0070 through 690-315-0100 became effective on November 1, 2002, were amended, filed with the Secretary of State, and became effective on November 22, 2005.

7. The permit holder, the City of Lake Oswego (City) submitted a $100.00 application fee and an "Application for Extension of Time" to the Department on July 1, 2003, requesting the time to complete construction of the water system and apply water to full beneficial use be extended

from October 1, 2000 to October 1, 2040.

8. Notification of the City's Application for Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) was published in the Department's Public Notice dated July 29, 2003. No public comments were received regarding the extension application.

9. On April 18, 2005, January 17, 2006, November 7, 2006, and May 15, 2007, the City submitted additional information to supplement their Application for Extension of Time.

<u>Review Criteria for Municipal and Quasi-Municipal Water Use Permits [OAR 690-315-0080(1)]</u>
The time limits to complete construction and/or apply water to full beneficial use may be extended if the Department finds that the permit holder has met the requirements set forth under OAR 690-315-0080(1). This determination shall consider the applicable requirements of ORS 537.230[1], 537.248[2], 537.630[3] and/or 539.010(5)[4].

<u>Complete Extension of Time Application [OAR 690-315-0080(1)(a)]</u>

10. On July 1, 2003, the Department received a completed Application for Extension of Time and the fee required by ORS 536.050 from the permit holder.

<u>Start of Construction [OAR 690-315-0080(1)(b)]</u>

11. Surface water permits held by municipal corporations for municipal purposes or uses are not subject to the requirement to begin actual construction work within one year from the date of approval of the application[5].

<u>Duration of Extension [OAR 690-315-0080(1)(c), (d)]</u>
Under OAR 690-315-0080(1)(c), (d), in order to approve an extension of time for municipal and quasi-municipal water use permits the Department must find that the time requested is reasonable and the applicant can complete the project within the time requested.

12. The remaining work to be accomplished under Permit S-32410 (modified by Permit Amendment T-8538) consists of (1) planning for provision to expand municipal services into the Stafford Urban Reserve Area, (2) upsizing and expansion of raw and treated water pumping and conveyance systems and treatment, (3) sizing raw and finished water piping to convey 59 cfs of water, (4) construction of distribution systems including pump stations, reservoirs, and

---

[1] ORS 537.230 applies to surface water permits only.

[2] ORS 537.248 applies to reservoir permits only.

[3] ORS 537.630 applies to ground water permits only.

[4] ORS 537.010(5) applies to surface water and ground water permits

[5] Section 5, chapter 410, Oregon Laws 2005, provides:

Sec. 5. (2) The amendments to ORS 537.230 and 537.630 by sections 1 and 2 of this 2005 Act apply to requests for extensions of time to complete construction or to perfect a water right made before, on or after the effective date of this 2005 Act, whether or not construction has commenced under a permit prior to the request.

transmission mains to Stafford area, (5) possible expansion of raw and treated water pumping capacity, and (6) completing construction of the water system and applying water to full beneficial use.

13. As of July 1, 2003, the permit holder has diverted the 25.0 cfs of the 50.0 cfs of water allowed under Permit S-32410 (modified by Permit Amendment T-8538 for municipal purposes; the City received confirmation of the incremental perfection for this 25.0 cfs by Certificate 78332. None the remaining 25.0 cfs of water under Permit S-32410 has been diverted.

14. In addition to the 50.0 cfs of water allowed under Permit S-32410 (modified by Permit Amendment T-8538) from the Clackamas River, the City holds the following rights:

- Permit S-37839 for 9.0 cfs of water from the Clackamas River, tributary of the Willamette River;
- Permit S-43246 for 6.0 cfs of water from the Willamette River, tributary of the Columbia River;
- Groundwater Registration GR-3819 for 0.78 cfs from Well 2;
- Groundwater Registration GR-3820 for 0.98 cfs from Well 4; and
- Groundwater Registration GR-3821 for 0.78 cfs from Well 3.

15. The City's municipal water rights total 67.54 cfs, being 65.0 cfs of live flow (surface) water, and 2.54 cfs of ground water. According to the City, the 2.54 cfs of ground water is not being utilized at this time. Wells 3 and 4 have been abandoned, and water from Well 2 (GR-3819) is only used sparingly in the hottest part of dry summers to meet peak demands. The City has not yet made use of 34.0 cfs of water from the Clackamas River, being 9.0 cfs of water under Permit S- 37839 and 25.0 cfs of water under Permit S-32410 (modified by Permit Amendment T-8538). The City has not yet made use of 6.0 cfs of water from the Willamette River under Permit S-43246. The City's current system supply capacity is limited by the production of its water treatment facility, which is approximately 24.8 cfs.

16. The City currently serves retail customers within the City of Lake Oswego city limits ("City only"), and residents of water districts outside of the city limits, but within the Urban Service Boundary (USB). The City has agreements to provide water to the Lake Grove Water District, Skylands Water Company, Glenmorrie Water Company, and the cities of Tigard and Portland/Arrowood/Alto Park. The City also maintains emergency interties with the cities of West Linn/South Fork Water Board and Tualatin, and the Rivergrove Water District. A 925-acre developable area called the Stafford Triangle located south of the USB is not currently served by the City, but is expected to be included in the City's service area prior to 2030.

17. The City has agreed to begin supplying up to 3.9 cfs of surplus water to the City of Tigard beginning in June 2007 under the terms of an existing intergovernmental agreement.

18. According to the Lake Oswego's 2007 draft Water Management and Conservation Plan (draft WMCP) (Exhibit 5-4, Page 5-5), the City's maximum day demand is approximately 25 cfs.

19. According to the City's draft WMCP, in 2005 (Exhibit 5-3, Page 5-4), the service population within the city limits of the City of Lake Oswego ("City only") was estimated at 33,278 and is projected to grow at an annual rate of less than 0.5 percent, reaching an estimated service population of 37,697 by the year 2030. In 2005, the service population of residents within water districts outside of the city limits, but within the Urban Service Boundary was estimated at 6,543 and is expected to grow at an annual rate of 1.69 percent, reaching an estimated service population of 9,578 by the year 2030. Thus, the service population within the City's entire Urban Service Boundary (USB) is estimated at 47,275 by the year 2030. The USB service population is estimated to be 54,098 at build-out. The current population of the Stafford Triangle is estimated at 1,707 and is projected to yield a population of 2,595 in 2030.

20. According to the Lake Oswego's 2007 draft Water Management and Conservation Plan (draft WMCP) (Exhibit 5-4, Page 5-5), the City's maximum day demand (including Stafford Triangle) will be 30 cfs in 2030, and will reach approximately 37 cfs at build-out.

21. In November 2006, the City completed a Joint Water Supply System Analysis with the City of Tigard; the analysis concludes significant benefits are derived for each city by partnering for future supply development. According to the City, the timing of utilizing the undeveloped portion of Permit G-37839 is driven by Lake Oswego's current demand patterns and forecasted growth, and Tigard's objective of securing access to a firm source of water supply by 2016. According to the City's draft WMCP (Page 5-7), a service to Tigard of 20.6 cfs of water during maximum day demand periods will result in full use of the City's 50 cfs under this permit, but once the City reaches its projected build-out of 37.0 cfs, Tigard could be limited to 22.1 cfs based on the City's total Clackamas River water rights of 59.0 cfs.

22. The City has requested to reserve 9 cfs for potential sale to the City of Tualatin in absence of continuing to supply of water to the City of Tigard; a modest expansion of an existing intertie would allow the City to supply water to the City of Tualatin.

23. Therefore, considering the water rights held by the City full development the 50 cfs under Permit S-32410 (modified by Permit Amendment T-8538) is necessary to address the present and future water demands of the City, as well as helping to meet supplemental and future regional water demands.

24. The City's request for an extension of time until October 1, 2040 to complete construction of the water system and to apply water to full beneficial use under the terms of Permit S-32410 (modified by Permit Amendment T-8538) is both reasonable and necessary, considering findings in this PFO, including:

- the amount of development left to occur,
- the reliability of the other water rights held by the City,
- the City's projected annual growth rate within its USB,
- the City's commitment to supply surplus water to other entities through intergovernmental agreements,
- the potential for the City to enter into a water supply agreement with the City of Tigard

or the City of Tualatin, and

- the potential for the reliance of other entities on the City to meet their present and projected demands for water.

<u>Good Cause [OAR 690-315-0080(1)(e) and (3)(a-g)]</u>
The Department's determination of good cause shall consider the requirements set forth under OAR 690-315-0080(3).

<u>Reasonable Diligence and Good Faith of the Appropriator OAR 690-315-0080(3)(a),(c) and (4)]</u>
Reasonable diligence and good faith of the appropriator must be demonstrated during the permit period or prior extension period as a part of evaluating good cause in determining whether or not to grant an extension. In determining the reasonable diligence and good faith of a municipal or quasi-municipal water use permit holder, the Department shall consider activities associated with the development of the right including, but not limited to, the items set forth under OAR 690-315-0080(4) and shall evaluate how well the applicant met the conditions of the permit or conditions of a prior extension period.

25. During the most recent extension period under Permit S-32410 (modified by Permit Amendment T-8538), being from October 1, 1995 to October 1, 2000, the following work was accomplished by the City:

- supplied the City of Tigard an annual average daily basis of 2.5 cfs of water,
- enacted Ordinance 2142 authorizing membership in the Region Water Providers Consortium and endorsing the Region Water Supply Plan,
- funded the development of a Water Treatment Plant Facilities Plan evaluating plant needs through the year 2050 including build-out needs supporting potential water supply to both the City and the City of Tigard,
- active participant in the Clackamas River Basin Council (CRBC) and adopted Resolution R97-33 authorizing the joint funding of a staff support position to the CRBC,
- along with NCCWC, CRW, SFWB, the Cities of Estacada and Milwaukie, Water Environment Services, Portland General Electric, and the Clackamas River Basin Council, formed the Clackamas Watershed Management Group (CWMG) which supports research and projects designed to benefit the Clackamas River,
- adopted Resolution R98-50 authorizing the City's participation with other Clackamas River Water Providers (CRWP), in the joint development and use of the Clackamas River, which encompasses water quality monitoring, watershed assessments, sanitary surveys and public outreach,
- completed construction of a 5-MG water storage reservoir,
- issued $7.82 million of water revenue bonds to fund design and construction of two new water storage reservoirs, upgrades to the City's water treatment plant, intake facility, and raw and finished water transmission mains,
- supplied the City of Tualatin over 30 cfs of water in December of 1999 when their primary supply from Bull Run Reservoir was temporarily discontinued due to high

turbidity conditions,

- completed construction of an impressed current cathodic protection system for the raw and treated water transmission pipelines,
- completed construction of a 4-MG water storage reservoir, and
- received a final order for permit amendment T-8538 authorizing a change in place of use to include the Cities of Tigard and Tualatin.

26. Since October 1, 2000, the following work has been accomplished:

- entered into an intergovernmental agreement with the City of West Linn and South Fork Water Board to jointly fund design and construction of a water system intertie,
- provided 4.95 cfs of water daily to the City of West Linn January 1 to April 2001,
- completed a January 2001 Water Master Plan update,
- completed construction of seismic upgrades to the City's water treatment plant,
- completed a Biological Assessment for the City of Lake Oswego Clackamas River Water Intake Modifications (MWH, 2002),
- received a Biological Opinion for the Lake Oswego Water Intake, prepared by the National Marine Fisheries Service (NOAA/NMFS, 2002/00556),
- completed a Joint Water Supply Agreement Analysis with the City of Tigard,
- as a member of CWMG, funded monitoring, sampling studies, and support of the Clackamas River Basin Council (CRBC) between 2000 and 2004, and thereafter funded a modeling project for future demands and pesticide studies with the USGS, worked with the CRBC on the Clackamas Watershed Assessments and Action Plan, and monitored for water quality and stream flows,
- as a member of CWMG, partnered with the United States Geological Survey (USGS) to complete two studies regarding pesticide levels in the lower Clackamas Basin,
- as a member of CWMG, partnered with the United States Geological Survey (USGS) to complete a Water Quality and Algal Conditions Study, and
- completed a draft 2007 Water Management and Conservation Plan.

27. As of July 1, 2003, the permit holder invested $2.4 million, which is approximately 7 percent of the total projected cost for complete development of this project. The City anticipates an additional investment up to $34 million for the completion of this project.

28. Since the issuance of Permit S-32410 (modified by Permit Amendment T-8538) on October 19, 1967, the permit holder has diverted the 25.0 cfs of the 50.0 cfs of water allowed under Permit S-32410 (modified by Permit Amendment T-8538); the City received confirmation of the incremental perfection for this 25.0 cfs by Certificate 78332.

29. The Department has considered the City's compliance with conditions, and did not identify any concerns.

30. Even further diligence and good faith has been shown by the City in connection with the Clackamas River Water Providers (CRWP) to preserve minimum in-stream flows and enhance in-stream flows within the Clackamas River.

   a. In 1996 Clackamas River Water negotiated a Storage Capacity Agreement with Portland General Electric (PGE) for water storage capacity and water releases from Timothy Lake for stream flow augmentation. In 2006, the agreement with PGE was extended through the duration of the hydroelectric relicensing proceedings for PGE's Clackamas River Hydroelectric Project and also added the Clackamas River Water Providers to the agreement. CRWP members are City of Lake Oswego, South Fork Water Board, North Clackamas County Water Commission (Oaklodge Water District, Sunrise Water Authority and City of Gladstone) and Clackamas River Water. According to the 2006 agreement with PGE, upon issuance of the new FERC license, a new Storage Capacity Agreement between PGE and CRWP will be approved. Under the current agreement with PGE, the CRWP can call on the release of 2,200 acre-feet of stored water from June 15 to Labor Day, and 9,100 acre-feet from Labor Day to June. The storage releases are associated with minimum and maximum release rates.

   b. In 2006, CRWP entered into an Intergovernmental Agreement for the use of stored water from Timothy Lake under the PGE agreement. Under this Intergovernmental Agreement, the decision for the CRWP to call for the release of stored water will be made to satisfy two purposes (1) preserve minimum instream flows, and (2) to enhance instream flows. (*See* SUPPLEMENTAL PERMIT EXTENSION MATERIAL, November 2006)

31. The City has demonstrated good faith and reasonable diligence in previous performance under Permit S-32410 (modified by Permit Amendment T-8538).

Financial Investment and Cost to Appropriate and Apply Water to a Beneficial Purpose [OAR 690-315-0080(3)(b)]

32. As of July 1, 2003, the permit holder invested $2.4 million, which is approximately 7 percent of the total projected cost for complete development of this project. The City anticipates an additional investment up to $34 million for the completion of this project.

The Market and Present Demands for Water [OAR 690-315-0080(3)(d)]

33. As described in Findings 13 through 23 above, the City has indicated, and the Department finds that the City must rely on full development of Permit S-32410 (modified by Permit Amendment T-8538).

34. Given the current water supply situation of the City, its intergovernmental agreements with other entities, estimates of build out, and as well as current and future, primary and emergency water demands (including regional demands), there is a market and present demand for the water to be supplied under Permit S-32410 (modified by Permit Amendment T-8538).

35. In accordance with OAR 690-315-0090(3), and as specified under Item 1 (Development Limitations) of the "Conditions" section of this PFO, the Department has determined that this extension shall be conditioned to provide that the diversion of water under Permit S-32410 (modified by Permit Amendment T-8538) beyond the 25.0 cfs confirmed in Certificate 78332 shall only be authorized upon issuance of a final order approving a WMCP.

Fair Return Upon Investment [OAR 690-315-0080(3)(e)]

36. Use and income from the permitted water development project will result in reasonable returns upon the investment made in the project to date.

Other Governmental Requirements [OAR 690-315-0080(3)(f)]

37. Delays caused by any other governmental requirements in the development of this project have not been identified.

Events which Delayed Development under the Permit [OAR 690-315-0080(3)(g)]

38. Delay of full beneficial use of water was due, in part, to the size and scope of the project, which includes potential partnerships with the Cities of Tigard or Tualatin, and wholesale contracts with other entities.

Maintaining the Persistence of Listed Fish Species [OAR 690-315-0080(1)(f) and (2)]

The Department's determination regarding maintaining the persistence of listed fish species shall be based on existing data and advice of the Oregon Department of Fish and Wildlife (ODFW). The determination shall be limited to impacts related to stream flow as a result of use of the undeveloped portion of the permit and further limited to where, as a result of use of the undeveloped portion of the permit, ODFW indicates that stream flow would be a limiting factor for the subject listed fish species.

39. The pending municipal Application for Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) was delivered to ODFW on November 9, 2006 for ODFW's review under OAR-690-315-0080.

40. Notification that the pending municipal Application for Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) was delivered to ODFW for review was sent to the City on November 9, 2006.

41. Notification that the pending municipal Application for Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) was delivered to ODFW for review was published in the Department's Public Notice dated November 21, 2006. No public comments were received regarding this notice.

42. The Application for Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) was placed on administrative hold on February 21, 2007 at the City's request, and was therefore withdrawn from review by ODFW.

43. The Application for Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) was taken off administrative hold on April 23, 2007 at the City's request, and the review by ODFW resumed.

44. On May 4, 2007 the Department received ODFW's Division 315 Fish Persistence Evaluation for Permit S-32410 (modified by Permit Amendment T-8538).

45. Notification as per OAR 690-315-0080(f)(2) of ODFW's written advice for the pending municipal Application for Extension of Time for Permit S-32410 (modified by Permit Amendment T-8538) was sent to the City May 9, 2007.

46. Summary and Excerpts of Advice from ODFW:

Generally

Use of water under the portion of this permit that was undeveloped as of the date of the extension final order should be conditioned to maintain persistence of listed fish species. ODFW's advice is based on the best available information and existing data and recommends the stream flows in Table 1, below, for maintaining the persistence of listed fish species. However, ODFW advises the Water Resources Department to develop conditions that allow municipalities to meet their water needs while maintaining the persistence of listed fish species. From the first Monday in September through June 30, the severity of the measures to be taken by the permit holders should reflect the amount by which the recommended flows are being missed and the percentage of water that is withdrawn by the municipality as compared to the overall streamflow level.

Table 1

SUMMARY OF ODFW'S RECOMMENDED MINIMUM FISH FLOW NEEDS ON THE LOWER CLACKAMAS RIVER - MEASURED AT USGS GAGE 14211010, CLACKAMAS RIVER NEAR OREGON CITY, OREGON	
Month	Cubic Feet per Second
June – August	650
September	650/800
October – May	800

April 1 through June 30

Flows in the river during this time of year are typically well over 1000 cfs and the level of municipal withdrawal is normally below capacity so there should not be instances where the stream flow is not meeting targets. However, if flows do not meet targets, the City of Lake Oswego (City) should develop a plan to provide for a contingency to reduce its water use.

July 1 until the first Monday in September

This time of year the stream flow does, on occasion, approach or miss fish persistence target flows. However, the water management agencies (Clackamas River Water Providers) have an intergovernmental agreement concerning the PGE Stored Water Agreement[6] to use 2200 acre feet (AF) of stored water released from Timothy Lake to augment stream flows between June 15 and Labor Day. The City in cooperation with other members of the Clackamas River Water Providers, and in cooperation with ODFW, should develop (and periodically update) a plan to trigger release of water from Timothy Lake to maximize flows during low flow conditions. If flows do not meet targets, the City should develop a plan to provide for a contingency to reduce its water use or augment stream flows using releases from Timothy Lake. Following are considerations for the Water Resources Department to consider in developing conditions for this permit and for the municipality to consider in the development of any plan to address short falls in stream flow levels.

- If targeted flow levels cannot be met, flow releases under agreement from Timothy Lake can be beneficial to stream flows and can offset some of the use by the municipalities. Consultation with ODFW is recommended to determine the annual priority for shaping the augmentation flows to best support fish persistence. A plan (in consultation with ODFW) should be developed that considers a flow regime that considers and balances flow augmentation to maintain inundation of winter steelhead redds in early July (through approximately July 15) and the maintenance of consistent flows throughout the remainder of the time period to maximize access to rearing habitat and avoid stranding of fish.
- The severity of the measures taken should be reflective of the available summer rearing habitat within the lower 3.1 miles of the Clackamas River where the diversions occur (which represents less than 2% of the total available rearing habitat) and is habitat that may be avoided by salmonids since the highest temperatures in the basin occur within this stream reach. Because the value of this rearing habitat is low relative to the rest of the basin rearing habitat, measures such as flow augmentation using stored water will offset much of the effect of diverting water out of stream. Additionally, flow augmentation would benefit streamflows and rearing habitat from Timothy Lake through the entire stream reach (23.3 miles) down to the lower 3.1 stream miles where water is withdrawn.

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[6] On July 1996, Clackamas River Water, Eugene Water and Electric Board, and Portland General Electric (PGE) entered into a STORAGE CAPACITY AGREEMENT concerning releases of storage water from Timothy Lake. On September 1, 2006, Clackamas River Water, South Fork Water Board, Sunrise Water Authority, North Clackamas County Water Commission, and the City of Lake Oswego (collectively referred to as the Clackamas River Water Providers, or CRWP) entered into an Intergovernmental Agreement, CLACKAMAS RIVER WATER PROVIDERS FOR COORDINATING USE OF STORED WATER FROM TIMOTHY LAKE CONCERNING THE 2006 PGE STORED WATER AGREEMENT, whereby the parties agree to coordinate water supply planning for beneficial use of the stored water from Timothy Lake under the Stored Water Agreement with PGE. On November 2, 2006, Portland General Electric and Clackamas River Water entered into an AMENDMENT AND EXTENSION OF STORAGE CAPACITY AGREEMENT whereby the parties acknowledge the desire of Clackamas River Water to coordinate the use of stored water with the Clackamas River Water Providers (CRWP) and agree that upon issuance of the new PGE FERC license that PGE and the CRWP will enter into a new storage capacity agreement concurrent with the term of that license period.

From the first Monday in September through November 30

The water management agencies (Clackamas River Water Providers) have an intergovernmental agreement concerning the PGE Stored Water Agreement to use 9100 AF of stored water released from Timothy Lake to augment stream flows between Labor Day and June 14. If flows do not meet targets after the first Monday in September, the City should develop a plan to provide for a plan to augment stream flows and reduce its water use to minimize its impact. Following are considerations for the Water Resources Department to consider in developing conditions for this permit and for the municipality to consider in the development of any plan to address short falls in stream flow levels.

- If targeted flow levels cannot be met, flow releases under agreement from Timothy Lake can be beneficial to stream flows and can offset some of the use by the municipalities. A main consideration for this time period is to balance flow augmentation to provide for increasing flows that once reached will not be reduced before fall rains arrive and stream flows naturally begin rising. A plan (in consultation with ODFW) should be developed that considers a flow regime that works best for fish spawning in the lower river that provides access to spawning areas and maintains water over those spawning areas until stream flows naturally increase in the fall.
- Relative to the summer flow season, the significance of the lower 3.1 miles in terms of habitat in the fall is more significant (especially for Fall Chinook) an is more important in maintaining persistence of listed and sensitive species.

From December 1 to March 31

ODFW does not anticipate flow related issues occurring with municipal withdrawals during this period of the year based on past gage data.

47. Department's Review of ODFW's Advice:

ODFW recommends target flows to be measured on the Lower Clackamas River (USGS Gage Number 14211010, Clackamas River near Oregon City, Oregon, or its equivalent). When the target flows are not met, ODFW recommends that some kind of action on the part of the water user be taken such as having a contingency to reduce access to the undeveloped portion of the permit. Consistent with this advice, OWRD is proposing conditions in this extension of time that will reduce the maximum total amount of the undeveloped portion of the permit that can legally be diverted when ODFW's recommended flow targets are not met. (See "Conditions to Maintain the Persistence of Listed Fish" specified under Item 2 of the "Conditions" section of this PFO).

ODFW's advice is contingent upon withdrawal of water from points of diversions located only within the lower 3.1 miles of the Clackamas River.

ODFW's advice acknowledges the Clackamas River Water Providers[7] intergovernmental

[7]ODFW actually referred the "Clackamas Watershed Management group (a consortium of all municipal water users on the Clackamas)" instead to the Clackamas River Water Providers. The Clackamas Watershed Management group is a joint funding organization made up of Clackamas River Water Providers and Water Environment Services; the Clackamas

agreement concerning the PGE Stored Water Agreement which allows for 2200 AF of stored water releases from Timothy Lake to augment stream flows between June 15 and Labor Day, and another 9100 AF for release from Labor Day to June 14.

48. The Department finds, based on ODFW's advice, that in the absence of conditions, the use of the undeveloped portion of Permit S-32410 (modified by Permit Amendment T-8538) will not maintain the persistence of listed fish species in the portions of the waterways affected by water use under the permit, and as a result of the use of the undeveloped portion of the permit, streamflow would be a limiting factor for the listed fish species.

49. Based on ODFW's advice, the Department proposes to require conditions to maintain, in the portions of the waterways affected by water use under Permit S-32410 (modified by Permit Amendment T-8538), the persistence of fish species listed as sensitive, threatened or endangered under state or federal law. (See Item 2 of the "Conditions" section of this PFO.)[8]

50. On November 5, 2007, ODFW notified the Department that the "Persistence of Fish Conditions" are consistent with their advice.

51. On November 9, 2007, the Department notified the City of the "Persistence of Fish Conditions" proposed in this PFO.

CONCLUSIONS OF LAW

1. The City is entitled to apply for an extension of time to complete construction and/or completely apply water to the full beneficial use pursuant to ORS 537.630(2).

2. The City has submitted a complete extension application form and the fee specified under ORS 536.050(1)(k), as required by OAR 690-315-0080(1)(a).

3. Pursuant to Section 5, Chapter 410, Oregon Laws 2005, the permit holder is not required to demonstrate that actual construction of the project began within one year of the date of issuance of the permit, as otherwise required by OAR 690-315-0080(1)(b).

4. The time requested to complete construction and apply water to full beneficial use is reasonable, as required by OAR 690-315-0080(1)(c).

5. Completion of construction and full application of water to beneficial use can be completed by October 1, 2040[9], as required by OAR 690-315-0080(1)(d).

Watershed Management group is not a party to this intergovernmental agreement.

[8] The Department, based on advice from the ODFW, has determined that the conditions contained in this PFO are appropriate for this extension. In other municipal extensions that require conditions to maintain the persistence of listed species, different conditions may be warranted depending on the advice received from ODFW and communications with the particular extension applicant.

[9] For permits applied for or received on or before July 9, 1987, upon complete development of the permit, you must notify

6. The Department has considered the reasonable diligence and good faith of the appropriator, the cost to appropriate and apply water to a beneficial purpose, the market and present demands for water to be supplied, the financial investment made and the fair return upon the investment, the requirements of other governmental agencies, and unforeseen events over which the water right permit holder had no control, and the Department has determined that the City has shown good cause for an extension of time to complete construction of the water system and to apply the water to full beneficial use pursuant to OAR 690-315-0080(1)(e).

7. In accordance with OAR 690-315-0090(3) and as described in Finding 35 above, the Department has established, as specified under Item 1 of the "Conditions" section of this PFO for an Extension of Time, that the diversion of water under Permit S-32410 (modified by Permit Amendment T-8538) beyond the 25.0 cfs confirmed in Certificate 78332 shall only be authorized upon issuance of a final order approving a WMCP under OAR Chapter 690, Division 86.

8. In accordance with OAR 690-315-0080(1)(f), and as described in Findings 46 through 49 above, in the absence of special conditions the persistence of listed fish species will not be maintained in the portions of the waterways affected by water use under this municipal use permit. Therefore, the diversion of water under Permit S-32410 (modified by Permit Amendment T-8538) beyond the 25.0 cfs confirmed in Certificate 78332 will be subject to the conditions specified under Item 2 of the "Conditions" section of this PFO.

Proposed Order

Based upon the foregoing Findings of Fact and Conclusions of Law, the Department proposes to issue an order to:

> extend the time to complete construction of the water system under Permit S-32410 from October 1, 2000 to October 1, 2040; and
>
> extend the time to apply the water to full beneficial use under Permit S-32410 from October 1, 2000 to October 1, 2040.

Subject to the following conditions:

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the Department that the work has been completed and either: (1) hire a water right examiner certified under ORS 537.798 to conduct a survey, the original to be submitted as required by the Department, for issuance of a water right certificate; or (2) continue to appropriate water under the water right permit until the Department conducts a survey and issues a water right certificate under ORS 537.625.

CONDITIONS

1. **Development Limitations**

Diversion of water under Permit S-32410 (modified by Permit Amendment T-8538) beyond the 25.0 cfs confirmed in Certificate 78332 shall only be authorized upon issuance of a final order approving a WMCP under OAR Chapter 690, Division 86. A WMCP shall be submitted to the Department within 3 years of an approved extension of time application. Use of water under Permit S-32410 (modified by Permit Amendment T-8538) shall be consistent with this and subsequent WMCP's approved under OAR Chapter 690, Division 86 on file with the Department.

The deadline established in this PFO for submittal of a WMCP shall not relieve a permit holder of any existing or future requirement for submittal of a WMCP at an earlier date as established through other orders of the Department. A WMCP submitted to meet the requirements of this order may also meet the WMCP submittal requirements of other Department orders.

2. **Conditions to Maintain the Persistence of Listed Fish**

a. Minimum fish flow needs on the Lower Clackamas River as recommended by ODFW are in Table 2, below, and are to be measured at USGS Gage Number 14211010, Clackamas River near Oregon City, Oregon, or its equivalent.

b. In cooperation with other members of the Clackamas River Water Providers, the City of Lake Oswego must have an annual meeting with ODFW to devise a strategy to maximize fishery benefits that can be derived from the agreement with PGE for the release of stored water from Timothy Lake. This is of particular significance when augmenting stream flow during the period of July 1 through November 30.

c. From the first Monday in September through June 30 the maximum total amount of the undeveloped portion of the Permit S-32410 (modified by Permit Amendment T-8538) that can legally be diverted shall be reduced in proportion to the amount by which the flows shown in Table 2 are not met based on a seven day rolling average of mean daily flows (measured on the Clackamas River at USGS Gage Number 14211010, Clackamas River near Oregon City, Oregon, or its equivalent), as illustrated in the examples below.

Example 1:

On June 15, the last seven mean daily flows were 750, 725, 700, 650, 625, 600 and 575 cfs. The seven day rolling average is 661 cfs. The maximum total amount of the undeveloped portion of the permit that could legally be diverted under this permit would not be reduced because the 7 day average of mean daily flows is greater than the 650 target flow for June 15.

Example 2:

If on June 15, the average of the last seven mean daily flows was 578 cfs, then the target flows would be missed by 11% (100 – [(578/650)* 100)]. If the maximum total amount of the undeveloped portion of the permit that can legally be diverted under this permit is 10 cfs, then the maximum total amount of the undeveloped portion of the permit that could be legally diverted under this permit would be reduced by 11%. The maximum total amount of the undeveloped portion of the permit that could be legally diverted under the permit under this condition would be 8.9 cfs (10-[10 x 0.11] = 8.9).

Table 2

MINIMUM FISH FLOW NEEDS ON THE LOWER CLACKAMAS RIVER MEASURED AT USGS GAGE 14211010, CLACKAMAS RIVER NEAR OREGON CITY, OREGON	
Month	Cubic Feet per Second
June – August	650
September	650/800[1]
October – May	800

[1]650 cfs Sept. 1 through Sept. 15 and 850 cfs September 16 through September 30

DATED: November 20, 2007

Dwight French, Administrator
Water Rights and Adjudications Division

If you have any questions, please check the information box on the last page for the appropriate names and phone numbers.

Proposed Final Order Hearing Rights

1. Under the provisions of OAR 690-315-0100(1) and 690-315-0060, the applicant or any other person adversely affected or aggrieved by the proposed final order may protest and request a contested case hearing on the proposed final order. Your request for contested case hearing must be in writing and must be received by the Water Resources Department no later than <u>January 4, 2008</u> being 45 days from the date of publication of the proposed final order in the Department's weekly public notice.

2. A written request for contested case hearing shall include:
   a. The name, address and telephone number of the petitioner;
   b. A description of the petitioner's interest in the proposed final order and if the protestant claims to represent the public interest, a precise statement of the public interest represented;
   c. A detailed description of how the action proposed in the proposed final order would adversely affect or aggrieve the petitioner's interest;
   d. A detailed description of how the final order is in error or deficient and how to correct the alleged error or deficiency;
   e. Any citation of legal authority supporting the petitioner, if known;
   f. Proof of service of the protest upon the water right permit holder, if petitioner is other than the water right permit holder; and
   g. The protest fee required under ORS 536.050, if petitioner is other than the water right permit holder.

3. Within 60 days after the close of the period for requesting a contested case hearing, the Director shall:
   a. Issue a final order on the extension request; or
   b. Schedule a contested case hearing if a request for contested case hearing has been submitted, and:
      1) Upon review of the issues, the Director finds there are significant disputes related to the proposed agency action; or
      2) The applicant submits a written request for a contested case hearing within 30 days after the close of the period for submitting protests.

If you have any questions about statements contained in this document, please contact Ann L. Reece at 503-986-0827.

If you have questions about how to file a protest or if you have previously filed a protest and you want to know the status, please contact Patricia McCarty at 503-986-0820.

If you have any questions about the Department or any of its programs, please contact our Water Resources Customer Service Group at 503-986-0801.

Address any correspondence to:	Water Rights and Adjudications Division 725 Summer St NE, Suite A Salem, OR 97301-1266
Fax: 503-986-0901	

Pelz, Zach

From: Sonnen, John
Sent: Tuesday, October 23, 2012 8:12 AM
To: Pelz, Zach
Subject: FW: LOT WTF CUP application WL PC

Please add to the record

John Sonnen, Planning Director
Planning and Building, #1524

From: Dave Froode [mailto:dfroode@comcast.net]
Sent: Tuesday, October 23, 2012 8:02 AM
To: Sonnen, John
Subject: LOT WTF CUP application WL PC

LOT has mentioned real estate impact to West Linn as a benefit. Hardly, if one examines the numbers.

Granted, not having 20 more houses in the Robinwood neighborhood reduces traffic flow but given the tremendous destructive flow of construction traffic during the three years, it is not a very good trade off. West Linn would much rather have the 20 new families then thousands of dump trucks destroying our streets and clogging our roads.

LO was asked by our planning commission why they were not building this facility in their own city. The answer, (my paraphrase) we do not own land in LO but do in West Linn and it is much less expensive to expand in West Linn.

Stinkin Thinkin

Several obvious facts that fly in the face of LO's thinking.

- Foothills area of LO is zoned for industrial.
- LO has employed eminent domain to litigate against West Linn property owners and could do the same to their own citizens.
- LO could have been purchasing land in LO but failed to plan. However they can purchase private property for 1.3 million dollars to build a public trail along the river.
- LO has Foothills earmarked for urban development wanting to preserver their tax base.

The Rub

Here is the rub and why this is not a benefit to West Linn.

1. Based on using my own property's tax rate, I estimate the tax assessed at $11.84 per $1,000.00 in value. But because not all of the tax is paid to the city, lets use 50% for this evaluation, or $5.92 per $1,000.00 that would be contributed to the city's tax fund.

2. LO will maintain approximately 20 private residences we can assume will be valued at a conservative number of $300,000.00 each. If we apply only half of the average property tax rate at $5.92 per $1,000.00, the amount of property tax LO preserves on these 20 homes is $1,776.00 per home or $35,520.00 total per year.

Plus they gain the economic impact of the added 20 families.

3. If West Linn were allowed 20 homes to be built on this same land, the benefit to West Linn would be the same amount or $35,520.00/ year plus not have the economic impact of 20 families.

4. Besides being tax exempt in WL, LOT still enjoy the benefits of WL resources in the event they are in need.

Conclusions

WL loses 35k LO gains 35k per year. Extending that over the next 40 years that is 1,420,800.00 based on current tax rates.

WL loses all of the economic impact for 20 homes and families would bring to WL.

This is not a benefit to West Linn!

David J. Froode
19340 Nixon Ave. West Linn Oregon

Pelz, Zach

From:	Sonnen, John
Sent:	Tuesday, October 23, 2012 8:11 AM
To:	Pelz, Zach
Subject:	FW: Finance Response RE: Questions regarding SFWB Rate & Cost Info
Attachments:	image001.gif

Please add to the record

John Sonnen, Planning Director
Planning and Building, #1524

From: Sonnen, John
Sent: Tuesday, October 23, 2012 8:10 AM
To: 'Russell Axelrod'
Cc: 'Michael Babbitt'; 'Steel, Christine'; 'Thomas Frank'; 'Gail Holmes'; 'Holly Miller'; 'Bob Martin'
Subject: FW: Finance Response RE: Questions regarding SFWB Rate & Cost Info

Information Russ requested

From: Seals, Richard
Sent: Monday, October 22, 2012 5:58 PM
To: Calvert, Lance; Pelz, Zach
Cc: Le, Khoi; Whynot, Jimmy; Sonnen, John
Subject: Finance Response RE: Questions regarding SFWB Rate & Cost Info

Sorry I couldn't get back to all sooner, I'm out at a training the first part of this week.

So you know, Finance has a webpage titled "The History of Water" that contains a wide assortment of financial information to include a 15 Year history on SFWB's rate and costs of water that West Linn purchases at wholesale rates.

The info you seek is contained in the 2nd to the bottom attachment on this online web-page:
http://westlinnoregon.gov/finance/history-water-west-linn

FYI - Their rate is currently $0.7561 per 100ccf

Let me know if anyone needs anything else,
Richard

Richard Seals, Chief Financial Officer
Finance, #1505

From: Calvert, Lance
Sent: Monday, October 22, 2012 4:52 PM
To: Seals, Richard

Cc: Pelz, Zach; Le, Khoi
Subject: RE: Questions regarding the LO project

Richard,

Please follow up with Zach on the wholesale water rate question posed below.

Thanks,

Lance

Lance Calvert, Public Works Director
Public Works, x1516

From: Pelz, Zach
Sent: Monday, October 22, 2012 3:59 PM
To: Le, Khoi; Calvert, Lance
Subject: FW: Questions regarding the LO project

Can one of you please provide information regarding Commissioner Axelrod's question below? I understand Jim Whynot is out this week.

Thanks,

Zach

Zach Pelz, Associate Planner
Planning and Building, #1542

From: Sonnen, John
Sent: Monday, October 22, 2012 8:11 AM
To: Pelz, Zach
Subject: FW: Questions regarding the LO project

Please get the requested info Russ and cc me
Thanks

John Sonnen, Planning Director
Planning and Building, #1524

From: Russell Axelrod [mailto:rbaxelrod@yahoo.com]
Sent: Sunday, October 21, 2012 6:36 PM
To: Sonnen, John
Subject: Re: Questions regarding the LO project

Hi John,
I have many questions and concerns. For the moment, please provide me with the cost that west linn pays (per cubic foot) for raw water and treated water through its agreement with the south fork water board.

Thanks, Russ

From: "Sonnen, John" <JSONNEN@westlinnoregon.gov>
To: "Babbitt, Michael" <Michael@michael-babbitt.com>; Bob Martin <drbobm4@gmail.com>; "Steel, Christine" <christine.steel@portofportland.com>; "Miller, Holly" <holly.millerc@gmail.com>; "Frank, Thomas" <mail@thomasafrank.com>; "Holmes, Gail" <gholmes927@aol.com>; Russell Axelrod <rbaxelrod@yahoo.com>
Cc: "Pelz, Zach" <ZPELZ@westlinnoregon.gov>
Sent: Friday, October 19, 2012 1:26 PM
Subject: Questions regarding the LO project

Hi. Thanks for having two, long, back to back meetings. If you have questions as you consider the testimony please email them to me and we will get response before your next meeting. Enjoy the weekend.

John

City of West Linn

John Sonnen
JSONNEN@westlinnoregon.gov
Planning and Building Director
22500 Salamo Rd.
West Linn, OR 97068
P: (503) 723-2524
F: (503) 656-4106
Web: westlinnoregon.gov

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Letters can be mailed to:
West Linn Planning Commission
22500 Salamo Road
West Linn, OR 97068

OCT 19 2012

OCT 23 2012

PLANNING & BUILDING
CITY OF WEST LINN
INT. ______ TIME ______

PLANNING & BUILDING
CITY OF WEST LINN
INT. ______ TIME ______

TO: West Linn Planning Commission

RE: Lake Oswego-Tigard Water Partnership

Date: October 8, 2012

I would like to submit this letter as my recorded testimony to the West Linn Planning Commission for the meeting scheduled on October 17th, 2012 regarding the Lake Oswego-Tigard Water Partnership Water Treatment Plant

The cities of Lake Oswego and Tigard are requesting a Conditional Use Permit to expand the current Water Treatment Plant on Kenthorpe Way in West Linn in order for Lake Oswego to enter into a **revenue generating agreement** with the city of Tigard to provide drinking water for Tigard. It is my understanding according to the West Linn Comprehensive Plan, the approval of a Conditional Use Permits **REQUIRES** a **"community benefit"**.

I don't believe there is any "community benefit" to West Linn or the **Robinwood Neighborhood** if this application is approved. Most of the benefits the LOT plan lists are either already in place (intertie) or will have to be done because the scope of this construction will destroy existing streets, pipelines and Mary S. Young State Park.

I do see an enormous list of horrific things no one could possibly consider a "community benefit" including:

- **West Linn Citizens** will have to endure 2+ years of constant construction including heavy truck traffic and loud heavy machinery noise for 11 hours EVERY weekday and 9 hours EVERY Saturday and Sunday. West Linn Citizens will be subjected to this type of construction for 7 days a week ... for 2 years – all for a *Revenue Generating Agreement* between the cities of Lake Oswego and Tigard.
- **West Linn Citizens** will have 2+ years of extremely limited access to their homes 24 hours a day, 7 days a week during this construction. The impact of this construction, especially to West Linn Senior Citizens living in this area, **Will Be Life Changing** in their daily routines. Also negatively affected will be main transportation and pedestrian routes and 24-hour emergency vehicle access.
- **West Linn Citizens** will be exposed to the possibility of reduced property values and irreparable damage to their homes because of pipeline placement and possible pipe breakage which will be the fiscal responsibility of the **West Linn Citizens**. Not the cities of Lake Oswego or Tigard.

Secondly, how can West Linn ALLOW Lake Oswego to **invalidate covenants established in 1944 by the City of West Linn** to **protect** property zoning on Mapleton Drive? How can West Linn even consider giving Lake Oswego the opportunity to exercise the option to use "eminent domain" in the city of West Linn? Up until now dealing with the Lake Oswego Water Treatment Plant has never been a problem for this neighborhood. It is now.

Lake Oswego's sole reason for expanding this plant is to build a revenue base by supplying water to Tigard. And they want to create this revenue base as cheaply as possible. **Who's looking out for West Linn Citizens?** You Should Be!

The City of West Linn asked us the question: "How does this proposal meet or not meet the approval criteria for a Conditional Use Permit?" As a **CITIZEN OF WEST LINN**, that's the question you must ask yourself. You represent West Linn. You need to think very carefully about the **CITIZENS OF WEST LINN** who will be so impacted if you give your approval to this Conditional Use Permit.

Respectively Submitted:

Jack Hatch — 3264 Forest Ct, West Linn Or 97068
Name — Address

Cheryl Hatch — 3264 Forest Ct, West Linn 97068
Name — Address

Pelz, Zach

From: Walters, Rebecca (DS) [Rebecca.Walters@adp.com]
Sent: Monday, October 22, 2012 1:11 PM
To: Pelz, Zach; planningcommission@westlinnoregon.gov; Jordan, Chris; Sonnen, John
Cc: Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); javahag@comcast.net; Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mark Mutschler (Drs.mutschler@gmail.com); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Ray and Kim Cozby (rcozby@hotmail.com); Walters, Rebecca (DS); Rich Sheu (rickveda22@yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229@msn.com); Shane Medberry (shanemedbery@me.com); Shanon Vroman (shanonmv@comcast.net); Sharon Knutson (norahs1344@yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacey Gianopoulis (butterqueen@comcast.net); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Tom & Gwen Sieben (gwensieben@att.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com)
Subject: forward to Planning Commissioners

Mr. Zack Pelz:

Please forward this email to our Planning Commissioners for the CUP hearing on the Lake Oswego/Tigard Water Treatment Facility Expansion and pipeline and please confirm that this was done.

There are three points that may not have been clear or stressed in the testimony at the CUP hearings last Wednesday and Thursday, which are Lake Oswego/Tigard partnership ("LOT") has initiated a lawsuit against the MapleGrove subdivision owners, 8 hours without water during construction and the cost of moving our water line. It is clear that our City of West Linn does not support covenants and restrictions on our properties but this may be relevant with regard to the Water Treatment Facility not being in keeping with the character of this residential neighborhood.

CC&R Lawsuit:

1. There are 88 parcels in the MapleGrove subdivision. Four of the lots are owned by Lake Oswego. The City of West Linn owns 1 lot and the state of Oregon owns 1 or 2 lots. The remainder are owned by individuals.

2. Each of the 88 parcels contain a covenant and restriction ("CC&R") that states only single family dwellings can be put on these lots.
3. Changes to the CC&Rs require 75% of the signatures of the 88 tax lots owners.
4. LOT was unable to get the 75% requisite signatures so LOT is using condemnation/imminent domain and has sued each of the owners that did not previously sign their waivers.
5. Some of us have had to pay out a considerable amount of money to hire an attorney to defend us in this lawsuit.
6. We have recently had two "Request for Admissions" from LOT's attorney to provide financial and personal information which takes a lot of time to gather all of this information.

Eight Hours Without Water: It is a problem when a resident of Mapleton Drive is home during this construction and there is no water for 8 hours, especially for our elderly neighbors.

Cost of Moving our Water Line: I do not understand why West Linn will be paying for half of the replacement of the water line on Mapleton Drive. Yes, replacing the asbestos/cement water line is a benefit but it is being moved to the other side of the street to make room for LOT's 42 and 48 inch pipeline. If you move asbestos, that is when it contaminates the air.

Thanks so much,

Rebecca Walters

Pelz, Zach

From: Dave Robinson [drcanes14@gmail.com]
Sent: Monday, October 22, 2012 10:14 AM
To: Gianopoulos Stacey
Cc: Walters, Rebecca (DS); Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mark Mutschler (Drs.mutschler@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000 @yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Ray and Kim Cozby (rcozby@hotmail.com); Rich Sheu (rickveda22@yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229@msn.com); Shane Medberry (shanemedbery@me.com); Shanon Vroman (shanonmv@comcast.net); Sharon Knutson (norahs1344@yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Tom & Gwen Sieben (gwensieben@att.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com)
Subject: Re: sheriff SWAT team

Sorry everyone that I'm so disgusted with Lake Oswego and the LOT, my concern was that LO is offering this to the county because they are such good neighbors, using the properties to look good . These properties have set idle for a long time, all of a sudden we have a flurry of activity, when some important decisions are about to be made for the LOT. Experience has taught me not to trust LO. That is what it was about for me, nothing against our public servants. Mary

On Fri, Oct 19, 2012 at 8:56 PM, Gianopoulos Stacey <butterqueen@comcast.net> wrote:
I would add to this the fact that Andy and I have allowed SWAT teams to use our Clackamas facility for training purposes. You may be reading too much into this. As has been stated, it is a routine matter for them....new locations, new terrain & etc.
For further information I can call Tony Kollias, the SWAT team coordinator who signed the letter. I know him personally from other circles.I will forward any information I find out.
Thanks,
Stacey Gianopoulos
On Oct 19, 2012, at 9:08 AM, Walters, Rebecca (DS) wrote:

Zach:

Would you please submit this email and letter to the Planning Commission for the Lake Oswego/Tigard Water Treatment Plant and Pipeline conditional use permits application?

This letter arrived yesterday at my home which is located on Mapleton Drive. This letter is indicative that the WTF/pipeline is a REGIONAL water supply and this letter is SCARY.

Here are a few excerpts but the entire letter is attached for your perusal.

"I am writing this to inform you that the Clackamas County Sheriff's Office Special Weapons and Tactics (SWAT) team plans to train in or near your neighborhood sometime in the next two weeks. .... You can expect to see many patrol cars from various law enforcement agencies within Clackamas County, deputies and police officers wearing heavy vests and helmets as well as several armored vehicles. ... You may hear small reports (pops) from training munitions throughout the day."

Thanks,
Rebecca Walters

<scan0001.pdf>

Pelz, Zach

From: Sonnen, John
Sent: Monday, October 22, 2012 8:13 AM
To: Pelz, Zach
Subject: FW: HWY 43

Please add to the record

John Sonnen, Planning Director
Planning and Building, #1524

West Linn Sustainability Please consider the impact on the environment before printing a paper copy of this email.
Public Records Law Disclosure This e-mail is subject to the State Retention Schedule and may be made available to the public.

-----Original Message-----
From: Cummings, Teri
Sent: Sunday, October 21, 2012 10:16 PM
To: Huey Meeker
Cc: Sonnen, John; Jordan, Chris; Mollusky, Kathy
Subject: RE: HWY 43

Dear Dr. Meeker,
Thank you for taking time to share your concerns about how this project may affect your business. I am not at liberty to comment at this time but will make sure this is placed on the record for consideration at the Planning Commission.
If you have not already presented your views in public yet , the Planning Commission will be accepting public testimony at their next meeting scheduled for this Thursday at 7:00 PM

Teri Cummings

22500 Salamo Road
West Linn, Oregon 97068

503-635-9241

Councilor Teri Cummings
mailto:tcummings@westlinnoregon.gov
West Linn City Councilor
22500 Salamo Rd
West Linn, OR 97068
P: (503) 657-0331
F: (503) 650-9041
Web: http://westlinnoregon.gov

West Linn Sustainability Please consider the impact on the environment before printing a paper copy of this email.
Public Records Law Disclosure This e-mail is subject to the State Retention Schedule and may be made available to the public.

From: Huey Meeker [champignac99@yahoo.com]
Sent: Thursday, October 18, 2012 10:12 AM
To: Tan, Jennifer
Cc: Kovash, John; Carson, Jody; Cummings, Teri
Subject: HWY 43

Dear Members of The Council:

As a business owner in West Linn I am writing to express my concern about the water project construction on HWY 43 next year.

I am sure you have thought about the traffic and the congestion it may create and how it will slow down businesses on this road. I like to know what plan you have to deal with this and how to minimize the damage it will bring to all businesses. For most of us, our business is our only source of income and the economy in the last few years has not been in our favor.

I welcome your thought on this matter.

Sincerely,

Huey Meeker, MD

RECEIVED

APR 20 2012

DEPARTMENT OF STATE LANDS

DATE STAMP

US Army Corps
Of Engineers (Portland District)

Joint Permit Application Form

AGENCIES WILL ASSIGN NUMBERS

Corps Action ID Number

Oregon Department of State Lands No 50349

SEND ONE SIGNED COPY OF YOUR APPLICATION TO EACH AGENCY

US Army Corps of Engineers:
District Engineer
ATTN: CENWP-OD-GPPO
Box 2946
Portland, OR 97208-2946
503-808-4373

AND

DSL - West of the Cascades:
State of Oregon
Department of State Lands
775 Summer Street, Suite 100
Salem, OR 97301-1279
503-986-5200

AND

Send DSL Application Fees to:
State of Oregon
Department of State Lands
PO Box 4395, Unit 18
Portland, OR 97208-4395
(Attach a copy of the first page of the application)

(1) APPLICANT INFORMATION

Applicant Name and Address	City of Lake Oswego Attn: Joel Komarek P.O. Box 369 Lake Oswego, OR 97034	Business Phone # Home Phone # Fax # Email	503-697-6588 jkomarek@ci.oswego.or.us
Authorized Agent Name and Address Check one Consultant ☒ Contractor ☐	Terry Buchholz Integrated Water Solutions, LLC 13370 SW 31st Court Beaverton, Oregon 97008	Business Phone # Home Phone # Fax # Email	503-469-0812 terry@integratedwatersolutions.net
Property Owner Name and Address If different from above[1]	Various See Section 1 of Appendix A	Business Phone # Home Phone # Fax # Email	

(2) PROJECT LOCATION

Street, Road or Other Descriptive Location		Legal Description (attach *tax lot map**)			
Linear pipeline project from Gladstone/Clackamas River to Tigard, Oregon. River Intake Pump Station is located: 105 East Clackamas Blvd., Gladstone, OR 97027		**Township** Start (RIPS): 2 S End (Tigard): 2 S	**Range** 2 E 1 W	**Section** 20 12	**Quarter/Quarter** SW NW
In or near (City or Town)	County	Tax Map #		Tax Lot #[2]	
Gladstone, West Linn, Lake Oswego, Tigard	Clackamas, Washington	Various. See Appendix G, Sheets 1-22		Various. See Appendix G	
Wetland/Waterway (pick one)	River Mile (if known)	*Latitude (in DD.DDDD format)*		*Longitude (in DD.DDDD format)*	
Clackamas and Willamette Rivers, various wetlands and unnamed waters	Clackamas R.: RM 0.8 Willamette R.: RM 24.2	Start (RIPS): 45.377593 End (Tigard): 45.415352		Start (RIPS): -122.592348 End (Tigard): -122.749901	
Directions to the site	See Appendix B, Figure 1. River Intake Pump Station (RIPS): Take 99E south to Gladstone; turn left on W. Arlington St; turn right on Barton Ave., which becomes Clackamas Blvd. Address 105 is on left side of road.				

[1] If applicant is not the property owner, permission to conduct the work must be provided prior to issuance of the final permit.
[2] Attach a copy of all tax maps with the project area highlighted.

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

(3) PROPOSED PROJECT INFORMATION

Type: Fill ☒ Excavation (removal) ☒ In-Water Structure ☒ Maintain/Repair an Existing Structure ☐

Brief Description: Project components include the following: Replacement and improvements to the existing Clackamas River intake pump station (RIPS), a new raw water pipeline (RWP) from the RIPS to the Water Treatment Plant (WTP), expansion and upgrades to the WTP, a new Finished Water Pipeline (FWP) that conveys water to Lake Oswego and Tigard, a second reservoir at the existing Waluga Reservoir Site to provide additional storage capacity, and a new Bonita Pump Station.

Fill

Riprap ☒ Rock ☒ Gravel ☒ Organics ☐ Sand ☒ Silt ☒ Clay ☐ Other: ☒ Concrete

Wetlands	Permanent (cy)	Temporary (cy)					Total cubic yards for project (including outside OHW/wetlands)	2,700 CY (perm.) 2,175 CY (temp.)
	0	0						
	Impact Area in Acres	Dimensions (feet)						
	0	L'	--	W'	--	H'	--		
Waters below OHW (Clackamas R. and Willamette R.)	Permanent (cy)	Temporary (cy)					Total cubic yards for project (including outside OHW/wetlands)	
	805	1,772						
	Impact Area in Acres	Dimensions (feet)						
	0.24 (temporary; overlap with removal area) 0.10 (permanent)	L'	varies	W'	varies	H'	varies	

Removal

Wetlands	Permanent (cy)	Temporary (cy)					Total cubic yards for project (including outside OHW/wetlands)	3,900 CY (perm.) 2,175 CY (temp.)
	0	0						
	Impact Area in Acres	Dimensions (feet)						
	0	L'	--	W'	--	H'	--		
Waters below OHW (Clackamas R. and Willamette R.)	Permanent (cy)	Temporary (cy)					Total cubic yards for project (including outside OHW/wetlands)	
	2,680	1,772						
	Impact Area in Acres	Dimensions (feet)						
	0.24 (temporary; overlap with fill area) 0.38 (permanent)	L'	Varies	W'	Varies	H'	varies	
Total acres of construction related ground disturbance	(If 1 acre or more a 1200-C permit may be required from DEQ)							2+ acres

Is the disposal area upland? Yes ☒ No ☐ Impervious surface created? <1 acre ☒ >1 acre? ☐

	Yes	No
Are you aware of any state or federally listed species on the project site?	X	
Are you aware of any Cultural/Historic Resources on the project site?	X	
Is the project site within a national Wild & Scenic River?		X
*Is the project site within a State Scenic Waterway?**		X

If yes, please explain in the project description (in block 4)

- *Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.*

(4) PROPOSED PROJECT PURPOSE AND DESCRIPTION

Purpose and Need:

*Provide a description of the public, social, economic, or environmental benefits of the project along with any supporting formal actions of a public body (e.g., city or county government), as appropriate.**

See Section 4.1 of Appendix A (Application Form Supplement)

Project Description:

Please describe in detail the proposed removal and fill activities, including the following information: See Sections 3, 4 and 5 of Appendix A.

- Volumes and acreages of all fill and removal activities in waterway or wetland separately
- Permanent and temporary impacts
- Types of materials (e.g., gravel, silt, clay, etc.)
- How the project will be accomplished (i.e., describe construction methods, equipment, site access)
- *Describe any changes that the project may make to the hydraulic and hydrologic characteristics (e.g., general direction of stream and surface water flow, estimated winter and summer flow volumes.) of the waters of the state, and an explanation of measures taken to avoid or minimize any adverse effects of those changes.*
- Is any of the work already complete? Yes ☐ No ☒ If yes, please describe the completed work.

Project Drawings

State the number of project drawing sheets included with this application: 38 (App. C and App. D)

A complete application must include a location map, site plan, cross-section drawings and recent aerial photo as follows and as applicable to the project:

- **Location map** (must be legible with street names)
  - Site plan including;
  - Entire project site and activity areas
  - Existing and proposed contours
  - Location of ordinary high water, wetland boundaries or other jurisdictional boundaries
  - Identification of temporary and permanent impact areas within waterways or wetlands
  - Map scale or dimensions and north arrow
  - Location of staging areas
  - Location of construction access
  - Location of cross section(s), as applicable
  - Location of mitigation area, if applicable *(not included in this draft)*
- **Cross section drawing**(s) including;
  - Existing and proposed elevations
  - Identification of temporary and permanent impact areas within waterways or wetlands
  - Ordinary high water and/or wetland boundary or other jurisdictional boundaries
  - Map scale or dimensions
- **Recent Aerial photo** (1:200, or if not available for your site, the highest resolution available)

Will any construction debris, runoff, etc., enter a wetland or waterway? Yes ☐ No ☒

If yes, describe the type of discharge and show the discharge location on the site plan.

See Project Description in Section 4.2 of Appendix A

RIPS Figures are included in Appendix C

Raw Water Pipeline (RWP), Finished Water Pipeline (FWP) and Bonita Pump Station (BPS) figures are included in Appendix D

Estimated project start date:	January 2, 2013	Estimated project completion date:	September 2015

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

(5) PROJECT IMPACTS AND ALTERNATIVES

Alternatives Analysis:

Describe alternative sites and project designs that were considered to avoid or minimize impacts to the waterway or wetland. (Include alternative design(s) with less impact and reasons why the alternative(s) were not chosen. Reference OAR 141-085-0565 (1) through (6) for more information).*

See Appendix F.

Measures to Minimize Impacts

Describe what measures you will use (before and after construction) to minimize impacts to the waterway or wetland. These may include but are not limited to the following:

- *For projects with ground disturbance include an erosion control plan or description of other best management practices (BMP's) as appropriate. (For more information on erosion control practices see DEQ's Oregon Sediment and Erosion Control Manual)*
- *For work in waterways where fish or flowing water are likely to be present, discuss how the work area will be isolated from the flowing water.*
- *If native migratory fish are present (or were historically present) and you are installing, replacing or abandoning a culvert or other potential obstruction to fish passage, complete and attach a statement of how the Fish Passage Requirements, set by the Oregon Department of Fish and Wildlife will be met.*

See Sections 4.2.1.3, and Section 5.2 of Appendix A and the Erosion and Sediment Control Plan in Appendix E.

Description of resources in project area

Ocean ☐ Estuary ☐ River ☒ Lake ☒ Stream ☒ Freshwater Wetland ☒

Describe the existing **physical and biological characteristics** of the wetland/waterway site by area and type of resource (Use separate sheets and photos, if necessary).

For wetlands, include, as applicable:

- *Cowardin and Hydrogeomorphic (HGM) wetland class(es)**
- *Dominant plant species by layer (herb, shrub, tree)**
- Whether the wetland is freshwater or tidal
- *Assessment of the functional attributes of the wetland to be impacted**
- Identify any vernal pools, bogs, fens, mature forested wetland, seasonal mudflats, or native wet prairies in or near the project area)

For waterways, include a description of, as applicable:

- *Channel and bank conditions**
- *Type and condition of riparian vegetation**
- *Channel morphology (i.e., structure and shape)**
- *Stream substrate**
- Fish and wildlife (type, abundance, period of use, significance of site)
- *General hydrological conditions (e.g., stream flow, seasonal fluctuations)**

See Section 5.3 of Appendix A

With regards to waterways - Project proponents are coordinating with NMFS and ODFW. As described in Section 4.4 of Appendix A, a Biological Assessment has been prepared to address the potential impacts to ESA-listed salmonids within the project area.

*Describe the existing **navigation, fishing and recreational** use of the waterway or wetland.**

See Section 5.3.3 of Appendix A.

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

Site Restoration/Rehabilitation

- *For temporary disturbance of soils and/or vegetation in waterways, wetlands or riparian areas, please discuss how you will restore the site after construction including any monitoring, if necessary.**

See Section 5.4 of Appendix A.

Mitigation

*Describe the reasonably expected adverse effects of the development of this project and how the effects will be mitigated.**

- *For permanent impact to wetlands, complete and attach a Compensatory Wetland Mitigation (CWM) Plan. (See OAR 141-085-0705 for plan requirements.)**
- *For permanent impact to waters other than wetlands, complete and attach a Compensatory Non-Wetland Mitigation (CNWM) plan. (See OAR 141-085-0765 for plan requirements.)**
- *For permanent impact to estuarine wetlands, you must submit a CWM plan.**

See Section 5.5 of Appendix A.

Mitigation Location Information (Fill out only when mitigation is proposed or required)

Proposed mitigation *(Check all that apply):*

- ☐ *Onsite Mitigation*
- ☐ *Offsite Mitigation*
- ☐ *Mitigation Bank*
- ☐ *Payment to Provide*

Type of mitigation:

- ☐ *Wetland Mitigation*
- ☐ *Mitigation for impacts to other waters*
- ☐ *Mitigation for impacts to navigation, fishing, or recreation*

Street, Road or Other Descriptive Location	*Legal Description (attach tax lot map*)*			
	Quarter/Quarter	*Section*	*Township*	*Range*

In or near (City or Town)	*County*	*Tax Map #*	*Tax Lot #*[3]
Wetland/Waterway (pick one)	*River Mile (if known)*	*Latitude (in DD.DDDD format)*	*Longitude (in DD.DDDD format)*

Name of waterway/watershed/HUC	*Name of mitigation bank (if applicable)*

[3] Attach a copy of all tax maps with the project area highlighted.

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

(6) ADDITIONAL INFORMATION

Adjacent to R-F Site and Physical Mitigation Site Property Owners and Their Address *(if more than 5, attach printed labels*)*

Refer to Appendix G for tax lot maps.

Has the proposed activity or any related activity received the attention of the Corps of Engineers or the Department of State Lands in the past, e.g., wetland delineation, violation, permit, lease request, etc.?

Yes ☒ No ☐

If yes, what identification number(s) were assigned by the respective agencies:

Corps #	NWP2010-188 (geotechnical boring)	State of Oregon #	44606-GA (geotechnical boring), 44628-AA (easement)

Has a wetland delineation been completed for this site? *Yes* ☒ *No* ☐

*If yes by whom?**	David Evans and Associates, Inc.

Has the wetland delineation been approved by DSL or the COE? *Yes* ☐ *No* ☒
If yes, attach a concurrence letter. *

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(7) CITY/COUNTY PLANNING DEPARTMENT AFFIDAVIT
*(TO BE COMPLETED BY LOCAL PLANNING OFFICIAL) **

I have reviewed the project outlined in this application and have determined that:

- ☐ This project is not regulated by the comprehensive plan and land use regulations.
- ☐ This project is consistent with the comprehensive plan and land use regulations.
- ☒ This project will be consistent with the comprehensive plan and land use regulations when the following local approval(s) are obtained.
- ☒ Conditional Use Approval
- ☒ Development Permit
- ☐ Other

This project is not consistent with the comprehensive plan. Consistency requires a

- ☐ Plan Amendment
- ☐ Zone Change
- ☐ Other

An application has ☒ has not ☐ been filed for local approvals checked above.

Local planning official name (print)	Signature	Title	City / County	Date
Chris Kerr	[redacted]	Senior Planner	Wasco Co.	4-5-12

Comments:

water treatment plant; conditional use currently under review.

(8) *COASTAL ZONE CERTIFICATION **

If the proposed activity described in your permit application is within the Oregon coastal zone, the following certification is required before your application can be processed. A public notice will be issued with the certification statement, which will be forwarded to the Oregon Department of Land Conservation and Development for its concurrence or objection. For additional information on the Oregon Coastal Zone Management Program, contact the department at 635 Capitol Street NE, Suite 150, Salem, Oregon 97301 or call 503-373-0050.

CERTIFICATION STATEMENT

I certify that, to the best of my knowledge and belief, the proposed activity described in this application complies with the approved Oregon Coastal Zone Management Program and will be completed in a manner consistent with the program.

Print /Type Name	Title
Applicant Signature	Date
The project is not located in the Oregon Coastal Zone.	

- *Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.*

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Local planning official name (print)	Signature	Title	City / County	Date
Chris Kerr	[redacted]	Senior Planner	West Linn	4-5-12

Comments:

Raw water and finished water pipeline. Application expected mid-May 2012.

(8) COASTAL ZONE CERTIFICATION *

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Local planning official name (print)	Signature	Title	City / County	Date
Clayton Glasgow	[redacted]	Planner	Gladstone	4-3-12

Comments:

Raw Water pipeline

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Local planning official name (print)	Signature	Title	City / County	Date
Clayton Glasgow	[redacted]	Planner	Gladstone	4-3-12

Comments:

as approved through Planning Files Z0335-340-11
Raw water intake/pump station

(8) *COASTAL ZONE CERTIFICATION **

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Local planning official name (print)	Signature	Title	City / County	Date
Jessica Numanoglu	[redacted]	Senior Planner	City of Lake Oswego	4/11/12

Comments:

Finished Water Pipeline

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Local planning official name (print)	Signature	Title	City / County	Date
Jessica Numanoglu	[redacted]	Senior Planner	City of Lake Oswego	4/11/12

Comments:

Waluga Reservoir

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- ☐ Zone Change
- ☐ Other

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Local planning official name (print)	Signature	Title	City / County	Date
Cheryl Caines	[redacted]	Associate Planner	Tigard	4/6/12

Comments:

This project requires a Site Development Review and Sensitive Lands Review - 100 year Floodplain.

(8) COASTAL ZONE CERTIFICATION *

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Print /Type Name	Title
Applicant Signature	Date
The project is not located in the Oregon Coastal Zone.	

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(9) SIGNATURES FOR JOINT APPLICATION

Application is hereby made for the activities described herein. I certify that I am familiar with the information contained in the application, and, to the best of my knowledge and belief. this information is true, complete, and accurate. I further certify that I possess the authority to undertake the proposed activities. By signing this application I consent to allow Corps or Dept. of State Lands staff to enter into the above-described property to inspect the project location and to determine compliance with an authorization, if granted. I hereby authorize the person identified in the authorized agent block below to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

I understand that the granting of other permits by local, county, state or federal agencies does not release me from the requirement of obtaining the permits requested before commencing the project. *I understand that payment of the required state processing fee does not guarantee permit issuance. The fee for the state application must accompany the application for completeness.*

Amount enclosed	*$670 + $135= $805*

Print /Type Name	Title	Print /Type Name	Title
Joel Komarek	Project Director for Lake Oswego	Terry Buchholz	Permit Coordinator
Applicant Signature	Date	**Authorized Agent Signature**	Date
[redacted]	2/5/2012	[redacted]	4/20/2012

[redacted]*cts and /or mitigation work proposed on land not owned by the applicant including state-owned submerged and submersible lands, please provide signatures below. A signature by the Department of State Lands for activities proposed on state-owned submerged/submersible lands only grants the applicant consent to apply for authorization to conduct removal/fill activities on such lands. This signature for activities on state-owned submerged and submersible lands grants no other authority, express or implied.*

Print /Type Name	Title	Print /Type Name	Title
Property Owner Signature	Date	***Mitigation Property Owner Signature***	Date

- ***Italicized areas are not required by the Corps for a complete application, but may be necessary prior to final permit decision by the Corps.***

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

APPENDIX A: JOINT PERMIT APPLICATION SUPPLEMENT

CONTENTS

Tables

Figures

1 APPLICANT INFORMATION

Refer to Section 1 of the Joint Permit Application Form.

1.1 PROPERTY OWNER LIST

Table 1. Property Owner Contact List

Table 1. Property Owner Contact List	
City of Lake Oswego 380 A Avenue PO Box 369 Lake Oswego, OR 97034 Contact: Joel B. Komarek, P.E. Phone: 503.697.6588 E-mail: jkomarek@ci.oswego.or.us	City of Gladstone 525 Portland Ave. Gladstone, OR 97027 Contact: Pete Boyce Phone: 503.557.2767 E-mail: boyce@ci.gladstone.or.us
Department of State Lands (Willamette R. and Clackamas R. below OHW) 775 Summer Street Salem, OR 97301 Contact: Tami Hubert, Senior Property Manager Phone: 503.986.5272 E-mail: tami.hubert@state.or.us	Oregon Parks and Recreation Department 725 Summer Street NE, Suite C Salem, OR 97301 Contact: Tim Wood, Director Email: tim.wood@state.or.us Phone: (503) 986-0718
Hunt Club 2725 Iron Mountain Blvd Lake Oswego, OR 97034 Contact: Janice Weis, Board President Phone: 503.961.2103 E-mail: weisjl@msn.com	City of Tigard 8777 SW Burnham Street Tigard, OR 97223 Contact: Dennis Koellermeier Phone: 503.718.2596 E-mail: dennis@tigard-or.gov

2 PROJECT LOCATION

Refer to Section 2 of the Joint Permit Application Form and Appendix B, Figure 1 (Overview Map).

3 PROPOSED PROJECT INFORMATION

Section 3 of the Joint Permit Application Form provides a summary of estimated wetlands and waters impacts. Table 2 provides detailed wetland and waters impacts estimates.

Table 2. Impacts
Page 1

Table 2. Impacts

Location/Activity	Wetland Delineation Report ID	Temporary, Permanent, No Impact	Wetland Impacts Acres	Wetland Impacts Fill (CY)	Wetland Impacts Removal (CY)	Waterway Impacts Acres	Waterway Impacts Fill (CY)	Waterway Impacts Removal (CY)	Impact Description and Avoidance and Minimization Notes	Appendix-Figure
RIPS										
Super sacks[1,3] - RIPS isolation	Clackamas River	Temporary	na	na	na	0.051	750	750	1 CY sacks filled with sand and gravel; approx 220' x 10' - 1st IWWP	C-3, 4, 5, 18
Super sacks[1,3] - cofferdam channelization	Clackamas River	Temporary[2]	na	na	na	0.060	525	525	1 CY sacks filled with sand and gravel: approx. 350' x 7.5'- 2nd IWWP	C-3, 4, 5
Super sacks[1,3] - cofferdam leakage control	Clackamas River	Temporary[3]	na	na	na	0.016	100	100	100 CY of super sacks will be relocated from the cofferdam channelization	C-3, 4
Work pad - rock/gravel	Clackamas River	Temporary	na	na	na	0.092	300	300	Rock gravel work pad for channelization, washed quarry spalls	C-3, 5
Cofferdam - spud piles	Clackamas River	Temporary	na	na	na	0.001	5	5	14" H pile; area rounded up - actual estimate is 0.00012	
Cofferdam - sheet piles	Clackamas River	Temporary	na	na	na	0.001	5	5	2' corrugated steel sheets	C-3, 4, 13
Temporary Work Bridges - steel pile	Clackamas River	Temporary	na	na	na	0.001	5	5	H or round steel pile; area rounded up - actual estimate is 0.0012	
Subtotal - RIPS Waters Temporary R/F[3]	Clackamas River	Temporary	na	na	na	0.221	1690	1690	See Notes 3, 5	
Channelization within the sheetpile cofferdam	Clackamas River	Permanent	na	na	na	0.029	na	250	Weathered rock	C-3
Channelization outside sheetpile cofferdam	Clackamas River	Permanent	na	na	na	0.258	na	1540	Weathered rock, channelization outside sheetpile cofferdam	C-3, 5
Existing RIPS removal between elevation (el.) 3 and 17	Clackamas River	Permanent	na	na	na	0.013	na	80	Removal of concrete and mechanical equipment	C-3, 4
Riprap removal	Clackamas River	Permanent	na	na	na	0.014	na	50	Located at upstream edge of existing intake	na
Rock removal for RIPS foundation	Clackamas River	Permanent	na	na	na	0.047	na	760	RIPS foundation excavation: 480 weathered rock+280 hard rock	C-4
Subtotal - RIPS Waters Permanent Removal	Clackamas River	Permanent	na	na	na	0.361	0	2680		
Rock fill in existing intake	Clackamas River	Permanent	na	na	na	0.047	95	na	Fill located between el. 3 and el. 9	na
Screen net material	Clackamas River	Permanent	na	na	na	0.002	1	na	Stainless steel	C-14, 17
Pump bells	Clackamas River	Permanent	na	na	na	0.001	10	na	Steel; area rounded up - actual estimate is 0.00037	C-14, 15, 16
RIPS foundation	Clackamas River	Permanent	na	na	na	0.034	130	na	Concrete	C-14, 15, 16
RIPS exterior walls below el. 17	Clackamas River	Permanent	na	na	na	0.005	140	na	Concrete	C-14, 15, 16
RIPS interior walls below el. 17	Clackamas River	Permanent	na	na	na	0.005	119	na	Concrete	C-14, 15, 16
RIPS structural backfill	Clackamas River	Permanent	na	na	na	0.012	310	na	Rock	C-15
Total - RIPS Waters Permanent Fill	Clackamas River	Permanent	na	na	na	0.107	805	0		
Total - RIPS Project Area[4]	Clackamas River		na	na	na	0.640	na	na	Work Isolation Area; not a sum of permanent and temporary disturbance areas. See notes 3, 5.	
RWP										
Meldrum Bar Platform Ecology Blocks, Quarry Spalls	Willamette River	Temporary	na	na	na	0.02	82	82	Temporary impacts for staging platform 900 sq. ft.	D-5, 6
Mary S. Young State Park	Wetland A	No Impact	na	na	na	na	na	na	No impact: HDD alignment does not impact Wetland A	D-12
Mary S. Young State Park	WR-1	No Impact	na	na	na	na	na	na	No impact: HDD alignment does not impact WR-1	na
Mary S. Young State Park	WR-2	No Impact	na	na	na	na	na	na	No impact; HDD alignment does not impact WR-2	na
Mary S. Young State Park	WR-3	No Impact	na	na	na	na	na	na	No impact. HDD alignment does not impact WR-3	na
Mapleton Drive	WR-4	No Impact	na	na	na	na	na	na	No impact. Pipe crosses under culvert: culvert protected in place	na
Mary S. Young State Park	Wetland B	No Impact	na	na	na	na	na	na	No impact. Alignment does not cross wetland.	na
Subtotal - RWP Waters Temporary R/F	Willamette River	Temporary	na	na	na	0.02	82	82		

Table 2. Impacts
Page 2

Table 2. Impacts

Location/Activity	Wetland Delineation Report ID	Temporary, Permanent, No Impact	Wetland Impacts Acres	Wetland Impacts Fill (CY)	Wetland Impacts Removal (CY)	Waterway Impacts Acres	Waterway Impacts Fill (CY)	Waterway Impacts Removal (CY)	Impact Description and Avoidance and Minimization Notes	Appendix-Figure
WTP										
Water Treatment Plant	None	No Impact	na	na	na	na	na	na	No impact: no wetlands or waterways at this location	na
FWP										
Mapleton Drive, culvert, STA: 441+25	WR-5	No Impact	na	na	na	na	na	na	No impact. Pipe crosses under culvert: culvert protected in place	na
Highway 43, culvert, STA: 421:+00	WR-6	No Impact	na	na	na	na	na	na	No impact. Pipe crosses over culvert; culvert protected in place.	na
Highway 43, culvert, STA: 417:+80	WR-7	No Impact	na	na	na	na	na	na	No impact. Pipe crosses over culvert; culvert protected in place.	na
Highway 43, culvert, STA: 402+30	WR-8	No Impact	na	na	na	na	na	na	No impact. Feature does not cross roadway.	na
Highway 43, culvert, STA: 393+40	WR-9	No Impact	na	na	na	na	na	na	No impact. Pipe crosses under culvert, culvert protected in place.	na
Highway 43, culvert, STA: 384+00	WR-10	No Impact	na	na	na	na	na	na	No impact. Pipe crosses over culvert. culvert protected in place.	na
Highway 43, culvert, STA: 357+75	WR-11	No Impact	na	na	na	na	na	na	No impact. Pipe crosses under culvert; culvert protected in place.	na
Highway 43, culvert, STA: 342+75	WR-12	No Impact	na	na	na	na	na	na	No impact. Pipe crosses under culvert, culvert protected in place.	na
Highway 43, culvert, STA. 331+75	WR-13	No Impact	na	na	na	na	na	na	No impact. Pipe crosses under culvert; culvert protected in place.	na
Oswego Lake	Oswego Lake	No Impact	na	na	na	na	na	na	No impact. Avoided by HDD bore. Staging areas away from OHWM.	na
Iron Mountain Blvd, culvert, STA: 134+50	WR-14	No Impact	na	na	na	na	na	na	No impact. Pipe crosses under culvert, culvert protected in place	na
Iron Mountain Blvd, STA: 99+00	WR-15	No Impact	na	na	na	na	na	na	Wetland does not cross road; no culvert in survey	na
Iron Mountain Blvd, culvert, STA:	Wetland C	No Impact	na	na	na	na	na	na	No impact. FWP alignment completely in existing paved roadway.	na
Iron Mountain Blvd	Wetland D	No Impact	na	na	na	na	na	na	No impact. FWP alignment completely in existing paved roadway.	na
Iron Mountain Blvd/LO Hunt Club	Wetland E	No Impact	na	na	na	na	na	na	No impact. FWP alignment completely in existing paved roadway	na
Iron Mountain Blvd	Wetland F	No Impact	na	na	na	na	na	na	No impact. FWP completely in existing paved roadway.	na
Springbrook Creek	Springbrook Creek	No Impact	na	na	na	na	na	na	Creek to be diverted through pipe during auger boring under creek	na
Waluga Park	Wetland G	No Impact	na	na	na	na	na	na	No impact. Alignment does not cross wetland.	na
Subtotal: Temporary Impacts	Wetland	No Impact	0	0	0	0	0	0		
Waluga Reservoir										
New Reservoir	none	na	na	na	na	na	na	na	No wetlands or waterways at this location; therefore no impacts	na
Bonita Pump Station										na
SW Bonita Road	WR-16	No Impact	na	na	na	na	na	na	No impacts.	D-15
SW Milton Court near pump station	WR-17	No Impact	na	na	na	na	na	na	No impacts.	D-15
Pump station	Wetland H	No Impact	na	na	na	na	na	na	No impacts, Wetland areas avoided.	D-15
Additional piping to pump station	Wetland I	No Impact	na	na	na	na	na	na	No impacts, Wetland areas avoided.	D-15
Additional piping to pump station	Wetland J	No Impact	na	na	na	na	na	na	No impacts. Wetland areas avoided.	D-15
Subtotal			na	na	na	na	na	na		
TOTALS										
Total Temporary Waters Impacts	Clackamas, Willamette	Temporary	na	na	na	0.241	1772	1772	Temporary Fill=Temporary Removal.	
Total Permanent Waters Impacts	Clackamas	Permanent	na	na	na	0.382	888	2680	Permanent Area includes fill and removal activities.	
Total Temporary Wetland Impacts	None	Temporary	0	0	0	na	na	na		
Total Permanent Wetland Impacts	None	Permanent	0	0	0	na	na	na		

Notes:

[1] Super sacks are 1 CY sand bags/sacks filled with sand and gravel

[2] All temporary fill will be removed upon completion of channel excavation, therefore fill volume = removal volume

[3] Volume will be relocated from cofferdam channelization to cofferdam leakage control

[4] Area will be leveled and returned to original contours

[5] Area includes overlap of impact areas.

3.1 SUMMARY OF IMPACTS

Permanent and temporary fill and removal impacts are expected in the Clackamas River and temporary impacts will occur in the Willamette River. The Horizontal Directional Drilling (HDD) crossing of Oswego Lake is not anticipated to impact wetlands or Ordinary High Water (OHW) elevation, because the crossing is trenchless and the entry and exit locations are well above the OHW elevation. As noted in Table 2, Water Resources 1 through 17 are not anticipated to be impacted by this project, either temporarily or permanently, and no permanent or temporary wetland impacts are anticipated.

4 PROPOSED PROJECT PURPOSE AND DESCRIPTION

The following information describes the Lake Oswego Tigard Water Partnership Project ("Project") for purposes of the Joint Removal-Fill Permit Application (JPA). This information was adapted from several sources, including the following:

- Biological Assessment – Draft (Integrated Water Solutions, 02/27/2012)
- Wetland Delineation,– Draft (David Evans and Associates, Inc., 02/27/2012)
- Technical Memoranda 09 – Permitting and Support Information, (Black & Veatch; 02/21/2012 and subsequent updates)
- Alternatives Analysis – Draft (Integrated Water Solutions, 01/24/2012)
- RWP and FWP Environmental Permit Narratives and Supporting Information – Draft (Kennedy Jenks; 12/30/2011, 02/25/2012, 04/03/2012 and 04/12/2012)
- All figures illustrating the wetlands and waterways associated with the Project are included as Appendices B, C, and D.

4.1 PURPOSE AND NEED

4.1.1 General Background

In August 2008, the cities of Lake Oswego and Tigard (the "Project Sponsors") entered into a partnership agreement for sharing drinking water resources and costs. Lake Oswego's water supply system was near capacity, and key facilities need expansion and upgrades. Tigard residents need a secure, dependable water source. Both cities want to keep water affordable for their customers, and sharing the cost of new infrastructure to serve both communities does that. Sharing water resources isn't new. Lake Oswego and Tigard have benefitted from a water sharing relationship dating back to the 1970s—Lake Oswego as the seller of water, Tigard as the buyer. The Oregon Water Resources Department (OWRD) and the conservation community encourage regional water supply planning and collaboration among multiple communities as an efficient and environmentally responsible way to manage water needs.

4.1.2 Project Need

The cities of Lake Oswego and Tigard have grown in population since their incorporations in 1910 and 1961, respectively, and have increased demand for water even though they have implemented water conservation measures. Lake Oswego and Tigard have undeveloped land within their Metropolitan Area Boundaries (the "Urban Growth Boundary"), that were established by of the Metropolitan Government (Metro). Development of these lands will increase the demand for water. The elected officials and governments of Lake Oswego and Tigard are responsible for ensuring adequate, safe drinking water for current and future citizens, and that responsibility involves planning for, financing, and building infrastructure that supports the needed safe drinking water supply in a manner consistent with water rights permits and state and federal environmental law.

Major components of the City of Lake Oswego's water supply system, which was constructed in the late 1960s, are nearing the end of their ability to reliably meet the water demands of the city residents and wholesale customers. Key facilities frequently need to operate with best utility and engineering practice. In addition, operations staff at the water treatment plant must exercise extraordinary care and diligence to ensure that treated water quality standards and goals are consistently achieved, regardless of incoming water quality. Despite conservation efforts and investments made in Lake Oswego's supply and treatment infrastructure to squeeze every bit of capacity and value from the more than 40-year-old system, renewal, replacement, and expansion of facilities must occur to reliably and economically meet this community's long-term needs for a safe drinking water supply.

The City of Tigard does not currently have an ownership position in a primary water supply source, and, therefore, has limited control over the availability and increasing cost of its water supply. Tigard currently obtains its water primarily through a contract with the City of Portland and, during peak use, in spite of significant conservation efforts, demand exceeds the contracted water allotment and infrastructure capacity. Currently, Tigard can only obtain 5.9 MGD from the City of Portland using the existing connections. Additionally, purchase of water from the City of Portland is more costly and availability of water is not guaranteed. The City of Tigard seeks a partnership in a water supply system that can ensure access to an affordable, adequate, reliable, long-term supply of safe drinking water.

Both communities—Tigard and Lake Oswego—want to pool their resources, implement real multi-community regional water supply planning, and replace the historical approach of isolated city-by-city competition for water with a cooperative approach on a joint project that will inure to the benefit of both for many years to come. Such projects cannot and should not be limited to the current need, but must take into account future need based on Metropolitan Government decisions on urban growth within the Metropolitan Area as well as realistic growth projections that, as is the case with Lake Oswego and Tigard, have been reviewed and found reasonable by the OWRD.

4.1.3 Project Purpose

The project purpose is to upgrade, replace, and expand Lake Oswego's existing drinking water infrastructure to provide water to Lake Oswego and Tigard, to satisfy current demands and for the anticipated growth in demand forecast to occur over the 30-year planning horizon. To ensure that the project purpose is achieved, the project must meet the following project objectives. Specifically, the project must:

- Be an adequate source of safe drinking water to supply the current and future demands of the citizens of Lake Oswego and Tigard over the 30-year planning horizon;

- Be a reliable, long-term supply that satisfies the water demands of the cities for the 30-year planning horizon while acknowledging the many uncertainties inherent in long-term water supply planning (e.g., population growth rates, development patterns and density, changes in basin hydrology, local and national economic conditions, changes in environmental regulations, conservation, etc.);
- Be a supply source that is acceptable and supportable by the policy makers and the end water users within Lake Oswego and Tigard, including residents, businesses, and wholesale customers, in the context of a safe drinking water supply as well as for the protection of the natural environment of Oregon;
- Be an affordable source that makes an efficient use of public dollars spent as measured by the cost per gallon of water delivered over the planning horizon; and
- Be permitable, constructable, and operational (including a 12-month operational startup and testing period) by June 30, 2016 (the expiration date of Tigard's contract with the City of Portland).

The proposed Project satisfies the project purpose and need, and:

- Implements improvements to Lake Oswego's existing River Intake Pump Station (RIPS) and Raw Water Pipeline (RWP), and Water Treatment Plant (WTP) that would be necessary even without the Project;
- Creates opportunities for new or upsized interconnections to other regional sources of supply, increasing reliability and providing a backup water source;
- Is the lowest-cost option for the City of Lake Oswego and for the City of Tigard; and
- Ensures the City of Tigard an ownership interest in supply facilities and a reliable long-term source of water.

The public, social, and economic benefits of the project derive from providing high quality drinking water to residents and businesses in Lake Oswego and Tigard. Environmental impacts have been taken into consideration and minimized to the maximum extent practicable by trenchless pipeline crossings of the Willamette River and Oswego Lake, and the avoidance of Springbrook Creek.

The proposed Project requires a Section 404 fill and removal permit from the U.S. Army Corps of Engineers (Corps), which constitutes the federal nexus requiring formal Endangered Species Act (ESA) consultation. ESA consultation requires a review of all potential impacts of the Project that could result in "take" of a listed species and/or loss or degradation of designated critical habitat for one or more listed species. A Biological Assessment is required as part of the consultation process and will be made available to regulatory agencies during the JPA review process. An additional agreement, the Lake Oswego and Tigard Intergovernmental Agreement regarding Water Supply Facilities Design, Construction and Operation, will be made available upon request.

4.2 PROJECT DESCRIPTION

The proposed Project would expand the current Lake Oswego and Tigard water supply facilities to accommodate the existing and future needs of both the City of Lake Oswego (24 million gallons per day [MGD]) and the City of Tigard (20 MGD), utilizing Lake Oswego's senior and junior water rights on the Clackamas River of 38 MGD. The City of Tigard will also use its Aquifer Storage and Recovery (ASR) system as a supplemental supply source. The proposed ASR system would provide a supplemental capacity of 5.8 MGD that would be used during times of seasonal peak demand.

The proposed Project (see Project Elements figure in Appendix B, Figure 1) would include the following facilities:

- New RIPS in Gladstone (RIPS drawings and figures in Appendix C);
- New RWP that conveys raw water to the Water Treatment Plant (WTP), located in West Linn (RWP and FWP drawings and figures in Appendix D);
- Expansion and upgrades to the WTP that will treat the raw water to meet current and anticipated future federal Safe Drinking Water Act standards;
- New Finished Water Pipeline (FWP) that conveys finished water to Lake Oswego and Tigard;
- A second reservoir (Waluga Reservoir 2) at the existing Waluga Reservoir Site to provide additional storage capacity; and
- New Bonita Pump Station (BPS) in Tigard (Appendix D)

4.2.1 River Intake Pump Station

The new RIPS will be located in the Clackamas River at river mile 0.8; approximately 15 feet (Datum NGVD29) upstream from the existing RIPS (see Appendix C, Figures 1 and 3. The new RIPS will consist of a concrete tower structure that houses the raw water pumps, wet well, and intake screens. An access bridge and deck will provide driving access and connect the paved parking area to the tower structure. A secant pile wall will be installed at the top of bank to prevent scour beyond the wall (see Appendix C, Figure 4). The design capacity of the pump station will be 38 MGD. The pumps will discharge into a new 42-inch diameter pipeline that will convey raw water to the Lake Oswego WTP.

As part of the construction of the new RIPS, the existing RIPS facility will be removed down to two feet above grade after the new RIPS is in service. The remaining concrete base will be filled with rock. The primary construction elements of the RIPS include:

- Install secant pile wall
- Construction of sheet pile cofferdam and work bridges
- Construction of the concrete tower structure
- Installation of interior structure and electrical and equipment testing
- Placement of temporary work pad and work area isolation
- Excavation of channel upstream of RIPS
- Demolition of existing intake tower

4.2.1.1 Schedule

The work is scheduled to occur during three in-water work periods (IWWP) from 2013 through 2015 (Figure 1 through Figure 3). The ODFW-approved IWWP for the Clackamas River is a 6-week window from July 15 to August 31. The in-water construction periods have been minimized to the maximum extent; however, the project requests in-water work extensions of four weeks each during the 2013 and 2014 IWWP. Based on discussions with Todd Alsbury, ODFW district fish biologist, the project is requesting a two week extension onto the beginning of the IWWP, and two weeks at the end for years 2013 and 2014. This will allow in-water pile driving to occur during August; the period of lowest abundance of ESA-listed fish. The schedule will still be very tight to achieve construction of the RIPS cofferdam and complete channelization in the proposed 10-week IWWPs. The schedule critical path follows the RIPS cofferdam installation. In order to focus the contractor's efforts on this critical path item during the 2013 IWWP, channelization will occur during the 2014 IWWP. The following bullets summarize the anticipated construction elements and schedule of the RIPS:

Primary construction elements include:

The anticipated construction sequence is as follows:

- First in-water work period (2013) – Proposed July 1 through September 15:
    - Install secant pile wall (this activity is above OHW and may be constructed prior to the IWWP).
    - Install turbidity curtain around cofferdam site
    - Construct two pile supported work bridges for cranes
    - Install super sack cofferdam around RIPS construction area. Super-sacks are bags filled with approximately one cubic yard of gravel and sand.
    - Conduct fish salvage
    - Prepare/excavate site for sheet pile cofferdam; dewatering to be determined by contractor
    - Install ring template spud pile, ring walers, and sheet pile; seal cofferdam as feasible
    - Dewater sheet pile cofferdam in stages and monitor
    - Start to excavate intake footing inside sealed cofferdam
    - Remove super sack cofferdam
- Work season between first in-water period and second in-water work period:
    - Complete excavation for intake footing
    - Construct intake and permanent access bridge
    - Use upstream crane to remove debris at upstream end of cofferdam
    - Test intake installation/tee screens/rail system in the dry as required
    - Flood cofferdam and test intake installation/tee screens/rail system in the wet as required

Figure 1: Construction Schedule for IWWP One (2013)

Lake Oswego - Tigard Water Partnership

River Intake Pump Station

Construction Schedule for In-Water Work Period One - 2013

Item No.	Description	Duration (Work Days)	Start Date	Finish Date	1-Jul	8-Jul	15-Jul	22-Jul	29-Jul	5-Aug	12-Aug	19-Aug	26-Aug	2-Sep	9-Sep
1	Install Piles and Complete Construction Access Bridges	10	1-Jul	14-Jul			<--- Before IWWP								
2	Install RIPS Isolation Super Sack Cofferdam	10	15-Jul	28-Jul											
3	Prepare Foundation for Sheetpiles	10	29-Jul	11-Aug											
4	Install Ring Template Spud Piling	5	12-Aug	18-Aug											
5	Install Sheet Piling	5	19-Aug	25-Aug											
6	Install Whaler/Struts, Commence Dewatering	5	26-Aug	1-Sep											
7	Remove Super Sack Cofferdam	10	2-Sep	15-Sep								After IWWP --->			

- Second in-water work period (2014) – Proposed July 1 through September 15:
    - RIPS construction sequence:
    - Use upstream crane to facilitate channelization
    - Install turbidity curtain around sheet pile cofferdam
    - Remove cofferdam sheet pile, ring walers, and spud pile
    - Remove downstream work bridge
    - Continue to support channelization work from upstream work bridge
    - Remove construction access bridge and support piles
    - Channelization construction sequence:
    - Install turbidity curtain
    - Mobilize equipment to lower bank (rock outcropping)
    - Construct super sack cofferdam
    - Construct temporary work pad
    - Excavate channelization area
    - Treat turbid water, then remove channelization super sack cofferdam
    - Remove work pad
    - Demobilize equipment from rock outcropping and remove turbidity curtain

Figure 2: Construction Schedule for IWWP Two (2014)

Lake Oswego - Tigard Water Partnership

River Intake Pump Station

Construction Schedule for In-Water Work Period Two - 2014

Item No.	Description -RIPS	Duration (Work Days)	Start Date	Finish Date	1-Jul	8-Jul	15-Jul	22-Jul	29-Jul	5-Aug	12-Aug	19-Aug	26-Aug	2-Sep	9-Sep
0	Complete RIPS Construction, Flood Cofferdam and Remove Cofferdam Whalers/Struts	10	1-Jul	14-Jul			<--- Before IWWP								
1	Install Turbidity Curtain and Remove Cofferdam Sheet Piles	5	15-Jul	21-Jul											
2	Remove Ring Template Spud Piling	5	22-Jul	28-Jul										After IWWP -->	After IWWP -->
3	Remove Downstream Construction Access Bridge	5	29-Jul	4-Aug											
4	Continue to Support Channelization from Upstream Construction Access Bridge	45	19-Aug	25-Aug											
5	Remove Construction Access Bridge and Support Piles	5	26-Aug	1-Sep											

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River Intake Pump Station

Construction Schedule for In-Water Work Period Two - 2014

Item No.	Description - Channelization	Duration (Work Days)	Start Date	Fini Date	1-Jul	8-Jul	15-Jul	22-Jul	29-Jul	5-Aug	12-Aug	19-Aug	26-Aug	2-Sep	9-Sep
1	Protect Parkland, Mobilize Equipment to Lower Bank, Construct Work Pad	5	15-Jul	21-Jul											
2	Install Turbidity Curtain, Construct Channelization Super Sack Cofferdam	10	22-Jul	4-Aug										After IWWP -->	
3	Excavate Channelization Area	15	5-Aug	25-Aug											After IWWP -->
4	Treat Turbid Water and then Remove Channelization Super Sack Cofferdam	10	26-Aug	8-Sep											
5	Remove Work Pad, De-Mobilize Equipment from Lower Bank, Restore Bank	5	9-Sep	15-Sep											

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- Third in-water work period (2015) – Proposed July 15 through August 31:
  - Demolish existing intake down to OHW elevation (el. 17). This may be completed before the approved IWWP.
  - Install turbidity curtain around existing intake
  - Remove existing intake access bridge and existing intake tower down to two feet above grade using wire saws; the resulting elevation of the remaining shell will vary from approximately elevation three feet on the river side to elevation ten feet on the bank side.
  - Fill the remaining base of structure with rock
  - Remove turbidity curtain

Figure 3: Construction Schedule for IWWP Three (2015)

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River Intake Pump Station

Construction Schedule for In-Water Work Period Three - 2015

Item No.	Description	Duration (Work Days)	Start Date	Finish Date	1-Jul	8-Jul	15-Jul	22-Jul	29-Jul	5-Aug	12-Aug	19-Aug	26-Aug	2-Sep	9-Sep
1	Demolish Existing Intake Tower to Elevation 17.0	TBD	TBD	14-Jul	<--- Note: Before IWWP, saw slurry will be captured and removed above WSL.										
2	Install Turbidity Curtain Around Existing Intake	5	15-Jul	21-Jul											
3	Saw Cut and Remove Existing Tower to 2' Above Grade	15	22-Jul	11-Aug											
4	Fill Remaining Shell with Rock	5	12-Aug	18-Aug											
5	Remove Turbidity Curtain	5	19-Aug	25-Aug											

4.2.1.2 Project Area

The majority of construction activities above OHW will occur within the staging area at the top of bank, or street level. This area is composed of paved parking areas, minimal upland vegetation, and a steep embankment that descends to an OHW elevation of 17 feet (see Appendix C, Figure 3).

The existing paved area, on property owned by the City of Lake Oswego, along with adjacent public areas at the Clackamas Boulevard cul-de-sac, will accommodate construction equipment and materials. Access to the river area is available by a crane staged on temporary construction bridges, a crane staged in the existing paved area, and down the existing embankment for specialty equipment. It is expected that most equipment and materials necessary to perform work at river level will be hoisted by crane to the temporary work pad or the RIPS.

The in-water work area is approximately 0.64 acre (i.e. below an OHW elevation of 17 feet), within the Clackamas River. The delineated in-water work area allows for required river isolation and work activities to accommodate channelization upstream from the RIPS, construction of the new RIPS, and demolition of upper portions of the existing RIPS. Work at the RIPS site will include approximately 1,685 cubic yards of temporary fill and subsequent removal. Permanent impacts below the OHW elevation is estimated to be 0.36 acres including 2,680 cubic yards of permanent removal and 805 cubic yards of permanent fill.

4.2.1.3 Erosion and Sediment Control and Pollution Control Activities

A detailed Erosion and Sediment Control Plan (ESCP) is included in Appendix E. Because portions of the RIPS site are located in the Clackamas River, best management practices (BMPs) will be incorporated into the RIPS construction and operation to protect water quality. While the ESCP is specific to the RIPS site, all BMPs discussed in the ESCP are applicable to the RWP and FWP portions of the project and will be applied as necessary throughout the project. Construction contractors will be responsible for developing their own site-specific ESCP and Pollution Control Plan (PCP) for separate segments of the project. The ESCP included in Appendix E will be used as a basis for their site-specific plans. A detailed summary of erosion and sediment control BMPs by construction phase, including inspection and maintenance requirements, is available in the ESCP included in Appendix E.

The Project will secure a NPDES 1200-C permit from the Oregon Department of Environmental Quality (ODEQ) and will also comply with the erosion and sediment control requirements established by the City of Gladstone's erosion and sediment control ordinances, the Section 404 permit from the Corps, and the Removal-Fill permit from DSL.

To ensure that appropriate erosion and sediment control measures are implemented, inspected, and maintained during the duration of construction activities, the City of Lake Oswego will designate an Owner Environmental Inspector. Responsibilities and duties of such personnel as related to erosion and sediment control may include the following:

- Inspection of erosion prevention and sediment control measures (BMPs).
- The following erosion prevention and sediment control administrative activities will be conducted by the designated Owner Environmental Inspector before, during, and after construction.

- Conduct pre-construction meeting to inform construction personnel and agency engineers on erosion and sediment control BMPs. The designated RIPS construction boundary will be described during the meeting.
- Oversee the phasing and installation of erosion prevention and sediment control BMPs.
- Conduct inspections and observe maintenance of all installed erosion prevention and sediment control BMPs and record inspection and observation results.
- Review and approve any additions or modifications of erosion prevention and sediment control BMPs based on the contractor's identification of changes in site conditions for the duration of construction, as long as such additions or modifications are in general conformance with permit conditions and standards.
- Inform the City of Lake Oswego, Clackamas County Water Environmental Services (WES), and ODEQ of any issues.
- Conduct ongoing training of construction staff related to environmental protection requirements.
- Conduct inspections of permanent soil stabilization measures.
- Identify potential or actual non-compliance conditions and inform the contractor of such conditions.

4.2.1.4 Construction Phases and Elements

The construction phasing outlined below describes the general construction activities that will take place throughout the duration of the RIPS construction. Each project element or segment below identifies how BMPs are implemented throughout the duration of construction.

4.2.1.4.1 Phase 1: Mobilization and Installation of Temporary Pollution, Erosion and Sediment Control BMPs

Initial site activities involve mobilization of equipment and installation of temporary erosion prevention and sediment control BMPs throughout the RIPS construction area to prevent potential erosion and runoff contamination from the RIPS construction area. Specific construction activities include the following:

- Set up construction trailers and some material storage and stockpiling areas that will be located on the existing asphalt within the designated construction staging area.
- Establish off-site locations for material storage and stockpiling. Any upland, off-site agreements for additional parking or materials storage will be the contractor's responsibility.
- Install appropriate perimeter controls around the RIPS construction area, including delineation of areas where natural vegetation is to be preserved.
- Install a stabilized construction entrance, as necessary. The construction site entrance will be located at the western edge of the RIPS parking lot. A wheel wash is not proposed given that vehicle travel will be isolated to paved surfaces.
- Install a temporary worker access stairway to the lower bank area.
- Depending on site-specific and in-stream flow conditions in the Clackamas River, silt fencing may be installed at the edge of the embankment above OHW. The presence of exposed soil will likely determine if this is necessary.

- Install Type V catch basin inserts at the street level staging area and along Portland Avenue to the intersection of Portland Avenue and West Arlington Street, as necessary.
- Mobilize construction equipment. Steel plating will likely be placed over the existing asphalt surface to protect and preserve the existing pavement. Equipment to be mobilized on-site includes cranes, excavation equipment, concrete trucks, and cofferdam installation equipment.
- Implement secondary containment and spill prevention BMPs in surrounding areas where equipment mobilization (crane assembly) and equipment transport will occur.
- Maintain and operate equipment according to pollution control requirements. All equipment operating over the water and/or below OHW will utilize biodegradable oils and lubricants. All construction equipment used below OHW will be washed after hoisting back to the paved parking surface, where it will be contained during washing to prevent potential pollutants from entering the stormwater drainage system or Clackamas River.
- Stormwater runoff from new or redevelopment activities subject to the City's development standards must be managed in accordance with the City of Gladstone Stormwater Treatment and Detention Standards.

4.2.1.4.2 Phase 2: Site Clearing and Grubbing

Vegetation clearing will be minimal and limited to the staging area at street level. Specific activities include the following:

- Remove identified trees necessary for construction access and identify and protect trees to be preserved. Appendix C, Figure 18 shows trees that are proposed to be removed. Approximately nine trees ranging from five to 40 inches diameter at breast height (DBH) are proposed to be removed. A tree assessment has been conducted in compliance with City of Gladstone code.
- Temporarily remove the existing vegetated island located within the temporary construction staging area and remove fencing and guardrail at the top of the steep bank.
- Initiate ground cover thinning for construction of temporary access stairs to the bottom of the bank or where the proposed RIPS access bridge will be constructed, as determined necessary by the contractor.

Because of the steep riverbank, it will be important to avoid bank disturbances and maintain existing vegetation where possible. Natural vegetation will be preserved to the extent possible. Additionally, erosion and sediment control BMPs implemented during Phase 1 will be preserved.

4.2.1.4.3 Phase 3: Secant Pile Wall

The existing bank above approximately elevation 32 feet consists of gravel and is more suspect to raveling than the relatively harder weathered basalt below this elevation. A constructability review determined that the approach to long-term slope protection must be integrally tied to the permanent access bridge abutment. The permanent access bridge abutment and temporary work bridges are proposed to be supported by a secant pile wall, as shown in Appendix C, Figures 18 and 22. The secant pile wall can be constructed from the top of bank. The secant pile wall will be approximately seven feet inland from the top of bank and extend the width of the permanent access bridge and wing back at the ends. It will extend from street level (el. 57) to approximately elevation 20 feet. The secant piles will be placed between drilled shaft piles. The wall will form a secure barrier against further erosion and support the existing parking area and permanent access bridge.

4.2.1.4.4 Phase 4: RIPS Temporary Measures: Isolation, Work Bridges, Fish Salvage and Cofferdam

The RIPS will be constructed over two, successive IWWPs. During the first IWWP, a sheet pile cofferdam will be constructed. The intake will then be constructed and tested outside the IWWP but within the cofferdam. During the second IWWP, the RIPS sheet pile and super sack cofferdams will be removed and the channelization super sack cofferdam will be installed, as discussed below).

Work Bridges

Initially, the work area will be isolated with a turbidity curtain intended to minimize turbidity but not necessarily intended to be fish-tight.

Construction of the RIPS facility will require work bridges to be installed upstream and downstream of the permanent RIPS access bridge location to allow cranes to access the RIPS work area footprint (Appendix C, Figure 4). The work bridges will be designed and constructed by the contractor. It is likely they will be pile-supported with bents located on the top and toe-of-bank. Up to 25 steel 14-inch "H" pile or 16-inch round steel pile will be used to support the temporary work bridge. All piles will be located below OHW, but above the water surface elevation (WSE) at the time of pile driving, assuming a typical low-water surface elevation of 11 feet NGVD 29. The piles will be driven with a steel impact hammer. The bridges will extend from the top of bank to the sheet pile cofferdam footprint location, and are likely to be 30 feet wide.

River Isolation

Once work bridges are in place, cranes will operate from the work bridges to place super sacks around the outer perimeter of the proposed sheet pile cofferdam (Appendix C, Figure 3). The purpose of the RIPS super sack cofferdam is to isolate the work area from fish and flowing water, and to mitigate and minimize discharge of silt and sediment-laden water outside of the in-water work area. The work to install the three-sided cofferdam will be performed by two cranes and smaller excavation equipment working inside the cofferdam.

Fish Salvage

Following isolation of the work area, and before sheet pile cofferdam construction and dewatering activities, a fish salvage operation will be implemented to return fish contained in the isolation system to the Clackamas River. The fish salvage operation will be conducted with approval of appropriate environmental agencies and coordinated with the selected contractor. Fish salvage will be performed by trained and qualified biologists.

Cofferdam

Design and construction of the sheet pile cofferdam and dewatering system will be the responsibility of the selected contractor, who can select a system that fits the overall needs for the site. The City's design engineer will provide the contractor with a set of cofferdam guidelines. The cofferdam system must be capable of a relatively watertight seal with the basalt bedrock. The cofferdam system may potentially consist of sheet piles supported by vertical spud piles and horizontal ring beams. An attempt will be made to drive the sheet pile with a vibratory hammer, but substrate conditions will likely require the use of an impact hammer. The spud pile will also likely be installed with an impact hammer. The initial design and constructability review presume the cofferdam will be approximately 90 feet by 60 feet (Appendix C, Figure 4).

The sheet pile cofferdam will be in place from approximately August 2013 through July 2014, or 11 months. It will be constructed to a minimum elevation of 31.5 feet (NVGD 29), which is the 5 year flood elevation (Appendix C, Figure 7). If the cofferdam is overtopped, it is assumed that pollution control BMPs will be deployed and fish salvage will occur.

Dewatering

After installation the sheet pile cofferdam will be dewatered to the extent possible. Seepage may be reduced by sandbags and/or super sacks; the cofferdam may require continuous dewatering and pumping throughout construction (Appendix C, Figure 3). The pumps will discharge only non-sediment-laden water inside the super sack cofferdam or turbidity curtain to reduce the potential turbidity impact to the Clackamas River. Turbid water is likely to be pumped to a small sediment treatment basin at the street level staging area. The goal of the treatment basin will be to remove suspended material to prevent an unacceptable increase in turbidity between the upstream to downstream monitoring stations. The sheet pile cofferdam will be removed in the subsequent year's IWWP.

4.2.1.4.5 Phase 5: RIPS Site Grading and Foundation Construction

Following sheet pile cofferdam construction and dewatering, site grading and excavation will occur within the RIPS site. Site grading and excavation will be conducted to create a suitable and level rock base on which to build the RIPS foundation. Grading to support construction of the RIPS foundation and installation of bank protection may occur through rock chipping with excavating equipment. Excavating equipment will be mobilized into the isolated area using cranes. Erosion prevention and sediment control BMPs described in construction Phase 1 and in Appendix E will continue to be implemented.

The RIPS foundation and access bridge abutment will be constructed of formed and poured concrete with rebar. Spill containment and other pollution prevention BMPs will be implemented within the dewatered construction area and for the asphalt surface at the top of the embankment where construction staging and equipment mobilization is occurring.

4.2.1.4.6 Phase 6: Facility and Permanent Access Bridge Construction

The selected contractor will construct the RIPS in accordance with requirements outlined in project plans (Appendix C, Figures 3, 4, 7, 8 and 13-15) and the local, state and federal permits received. The RIPS will be constructed over two, successive IWWPs (2013 and 2014). For the first IWWP, a minimum 4 week extension is required to complete the work safely and to enable measures to be constructed to reduce risk to cofferdam failure. The overall dimensions of the intake above the footing are approximately 56 feet by 23 feet. The bullnose geometry will limit debris accumulation against the structure. Fish screens and approach velocity are discussed in Section 4.2.1.5 below. The facility is proposed to be constructed inside the sheet pile cofferdam after the end of the first IWWP. The permanent access bridge will be constructed during this phase. Erosion prevention and sediment control BMPs implemented during earlier construction phases will be maintained.

4.2.1.4.7 Phase 7: Utility Connections and Site Civil Construction

After the RIPS facility is constructed and the associated internal mechanical and electrical components are installed, the crane used to transport large equipment and materials to the dewatered portion of the RIPS site will be moved or demobilized to allow utility construction. Specific civil and utility construction activities include the following:

- Post-construction stormwater conveyance system construction.
- Water and electrical utility connection.
- Partial pavement restoration and replacement.

The RIPS facility will pump water through a 42-inch-diameter raw water transmission pipeline that that will be routed under the deck level of the RIPS access bridge. Before the RIPS facility is operational, the 42-inch-diameter pipeline will be extended across the City property boundary for eventual tie-in to a new 42-inch-diameter RWP that runs to the WTP in West Linn.

4.2.1.4.8 Phase 8: Temporary Work Bridge and Sheet Pile Removal

The downstream work bridge, work bridge pile, and sheet pile cofferdam structure will be removed at the beginning of the second IWWP (2014). Pile will be pulled with a vibratory extraction hammer. A crane operating from the upstream work bridge will support the channelization work upstream of the RIPS structure. Super sacks used to seal the sheet pile cofferdam will be moved to the channelization work area (Appendix C, Figures 3 and 5).

4.2.1.4.9 Phase 9: Channelization Equipment Access, Temporary Work Pad and River Isolation

Excavation of the river channel upstream of the RIPS will occur during the second IWWP (2014). Channel excavation will require isolation from the Clackamas River. The river isolation system will be installed during the Clackamas River's approved IWWP. A 4-week extension is being requested for the 2014 IWWP. Initially, the contractor is likely to install a turbidity curtain along the outside boundary of the channel excavation area to protect the Clackamas River from potential turbidity impacts. Work below the OHW elevation will include equipment access, installation of a temporary work pad, river isolation, channelization, and temporary cofferdam removal.

Equipment and River Access

An access route will be necessary for large equipment to access the river channel. The design team anticipates the contractor will "walk" equipment down the bank to the rock outcropping where a temporary work pad will be constructed (Appendix C, Figures 5 and 18). In order to maintain bank stability and prevent erosion, it is anticipated that the contractor will stage limited equipment and materials on the temporary work pad, and limit the use of the access route. Staging on the temporary work pad for approximately two to four weeks will also increase worker productivity during the limited IWWP, which decreases the potential for future IWWP extension requests. Smaller support equipment will be lowered to the site via the crane operating on the RIPS upstream temporary work bridge.

Temporary Work Pad

The temporary work pad will be used to place super sacks for river isolation and to conduct the channelization work described below (Appendix C, Figures 5 and 18). The footprint of the temporary work pad may be altered depending on the actual super sack cofferdam location and channel contours. The rock outcropping where the temporary work pad will be placed is composed of rough and uneven mudstone. A layer of washed quarry spalls (approximately 3 to 8 inch angular rock) will be placed over the mudstone for protection. The work pad will be lined with geotextile fabric and likely a stronger supportive material, such as chain link fence, to facilitate removal of the quarry spalls after the cofferdam is disassembled. Quarry spalls may be contained within the work pad footprint by hard structures, such as jersey barrier, where feasible. Hydraulic fluid, machine lubricants, fuels, and oils will be stored at the paved staging area at street level; however, a containment device located at the toe of slope may store small quantities of these products during working hours. A contained area may be designated for storage of small equipment and supplies when the work pad is in place. The temporary work pad is expected to be in place approximately four weeks.

River Isolation and Fish Salvage

Isolation work will begin by loading super sacks and smaller support equipment down to the rock outcropping or temporary work pad site via the crane operating from the RIPS upstream temporary work bridge. Excavators operating from the temporary work pad will install a super sack cofferdam around the channelization work area. The temporary work pad may be extended as necessary so that the excavator can reach the outer limits of the excavation area. Once isolated, fish salvage operations will be conducted. Dewatering of the super sack cofferdam is impractical and is not proposed. The super sack cofferdam will be removed prior to the end of the approved IWWP.

4.2.1.4.10Phase 10: Channelization

Channelization (excavation) of the river channel will be conducted to improve water approach velocities at the water intake fish screens (Appendix C, Figures 3 and 8-11). Work will begin by excavating soft, or loose, rock with an excavator. Bedrock will be removed by breaking it up with an excavator-mounted demolition hammer then removing with the excavator. Spoils are likely to be removed from the site with a crane and hopper assembly, or conveyor system, and then loaded into trucks for disposal.

Note that a portion of the channelization excavation is outside the proposed channelization cofferdam (Appendix C, Figure 3). To install the portion of the channelization super sack cofferdam that abuts the existing RIPS, the contractor will coordinate removal of the sheet pile and any spud pile interfering with super sack placement ahead of time. While the channelization cofferdam is in place, the new RIPS will not be fully functional.

After material removal, high sediment water within the excavation area will be pumped into the upland treatment basin for treatment before the removal of the super-sack cofferdam. Upon completion, the super-sack coffer dam will be disassembled and lifted from the site using the crane and excavator. This work, from mobilization to demobilization is expected to take four to six weeks. The channelization work is shown in Appendix C, Figures 3, 5-11, 18 and 19.

4.2.1.4.11Phase 11: Existing RIPS Removal

After the new RIPS is installed and functional, the existing RIPS will be disassembled and removed in two stages: removal above OHW and removal below OHW (Appendix C, Figure 19. The existing RIPS will likely be removed above OHW before the third IWWP. The work of the upper sections will be completed out of the water. The tower will be removed via a wire saw cutting operation one lift at a time. A gutter will be sealed to the faces of the walls being saw cut to catch the saw slurry.

Work below the OHW elevation will be conducted during the standard IWWP of July 15 through August 31 (2015). A turbidity curtain will be installed around the existing intake. The remaining portion of the existing intake tower will be removed to within two feet of the existing grade using crane mounted concrete sawcutters. The remaining shell of the old RIPS will be filled with large non-erosive rock. Sediment control BMPs implemented and maintained during earlier construction phases will remain in place, as necessary. The turbidity curtain will minimize turbidity generated from the sawcutting. The cured concrete slurry is expected to be minimal and will likely settle out quickly in the backwater near the existing RIPS. The contractor's pollution control plan will require methods to contain or minimize saw cut slurry during this operation.

4.2.1.4.12 Phase 12: Demobilization and Restoration

For the most part, demobilization of equipment and materials will be ongoing as phases are completed during other activities involved with RIPS construction and channelization. Final demobilization of equipment during the third IWWP (2015) will include removal of the equipment used to remove the old RIPS structure, removal of the turbidity curtain, and removal of equipment at the street level staging area. No work is planned in the channelization area during the third IWWP.

Demobilization

Demobilization of the crane used to transport equipment down the embankment will occur following completion of all construction activities near the base of the RIPS. Implemented sediment control BMPs, including catch basin inserts, sediment fencing, and construction entrances, will remain in place during much of this phase of construction and will be removed after it is determined the site is stabilized.

Site Restoration

Some pavement restoration and replacement may be required as a result of the heavy equipment mobilization on the existing asphalt within the RIPS area. On-site civil work will include the installation of permanent landscaping and vegetation.

At the conclusion of RIPS construction activities, the installation of permanent vegetation will occur in the area adjacent to the RIPS access bridge. Permanent vegetation may be installed or incorporated from elevation 35 feet to elevation 47 feet (NGVD 29), which is above OHW. Temporarily disturbed areas will be restored with native vegetation in accordance with City of Gladstone code. Approximately 0.7 acre of off-site mitigation, including plantings and habitat restoration, are required by the City of Gladstone and will take place at Cross Park, approximately 1,500 feet upstream of the RIPS.

4.2.1.5 Fish Screen and Approach Velocity

The proposed intake screens are composed of three separated screens in a "tee" arrangement. Each screen is 36 inches in diameter with two baskets with a length of 42 inches each. Details of the screen are depicted in Appendix C, Figure 17. This configuration results in a total screen area of 197.9 square feet. The maximum diversion rate of 38 MGD results in an average approach velocity of 0.30 feet per second. Fixed internal baffling in the screens and automated brush cleaning provide balancing of the flow through the screens to prevent approach velocity from exceeding 0.30 feet per second. Channelization of the river bed upstream of the screens results in sweeping velocities at the new intake of 0.5 feet per second at the 95 percent river exceedance flow (660 cubic feet per second [cfs]) that occurs in September and 1.3 feet per second during typical summer flow (1,050 cfs). Without channelization, the sweeping velocity at the screens can at times be negligible or in an eddy condition. The screens can be raised and lowered to an upper work deck along tracks mounted flush into the face of the intake structure. The screens are placed 18 inches clear off the intake structure wall and 24 inches clear from the channel invert, and they maintain 30 inches of submergence below the 95 percent exceedance flow (660 cfs). All three screens combined displace approximately 11 cubic yards. The screens are cleaned by rotating through a pair of brushes, one fixed and the other rotating; when the screens reverse rotation, debris is discharged into the sweep of the river.

4.2.2 Raw Water Pipeline

4.2.2.1 Project Description

A new 42-inch-diameter RWP will be constructed to connect the new RIPS to the Lake Oswego WTP. The pipe will be sized to convey 38 MGD and will be approximately 14,000 feet long. The work is divided up into three segments: the RIPS to Meldrum Bar Park; Meldrum Bar Park to Oregon Parks and Recreation Department (OPRD) Property; and OPRD Property to the WTP (Appendix D, Figures 1 and 2).

4.2.2.1.1 Segment 1 South: RIPS to Meldrum Bar Park

RWP Schedule 1 South will be constructed entirely in uplands. From the RIPS facility, the pipeline will be installed towards the southwest on West Clackamas Boulevard, then proceed northwest on Bellevue Avenue. It will turn southwest on West Exeter Street, then cross Highway 99E, SE River Road, and continue southwest on Jensen Road. From there it will turn northwest through unpaved fields in Meldrum Bar Park for approximately 900 feet and then proceed southwest on Meldrum Bar Park Road to the staging area for the HDD bore under the Willamette River (Segment 2) near the base of the gravel bar near the Willamette River in Meldrum Bar Park. Segment 1 South includes approximately 7,700 lineal feet of pipeline.

4.2.2.1.2 Segment 2: Meldrum Bar Park to OPRD Property

The pipeline will cross the Willamette River in an HDD bore approximately 3,900 feet long and up to 60 feet below the river bed (Appendix D, Figure 3). The HDD bore exit staging area on the east side of the Willamette River will be on a gravel bar at Meldrum Bar Park. The HDD bore entry staging area on the west side of the Willamette River will be within two OPRD lots adjacent to the northern boundary of Mary S. Young State Park.

The staging area at Meldrum Bar Park will include 0.02 acre (900 sq. ft.) of temporary impacts to the Willamette River (below OHW, 15 feet) due to the need for a construction platform, made of ecoblocks and quarry spalls (2-4 inch crushed basalt rock without fines), to elevate the work area above the gravel bar that is exposed at low water (Appendix D, Figure 5). Appendix D figures reference the Section 404 OHW and Section 10 OHW. Use of "OHW" in this application refers to the Section 404 OHW at elevation 15 feet.

The proposed RWP enters into the City of West Linn within Mary S. Young State Park. The RWP will be approximately 40 feet below the surface at the point of entry into the West Linn land use jurisdiction. The RWP will then travel underground in a northerly direction into two parcels owned by the OPRD adjacent to the northern boundary of Mary S. Young State Park.. The HDD staging area is located on the northernmost of these parcels. The HDD bore will end approximately seven feet underground at this point and, thereafter, the RWP will be constructed, utilizing an open trench method, westward until it enters the Mapleton Drive right-of-way. There are no wetland impacts associated with the RWP alignment.

Overall Schedule

The Willamette River has two standard ODFW-approved IWWPs: July 1-October 31 and December 1-January 31. The HDD operation could take as long as 6 months to complete so it is expected that work will occur outside the standard in-water work window during 2014. Work will be scheduled so that the risk of high water is low (i.e. not winter) and stage equipment on dry ground or on temporary platforms raised above the OHW elevation (although temporary platform footings/steel pile may be below the OHW elevation).

Staging

The HDD entry and exit points have been carefully placed to minimize the risk of the crossing and to reduce construction impacts as much as possible to the park properties, the Willamette River, and surrounding wetlands. The Meldrum Bar site was selected as the exit side because it provided the only location from which the fully assembled pipe could be pulled into the HDD borehole without significant disruption to roads, parks, and nearby residents (Appendix D, Figure 5).

The HDD entry staging area on the western side of the Willamette River will be within the OPRD lots north of Mary S. Young State Park. This location will allow for construction accessibility while limiting impacts to Mary S. Young State Park and to park users (Appendix D, Figures 4 and 12).

OPRD Staging Area

Drilling equipment will be staged within the OPRD lots and right-of-way along Mapleton Drive while maintaining pedestrian access to Mary S. Young State Park and emergency access to the West Linn Pump Station. Access to nearby residents will also be maintained at all times. All drilling activities on the western side of the river will take place above the OHW elevation, and will be staged in such a way to limit impacts to roads, parks, and nearby residents as much as possible.

Meldrum Bar Park HDD Staging

The Meldrum Bar site is currently a degraded gravel bar used for vehicle parking and fishing access. This site was selected as the side from which to pull the pipe into the bore hole because it provided the only location where the fully assembled pipe could be pulled into the borehole without significant disruption to roads, parks, and nearby residents. A platform will be constructed on the shore of the Willamette River that will house the drilling equipment and all ancillary equipment needed at the Meldrum Bar Park Site (Appendix D, Figures 5 and 6).

All of the support equipment for the HDD at the Meldrum Bar site will be arranged on the platform that will elevate the work area to an elevation of 21 feet (Datum NGVD 29), with the exception of spare Baker Tanks that will be located at the edge of the site as shown in Appendix D, Figure 5. Should the Willamette River levels rise above elevation 21 feet, the Baker Tanks would be filled with drilling fluids from the mud plant on the platform and used to remove the drilling mud from the site. A crane would be mobilized to the site to assist in lifting the drilling equipment from the platform to the parking area where it would be removed from the site.

The platform will have a total surface area of 2,600 square feet and will be constructed out of ecology blocks in combination with quarry spalls or other suitable filler material. Total temporary fill volume will be approximately 219 cubic yards above elevation 15 and 82 cubic yards below OHW. Decking consisting of wooden planks will be placed on top in order to provide a solid base for the HDD equipment. Pile driving will not be required for platform construction.

Some work below the OHW elevation will be required in order to construct the platform. This work is anticipated to occur at or above an elevation of 13 feet. The contractor will begin monitoring water level in the Willamette River via internet gauge readings in mid-February to identify any projected period of at least one week when the water surface elevation will be far enough below elevation 13 feet (the lowest existing elevation of the construction pad location). When a sufficient period of low water occurs, the contractor will prepare the gravel bar, manually place the ecology blocks around the perimeter of the platform, and fill the platform with washed quarry spalls. Fish will be excluded from the area of the platform (a maximum of 900 square feet below OHW) during periods of discharge above OHW using beach seines.

The HDD exit location is at approximate elevation 17 feet, which is above the OHW level of 15 feet. A steel conductor casing will be used to extend the elevation of the exit location to 21 feet. The 60-inch conductor casing that will be placed at the exit will extend through the soils a distance of approximately 200 feet. The HDD will be constructed through this conductor casing to eliminate the potential for the drilling mud to escape into the soils or into the Willamette River.

Pipe Layout

The pipeline will likely be assembled off-site (in an upland location) to the full length to allow a continuous pull into the bore, reducing the risk of the pipe seizing. The contractor will tow the fully assembled length of pipeline up the river by use of tug boats. Once the pipe arrives at the Meldrum Bar Park site, several cranes located on the shore will assist the tugs to get the pipe rigged up and pulled onto pipe rollers that will be set up on the beach. The cranes will then pick up the pipe and line it up with the bore hole while the tug boats assist in moving the pipe on the shore. It may be necessary for a temporary barge to be placed at the edge of the river on which a large crane would be placed to assist in lifting the pipe onto the shore due to the weight of the pipe. However, it is envisioned that this barge would be on the river for a period of time of 48 to 72 hours. This work is expected to occur in the last 4 to 6 weeks of the extended IWWP.

A barge will be used as a crane platform to handle the pipe as it enters the conductor casing; this barge will be secured using two spuds, spuds will impact the ground at varying locations around the drill site. The ground at this location generally consists of large cobble.

Appropriate permits and clearances will be obtained from the Corps and US Coast Guard for transportation of the pipeline up the river and storing a barge at the Meldrum Bar Park site.

HDD Activity

Drilling will primarily take place from the western side of the Willamette River at an elevation above OHW elevation. During normal drilling operations, all drilling fluids will be contained within the drilling entry pit and within the bore. Drilling mud will be circulated and pumped to the soil separation plant where excavated soil will be separated from the drilling mud. The mud will then be pumped back down the borehole for drilling.

At the entry and exit locations, a conductor casing will be utilized to construct the drill. At the exit location at the Meldrum Bar Park site, this casing will protrude above the ground surface to elevation 21 feet (NGVD 29) to isolate the drill from the surrounding surface and the Willamette River. The casing elevation could be extended to further isolate the bore from increases in river levels. Alternatively, a cap could be welded across the conductor casing to seal the bore from the surrounding river should the water overtop the exit location. Installation of the conductor casing will be completed above the OHW.

HDD Erosion, Sediment and Pollution Control

A number of measures can be implemented at the Meldrum Bar operation should river levels rapidly and markedly fluctuate. These measures will not be required at the western HDD staging area as surface elevations in that location are well above water level. Possible protection measures at the Meldrum Bar staging area include:

- Isolate the bore hole by raising the elevation of the bore entry with an extension of the conductor casing.
- Locate Baker Tanks at the exit location should drill mud need to be removed from the bore near the ground surface in the event that flooding is eminent. In the event that a flooding event was imminent and some warning was given, the contractor would be required by specification to pump near surface drilling fluid to Baker Tanks, seal all tanks, and move any equipment or potential pollutants to higher ground.
- No stockpiling of excavated soils or mud ponds will be permitted. The contractor will be required to contain and clean up any mud spills immediately.
- Other provisions will be kept on site in the event of minor flooding or erosion and pollution control needs including sandbags, silt fence, hay bales, a vacuum truck, and spill response kits.

4.2.2.1.3 Segment 3: Western HDD Staging Area to WTP

The pipeline will continue from the OPRD lots to the Mapleton Drive right-of-way, and then northwest on Mapleton Drive to the WTP. Segment 3 includes approximately 2,100 lineal feet of pipeline.

4.2.2.1.4 RWP Construction and Erosion and Sediment Control Activities

The RWP Project will secure a 1200-C permit from ODEQ and additionally comply with the erosion and sediment control ordinances of the Cities of Gladstone and West Linn. No unpaved areas will be disturbed during construction of the RWP, except at Meldrum Bar Park and the western HDD staging in the vicinity of Mary S. Young State Park. The potential for sediment along the roadways will be addressed with BMP's to be sure that there is no discharge to the storm system. Standard construction BMPs for erosion and sediment control will be used throughout the length of the alignment. The contractor will install appropriate perimeter controls around the linear RWP construction areas, including storm inlet protection and sediment fencing where appropriate.

Prior to the start of construction, construction trailers, a designated area for construction worker parking, and locations for material storage and stockpiling will be established. Before construction begins, a pre-construction meeting will be held to train and inform construction personnel on erosion and sediment control BMPs. The designated RWP Project site area boundary will be described during the meeting. Following the meeting, Project sensitive areas will be identified and protected through the installation of perimeter controls, such as construction fencing.

In conjunction with the installation of perimeter controls, areas where natural vegetation is to be preserved will be identified specifically and flagged. Well defined construction site entrances will be constructed at key locations that are near ordinary high water marks and wetlands, such as HDD entry and exit points. The construction site entrances will be made up of wood curb ramps, gravel construction entrances, or other feasible applications. Use of wheel washes will be addressed in the 1200-C permit and the contractor's site-specific ESCP. Type V catch basin inserts will be installed at catch basins located within the RWP Project site area. Silt fencing will be installed above the OHW elevation. After initial erosion control measures are installed, heavy construction equipment will be mobilized at the site. Equipment to be mobilized on-site includes excavation equipment and HDD drill equipment. Activity zones for material loading and unloading and equipment staging are demarcated (Appendix D, Figures 5 and 6). Additionally, secondary containment and spill prevention BMPs will be implemented in surrounding areas where equipment mobilization (HDD drill assembly) and equipment transport will occur. The contractor will be responsible for submitting site specific ESCPs and PCPs.

4.2.2.2 Site Clearing and Grubbing

Site clearing and grubbing activities will occur within the construction limits identified by the installed perimeter controls and silt fencing. Removal of trees will occur as necessary. Such trees proposed for removal will be reflected in the landscaping plans and are considered to be necessary for construction access and facilitation of HDD operations. Removed soil and vegetated materials unsuitable for trench backfill and restoration will be hauled off-site upon removal and excavation, by direct loading onto dump trucks. Some soils, particularly those free of invasive plant material, may be stockpiled on-site or nearby for use as backfill material. When immediate hauling is not possible, materials stored on-site and stockpiled will be covered with plastic sheeting to prevent sediment discharge. Following ground cover thinning and any vegetation removal on steep slopes or along currently vegetated river bank, matting will be installed to minimize the risk of sloughing and bank erosion.

4.2.3 Water Treatment Plant

4.2.3.1 Project Description

The existing WTP will be upgraded and expanded from 16 to 38 MGD. Primary changes include conversion of the plant to ballasted flocculation clarification, ozonation followed by biologically active granular media filtration; a new, larger clearwell and Finished Water Pump Station (FWPS); mechanical processes to treat process waste streams and residual solids; and upgrades to chemical feed systems. No construction will occur in wetlands or waterways.

4.2.3.2 Construction and Erosion and Sediment Control Activities

The Project will secure a 1200-C permit from ODEQ and will also comply with the City of West Linn's erosion and sediment control ordinances. The WTP improvements will add 1.3 acres of impervious surface and temporarily disturb 2.3 acres of soil. Standard construction BMPs for erosion and sediment control will be used throughout the construction at the WTP. The contractor will install appropriate perimeter controls around the linear Project site area, including storm inlet protection and sediment fencing where appropriate. Stormwater from new impervious surfaces will enter the West Linn storm sewer system, which is managed under a National Pollutant Discharge Elimination System (NPDES) permit from ODEQ.

4.2.4 Finished Water Pipeline

4.2.4.1 Project Description

A new FWP will connect the WTP to the Waluga Reservoir facilities, including connections to the existing Lake Oswego water distribution system. The pipeline is approximately 36,000 feet long and ranges in size from 24 to 48 inches in diameter. The FWP is divided into three segments: WTP to Erickson Street; Erickson Street to Cabana Lane; and Cabana Lane to the proposed Waluga

Reservoir 2. These segments are described in the sections that follow. There are no wetland impacts associated with the FWP alignment.

4.2.4.1.1 Segment 1: Water Treatment Plant to Erickson Street

The recommended FWP alignment travels west from the WTP site on Mapleton Drive to ODOT Highway 43, and then north along the Highway 43 right-of-way to Laurel Street. The FWP then travels west on Laurel Street from Highway 43 to Erickson Street, then north on Erickson Street to the proposed HDD bore exit staging area, located at Erickson Street at McVey Avenue. Conventional open-cut construction methods will be utilized for these segments. The existing water distribution system will be interconnected with the new FWP pipeline as required.

4.2.4.1.2 Segment 2: Erickson Street to Cabana Lane

The 2,600-linear-foot HDD alignment will cross under several private properties, the southeast Arm of Oswego Lake, Kenwood Road, Lakewood Bay of Oswego Lake, and the Union Pacific Railroad (UPRR) corridor to an HDD bore entrance staging area located near the intersection of 5th Street and Cabana Lane (Appendix D, Figure 2).

4.2.4.1.3 Segment 3: Cabana Lane to Waluga Reservoir

The FWP alignment will continue from the HDD entrance staging area up 5th Street via open cut construction methods to Evergreen Street, then west on Evergreen Street, north on 10th Street, then west on Chandler Road to Iron Mountain Boulevard (Appendix D, Figure 2). The FWP alignment continues west along Iron Mountain Boulevard crossing over the Springbrook Creek culvert within the existing roadway, through the traffic circle and continuing west along Upper Drive. The FWP then turns north along Twin Fir Road, west on Douglas Circle and continues on Lanewood west to Boones Ferry Road.

The alignment then crosses Boones Ferry Road into Lake Grove Elementary School property and continues west and then north through the property onto SW Douglas Way, then north onto Quarry Road, and then west into the Waluga Park parking lot. From the parking lot, the alignment heads northwest through a steep, wooded area up to the existing Waluga Reservoir and the proposed Waluga Reservoir 2.

Approximately 1.1 acres of temporary impacts to unpaved upland forested areas will occur in the Waluga Park and Reservoir areas.

4.2.4.2 Construction and Erosion and Sediment Control Activities

The Project will secure a 1200-C permit from ODEQ and will also comply with the erosion and sediment control ordinances of the Cities of West Linn and Lake Oswego. No unpaved or gravel-surfaced areas will be disturbed during construction of the FWP, except at the HDD exit location, and the Waluga Park and Reservoir areas. Construction-related stormwater runoff will be managed in accordance with local codes. Standard construction BMPs for erosion and sediment control will be used throughout the length of the alignment. The contractor will install appropriate perimeter controls around the linear Project site area, including storm inlet protection and sediment fencing where appropriate.

4.2.5 Waluga Reservoir 2

4.2.5.1 Project Description

A new Waluga Reservoir 2, which will have 3.5 million gallons (MG) of storage, will be constructed of reinforced concrete alongside the existing Waluga Reservoir. No wetlands or waterways will be impacted by the construction.

4.2.5.2 Construction and Erosion and Sediment Control Activities

Construction of the new Waluga Reservoir 2 will temporarily disturb approximately 0.85 acres of ground. Of this, 0.56 acres will become impervious surface, 0.18 acres will be revegetated with native plantings, and an approximately 0.11-acre stormwater pond will be constructed. No wetland or waterway impacts are anticipated for this work. Standard construction BMPs for erosion and sediment control will be used for the Waluga Reservoir Project site area.

4.2.6 Bonita Pump Station

A new Bonita Pump Station (BPS) will be located in Tigard and will be capable of delivering 14 MGD of water supply to the Tigard water system, with provisions for future expansion to up to a 20-MGD capacity. The new pump station will be located at the northeast corner of Milton Court and Bonita Road on a parcel owned by the City of Tigard (Appendix D, Figure 15). Wetlands in the vicinity appear to be isolated, with no outlet or connection to other wetlands or waters. A piped creek (WR-17) runs through the BPS property. The BPS design will avoid permanent and temporary impacts to jurisdictional wetlands, waters and Clean Water Services-regulated wetland buffers.

4.2.6.1 Construction and Erosion and Sediment Control Activities

Ground disturbance will occur but will be stabilized upon project completion. Standard construction BMPs for erosion and sediment control and resource avoidance will be used for the BPS Project site area.

4.3 DISPOSAL AREA

Stockpiling of removed materials from below the OHW elevation or within wetlands and/or water resources will not be disposed of or stockpiled in these areas. Contract specifications will require that excavated material suitable for backfill be stockpiled above the OHW elevation and outside of wetlands and water resources, placed far enough from the excavation to prevent stability problems and covered with plastic sheeting to prevent sediment discharge. Stockpiled materials will be shaped so as to cause the least possible interference with construction operations and drainage.

Contract specifications will also require that excavated material unsuitable for backfill be disposed of off-site and will likely be transported off-site via dump trucks. At Meldrum Bar, material may be loaded onto barges in the Willamette River and shipped off-site. If unsuitable material is transported off-site via dump trucks, Clackamas Sand & Gravel in Clackamas, Oregon (12000 SE Capps Road) and Meisel Rock Products in McMinnville, Oregon, are potential disposal sites. The Clackamas Sand & Gravel site could be used for disposal of clean excavated spoils that could be worked for engineered fill. The Meisel Rock Products facility served as the disposal site for a similar and recent HDD project in the Portland metropolitan area. If unsuitable material is shipped off-site via barges, PPV Inc. is a potential disposal site; PPV Inc. is located right along the Willamette River on NW Front Avenue in Portland.

4.4 ENDANGERED SPECIES ACT AND ESSENTIAL FISH HABITAT CONSULTATION

No federally listed plant or terrestrial wildlife species or their habitats were observed during the field reconnaissance. Potential impacts to the following aquatic species and their habitat are addressed by the Project's Biological Assessment: Upper Willamette River (spring) Chinook (threatened), Lower Columbia River (fall) Chinook (threatened), Lower Columbia River (winter) steelhead (threatened), Lower Columbia River coho (threatened), Bull trout (threatened; recent re-introductions could extend this species' range into the Project area), and Pacific lamprey (not currently listed; growing concern about population declines and potential for future ESA listing).

These aquatic species have been identified through agency consultation and site-specific records of ESA-listed species that are available from the Oregon Biodiversity Information Center (ORBIC) as the special status species associated with the construction of the Project (referred to as the "proposed action").

The Biological Assessment has been prepared as a tool for coordination between those agencies responsible for the administration of the ESA, and in compliance with Section 7 of the ESA. It will be used by the Corps to develop its finding of effect and National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) will develop a letter of concurrence or Biological Opinion (BiOp) for the proposed Project based on the Biological Assessment and other information provided by the Oregon Department of Fish and Wildlife (ODFW) and other local sources.

After evaluating the potential effects and available scientific and commercial data, the Biological Assessment states that the proposed action is *"likely to adversely affect"* the following five Evolutionarily Significant Units (ESUs)/Distinct Population Segments (DPSs) of federally listed salmonids known to occur in the vicinity of the proposed action:

- Lower Columbia River Steelhead (*Oncorhynchus mykiss*)
- Lower Columbia River Chinook Salmon (*Oncorhynchus tshawytscha*)
- Upper Willamette River Steelhead Trout (*Oncorhynchus mykiss*)
- Upper Willamette River Chinook Salmon (*Oncorhynchus tshawytscha*)
- Lower Columbia River Coho Salmon (*Oncorhynchus kisutch)*

The proposed action will have no direct effect on bull trout (*Salvelinus confluentus*), because none are currently present in the RIPS and RWP action areas. The proposed Project would not result in the *"destruction or adverse modification"* of designated critical habitat.

The potential Direct, Indirect, and cumulative effects of the proposed Project "may adversely affect" identified Essential Fish Habitat (EFH) in the short term for the RIPS and RWP action areas evaluated, based on consideration of the EFH requirements of the Coastal Pelagic Species (CPS) fishery, West Coast groundfish fishery, and the Pacific coast salmon fishery. No adverse long-term effects on EFH are anticipated. It is expected that the conservation measures described herein are also applicable to EFH and would satisfy the requirements pursuant to Section 305(b)(4)(A) of the Magnuson-Stevens Fishery Conservation and Management Act.

The Project Sponsors have prepared a Preliminary Draft Biological Assessment for pre-application discussions with NMFS, ODFW, and other regulatory agencies. The draft Biological Assessment is available upon request.

4.5 CULTURAL RESOURCE RECONNAISANCE

Archaeological Investigations Northwest, Inc. (AINW) has completed a cultural and environmental context, background review, screening of geotechnical boring sediment samples, and a cultural resource reconnaissance survey for the proposed Project. AINW findings include the following:

4.5.1 Archaeological Resources

A pedestrian survey of the APE resulted in the identification of one archaeological resource, a historic-period quarry site (10/1847-1) in Lake Oswego. AINW recommends that the site be revisited and recorded prior to project construction. In combination with the literature review and borehole screenings, the survey identified 15 areas with a high probability to contain subsurface archaeological deposits that would be directly impacted by the project as proposed. These high probability areas, HPA-1 through HPA-15, are recommended for additional work in the form of subsurface testing, archaeological monitoring during ground disturbing activities, or a combination of both.

While portions of the permit impact area for the Lake Oswego Water Treatment Plant expansion were surveyed for archaeological resources, landowner access issues prevented AINW from surveying this area in its entirety. AINW recommends that inaccessible areas should be surveyed once permission to access the land is granted to ensure that surface artifacts are not present prior to project construction. Subsurface testing of the area may be recommended dependent upon the results of the pedestrian survey.

4.5.2 Historic Resources

To determine the NRHP-eligibility of historic resources located on land parcels crossed by the APE, AINW recommends that a Section 106 database be prepared for SHPO review and concurrence. The database will include a recommendation of eligibility for each of the six previously unrecorded resources (HR-1 through HR-4, HR-6, and HR-7), and will also address potential impacts to the NRHP-listed Lake Oswego Hunt Club Ensemble (HR-5) and any additional resources determined to be NRHP-eligible. Potential impacts will be categorized as having "No Effect," "No Adverse Effect," or an "Adverse Effect" on the character-defining features of NRHP-eligible and listed resources. Avoidance of adverse effects is recommended, as adverse effects to NRHP-eligible resources require resolution through additional consultation under Section 106 of the NHPA. Resources determined to be not eligible for listing in the NRHP will require no further work or consideration for the project to proceed as planned.

5 PROJECT IMPACTS AND ALTERNATIVES

5.1 ALTERNATIVES ANALYSIS

A detailed Alternatives Analysis has been prepared for the JPA that evaluates all elements of the Project. The analysis is included as Appendix F of this application. The proposed Project is the only alternative that meets the Project Sponsors' objectives of providing an adequate, safe, reliable, long-term, acceptable, and affordable regional water supply to Lake Oswego and Tigard, both for current demands and for the anticipated growth in demand forecast to occur over the 30-year planning horizon. Water supply source reliability is ensured for both Lake Oswego and Tigard through the ownership of their water supply. The proposed Project would also be the most acceptable to the communities that it serves because the Clackamas River is an excellent source of high quality raw water and new infrastructure would replace unreliable and obsolete facilities at the lowest net present value of all alternatives considered.

The proposed Project will reliably serve the needs of both communities for the long term and can be fully operational by the expiration of Tigard's contract with Portland on June 30, 2016.

The construction methods, construction timing, and alignment details have been developed to minimize environmental impacts by avoiding waters and geologically unstable areas and by boring major crossings to the extent practicable.

5.2 MEASURES TO MINIMIZE IMPACTS

5.2.1 Erosion, Sediment, and Pollution Control

The erosion, sediment, and pollution control plans are intended to address all aspects of construction. The general outline of the plans is presented in Section 4 above. A detailed ESCP is included in Appendix E. While the ESCP is specific to the RIPS site, it is currently presumed that all BMP's discussed in the ESCP are applicable to the RWP and FWP portions of the project and will be applied as necessary. Construction contractors will responsible for developing their own site-specific ESCP and PCP for separate segments of the project. It is presumed that the ESCP included in Appendix E will be used as a basis for their site-specific plans. The project will comply with all state and federal permit requirements pertaining to erosion, sediment, and pollution control.

5.2.2 Work Area Isolation at RIPS

The work area at the RIPS will be isolated from the Clackamas River to protect fish and water quality. Natural areas will be preserved, where possible, to maintain soil stability.

5.2.3 Wetland and Waters Avoidance

The RWP and FWP alignment was chosen to avoid wetland and waters impacts. As identified in Table 2, all drainages, including Springbrook Creek, will be avoided along the pipeline routes by placing the pipeline beneath the existing road surface.

5.2.4 HDD Technology

The HDD exit point was chosen to minimize the installation risk of the crossing and to reduce construction impacts as much as possible to the park properties, the Willamette River, and surrounding wetlands. HDD technology significantly reduces impacts to water resources using precision tunneling under them while allowing relatively minor impacts at the entry and exit areas. HDD is a three-phase process consisting of drilling a pilot bore, reaming the bore to reach the design diameter, and pulling the product pipe into the reamed bore. The process begins with the preparation of the site, including setup and positioning of the HDD rig. Once the site is fully prepared, drilling begins. During the first drilling phase, the pilot bore is drilled by a steerable bit with its position along the alignment measured using a remote tracking system. In the second phase, a reamer is advanced through the pilot bore multiple times to increase the diameter of the bore to a size suitable to accept the designed pipeline.

HDD technology utilizes pressurized drilling fluids at all stages of the drilling process that are continuously pumped through the drilling equipment, and are used to stabilize the bore, cool the cutting tools, lubricate the drill pipe, and transport soil cuttings back to the entry location. The fluids are composed of a mixture of water and drilling fluid additives, primarily bentonite. Bentonite is a nontoxic, naturally occurring clay mineral that is formed by the chemical alternation of volcanic ash.

When drilling fluid is pumped into the bore, it is prevented from flowing into the native soil formation by bentonite platelets, plate-shaped particles that plaster to the walls of the borehole and form a filter cake that seals off the bore. The filter cake both reduces the migration of drilling fluid into the surrounding soil and groundwater, and reduces the intrusion of groundwater and soil into the bore. Any fluid that does manage to filter through the cake will be clean water, because the clay platelets will adhere to the existing filter cake and remain behind to strengthen the seal. Because of the tight seal that the filter cake creates, the drilling fluid is restricted to the borehole and does not impact the surrounding groundwater under normal conditions.

Although drilling fluid is nontoxic and is typically 97 to 99 percent water, it is still important to reduce the risk of hydrofracture through proactive design and good construction practices. In most cases, this involves designing the bore to have sufficient depth and overburden to resist the drilling fluid pressure, or limiting by specification the allowable drilling pressures that the HDD contractor may utilize. In shallow areas in the vicinity of the entry or exit locations, conductor casings will be used to support the borehole, conducting all drilling fluid back to the surface through the casing and completely mitigating the risk of hydrofracture above the bore.

5.3 DESCRIPTION OF WETLAND AND WATER RESOURCES IN PROJECT AREA

5.3.1 Wetland and Water Resources

Thirty-one waters of the state or U.S. were identified within the Project area. These included 10 wetlands and 21 non-wetland waters (e.g., creeks, rivers, and lakes). Wetlands in Table 3 include those that may be jurisdictional to the Corps and/or the Department of State Lands (DSL). The 21 waters in Table 4 include water resources that may be jurisdictional or non-jurisdictional features. Each of these features is described in more detail in the Project's wetland delineation report prepared by David Evans and Associates, Inc.

Table 3. Wetlands Summary Table

Table 3. Wetlands Summary Table				
Wetland	**Acres in Study Area**	**Cowardin Class**	**HGM Class**	**Connection to Other Waters**
A	2.32	PEM/ PSS/PFO	RFT	Directly abuts and has a seasonal surface water connection to Willamette River during annual flooding.
B	<0.01	PEM	S/F	Seasonal surface water connection to ephemeral stream WR-3.
C	0.03	PFO	RI	Seasonal surface water connection to WR-15 via culvert under Iron Mountain Blvd. during wet season.
D	0.02	PFO	S/F	No surface water connection to other waters. Isolated.
E	2.59	PEM/ PSS	S/F	Surface water connection via culverts under Iron Mountain Blvd. to Wetland F.
F	0.34	PFO	S/F	Surface water connection to Springbrook Creek.
G	0.13	PEM	S/F	Seep drains to catch basin, with no connection to other waters.
H	0.28	PFO	S/F	Isolated.
I	0.07	PEM	S/F	Surface water connection to Fanno Creek via culvert under the wetland.
J	0.01	PEM	S/F	Isolated.
Total	**5.79**			

Notes: PEM = palustrine emergent; PSS = palustrine scrub-shrub; PFO = palustrine forested, RFT = riverine flow-through; S/F = slope/flat, RI = riverine impounding;

Table 4. Other Waters Summary Table

Table 4. Other Waters Summary Table (Measurements in feet unless noted otherwise.)						
Feature ID	**Approx. Depth to OHW (feet)**	**Avg. Width at OHW (feet)**	**Acres in Study Area**	**Fish Present?[1]**	**Substrate**	**Estimated Flow Duration**
Clackamas River	Unknown	250	1.09	Yes	Silt, sand, cobble, boulder, bedrock	Perennial
Willamette River	Unknown	1,000	7.80	Yes	Silt, sand, gravel, cobble	Perennial
WR-1	6	4	0.02	Likely	Silt, sand, cobble	Perennial
WR-2	0.5	3	0.03	Likely	Silt, sand	Perennial
WR-3	1	1.5	0.03	Unlikely	Clay, silt, sand	Intermittent
WR-4	2	3	<0.01	Likely	Silt, gravel, cobble	Perennial
WR-5	2	3	<0.01	Likely	Silt, gravel, cobble	Perennial
WR-6	2	5	<0.01	Yes	Silt, gravel	Intermittent
WR-7	0.5	3	<0.01	Unknown	Gravel, cobble	Intermittent
WR-8	0.5	3	<0.01	Unknown	Silt, gravel	Intermittent
WR-9	1	3	<0.01	Unknown	Silt, gravel	Intermittent
WR-10	1	4.5	<0.01	Yes	Silt, gravel, cobble	Intermittent

Table 4. Other Waters Summary Table (Measurements in feet unless noted otherwise.)						
Feature ID	**Approx. Depth to OHW (feet)**	**Avg. Width at OHW (feet)**	**Acres in Study Area**	**Fish Present?[1]**	**Substrate**	**Estimated Flow Duration**
WR-11	4 inch	1	<0.01	Unknown	Silt, gravel	Intermittent
WR-12	4 inch	4	<0.01	Unknown	Silt, gravel	Intermittent
WR-13	4 inch	2	<0.01	Unknown	Silt, gravel	Intermittent
Oswego Lake	Unknown	400	2.12	Yes	Clay, silt	Perennial
WR-14	1.5	6	<0.01	Unknown	Gravel, cobble	Perennial
WR-15	4	1	<0.01	Likely	Gravel, cobble	Perennial
Springbrook Creek	1.5	12	0.01	Yes	Gravel, cobble	Perennial
WR-16	1.5	0.5	<0.01	Unlikely	Silt	Intermittent
WR-17	10 inch	1.5	<0.01	Unlikely	Silt, cobble fill	Intermittent

[1] Fish presence determination based on Oregon Department of Forestry Fish Presence/Absence GIS data and best professional judgment. ("Yes", "No", or "Unknown" based on ODF data. "Likely" or "Unlikely" based on best professional judgment due to either an absence of ODF data or site specific conditions that contradict ODF reach level data.

5.3.2 Biological Resources (Fish, Plants)

No federally listed plant or terrestrial wildlife species or their habitats were observed during the field reconnaissance. The tables below indicate species present in the Clackamas River and Willamette River in the vicinity of the Project.

Table 5. Clackamas River Aquatic Species Presence and ESA Listing Status

Table 5. Clackamas River Aquatic Species Presence and ESA Listing Status			
Common Name	**Scientific Name**	**ESU or DPS**	**Status**
Chinook Salmon	*Oncorhynchus tshawytscha*	Upper Willamette River	Threatened
		Lower Columbia River	Threatened
Steelhead Trout	*Oncorhynchus mykiss*	Lower Columbia River	Threatened
Coho Salmon	*Oncorhynchus kisutch*	Lower Columbia River	Threatened
Bull Trout	*Salvelinus confluentus*	Columbia River	Threatened
Pacific Lamprey	*Lampetra tridentata*	N/A	Federal species of concern

The mainstem Clackamas River, and especially the lower river where the RIPS is located, is primarily a migration corridor for ESA-listed salmon and steelhead.

Table 6. Willamette River Aquatic Species Presence and ESA Listing Status

Table 6. Willamette River Aquatic Species Presence and ESA Listing Status

Common Name	Scientific Name	ESU or DPS	Status
Chinook Salmon	*Oncorhynchus tshawytscha*	Upper Willamette River	Threatened
		Lower Columbia River	Threatened
Steelhead Trout	*Oncorhynchus mykiss*	Lower Columbia River	Threatened
		Upper Willamette River	Threatened
Coho Salmon	*Oncorhynchus kisutch*	Lower Columbia River	Threatened
Pacific Lamprey	*Lampetra tridentata*	N/A	Federal species of concern

The Willamette River in the vicinity of the Project serves primarily as a migration corridor for all of the special-status species that spawn and rear in the Clackamas River, as well as populations of Pacific lamprey, Chinook salmon, and steelhead trout that ascend to tributaries above Willamette Falls. However, although this reach is primarily a migration corridor, juvenile Chinook salmon rearing has been documented within the action area. This reach is also within the boundaries of the endangered Oregon chub (*Oregonichthys crameri*) DPS. Oregon chub were historically present in the vicinity, but no known populations are currently present within or near this reach of the Willamette River. Therefore, it is concluded that the Project would have "no effect" on Oregon chub.

5.3.3 Existing Navigation, Fishing, and Recreational Use

Clackamas River – The Lake Oswego RIPS is located approximately 0.8 miles upstream from the confluence of the Clackamas and Willamette Rivers on the lower Clackamas River. The Clackamas River is navigable under state and federal law. Small recreational craft utilize this area of the river for fishing and boating. Because of the isolation measures, these users are unlikely to be affected.

Willamette River – The Willamette River near the RWP HDD crossing is navigable under state and federal law. Uses of the river in this area include water skiing, fishing, recreational boating, and possibly swimming. Floating the 3,900-foot pipeline upstream from the manufacture site to the project site using tug boats is likely to temporarily affect all users during transportation. Once at the site, the pipe will likely be staged along the east bank of the Willamette River for the 24 to 72 hours it takes to pull the pipe into the bore hole.

The proposed staging area at Meldrum Bar Park, which is often used by fishermen, will be off-limits to all public uses during the 5 to 7 month HDD operation. The adjacent boat ramp and parking area will remain open.

Oswego Lake –Access is restricted to adjacent and nearby property owners with easements. The lake is used primarily for swimming and boating and limited hydropower production. Uses will not be affected as a result of the project.

Wetlands and creeks – With the exception of the above-listed waters, creeks along this linear Project are small, non-navigable waterways and do not provide fishing or other recreational uses. Wetlands are either located within public road right-of-way or are on private lands and do not provide recreational opportunities available to the general public.

5.4 SITE RESTORATION/REHABILITATION

Installation of permanent vegetation will occur in conjunction with on-site vegetation restoration activities. New landscaping will be planted in conjunction with final design guidelines and criteria. Standard industry practices to minimize erosion will be in place during construction, tree roots will be protected to the extent practicable, and temporary disturbance in vegetated areas will be minimized to the extent practicable.

5.4.1 RIPS

The new RIPS will impact approximately 1,500 square feet of upland riparian habitat. To compensate for impacts related to the new structure, the existing concrete intake pump station will be removed down to two feet above surface grade. No bank protection related to the Project will occur below OHW.

Mitigation for the removal of nine trees, six inches DBH or greater, in the riparian zone above OHW will occur as part of the City of Gladstone land use permit. Mitigation is still being evaluated but will entail native tree and shrub plantings at the RIPS property and at Cross Park. Cross Park, operated by the City of Gladstone, is located approximately 1,500 feet upstream of the RIPS property.

Although not specifically required for the JPA, City of Gladstone required mitigation may serve multiple purposes by meeting requirements for ESA mitigation requirements for NMFS, land use permit requirements for local jurisdictions, and site restoration requirements for the Clean Water Act and Oregon's Removal/Fill law.

5.4.2 RWP

Temporary impacts below the Section 404 OHW elevation (elevation 15) of the Willamette River are expected to be limited to 900 square feet (0.02 acre). This area consists of a gravel bar, often used as a parking area for anglers. Site restoration will occur at this location, and will consist of returning gravel bar areas back to their preconstruction conditions (i.e., contours and substrate). Within the limits of the Project at Meldrum Bar Park, the riparian zone (i.e., areas above OHW) consists of a paved parking lot. This area will also be restored to its paved condition following construction.

Revegetation of upland riparian areas will also occur in accordance with City of West Linn code requirements.

5.4.3 FWP

The alignment has been changed from the original alignment and will avoid impacts to Wetland E and Springbrook Creek. Impact avoidance has occurred by aligning the wetland crossing along the existing roadway.

5.4.4 Bonita Pump Station

No permanent or temporary impacts to wetlands or other jurisdictional waters will occur at this site. Upland areas temporarily disturbed during construction will be seeded with a suitable erosion control seed mix.

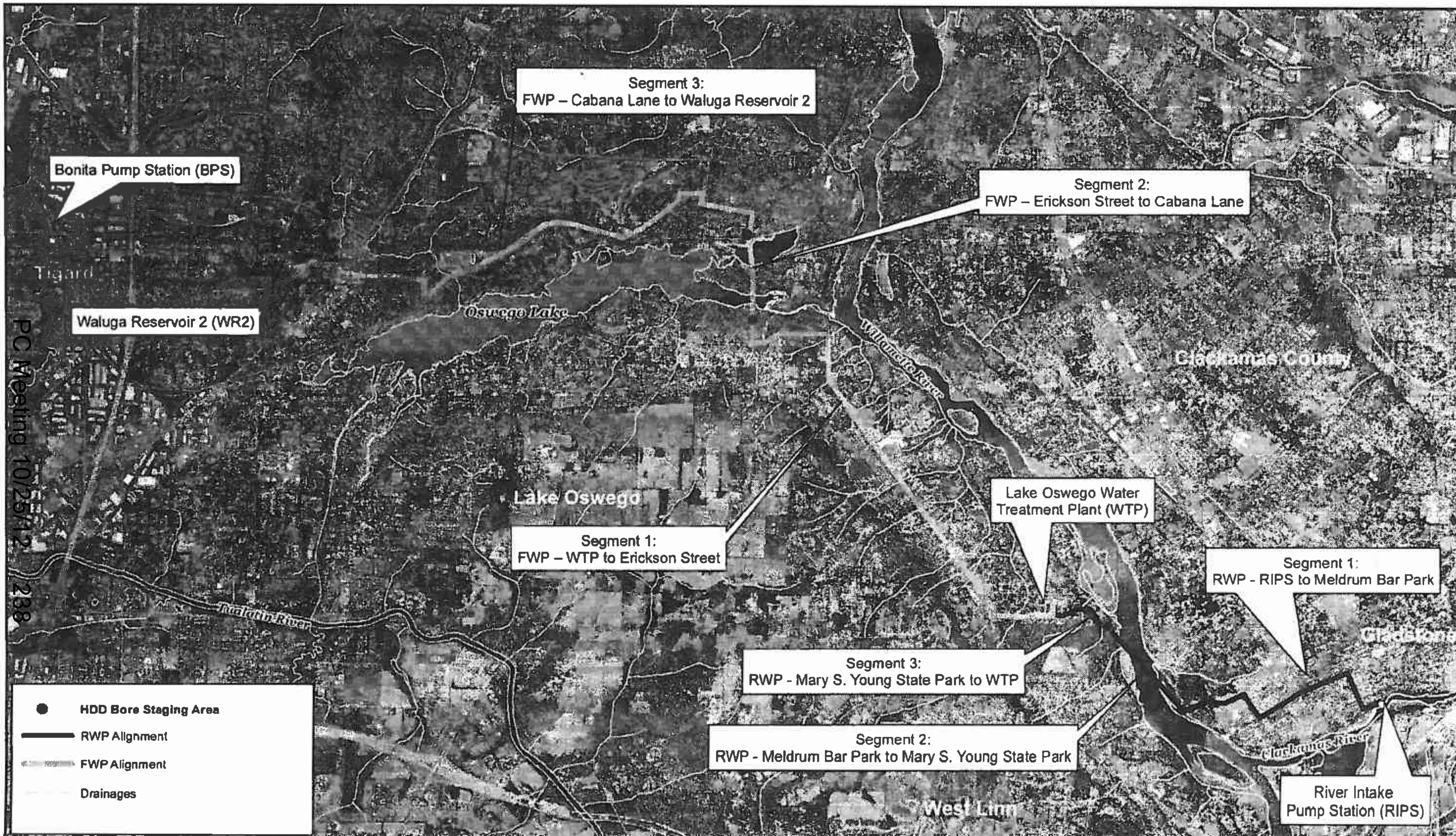
The BPS site is within Clean Water Services' (CWS) jurisdiction. Potential temporary impacts to vegetated corridors (i.e. wetland buffers) will be mitigated in accordance with CWS requirements. Existing degraded vegetated corridors will also be improved in accordance with CWS requirements.

5.5 MITIGATION

There are no permanent or temporary wetland impacts along the RIPS, RWP, and FWP alignments or at the Bonita Pump Station site; therefore, no wetland mitigation is proposed for this project. Potential temporary impacts to CWS vegetated corridors (i.e. wetland buffers) will be mitigated in accordance with CWS requirements.

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

APPENDIX B: OVERVIEW MAP



Lake Oswego · Tigard Water Partnership
sharing water · connecting communities

Figure 1
Project Elements

N

0 2,500 5,000 Feet

Brown AND Caldwell

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

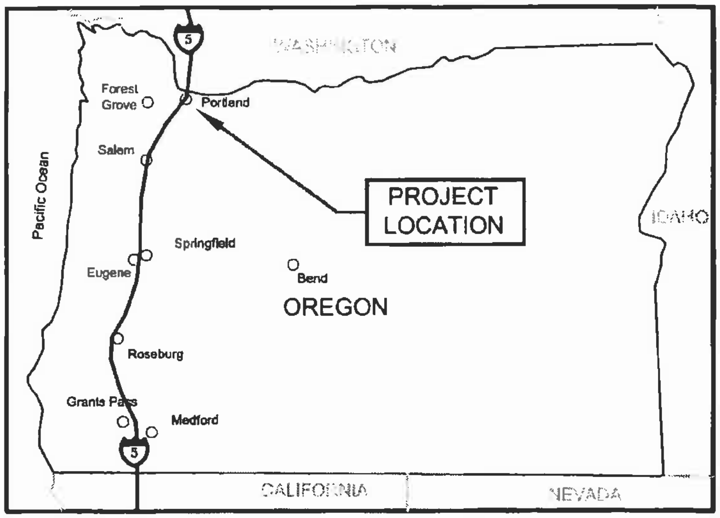
Appendix C: RIPS Drawings and Figures

LAKE OSWEGO - TIGARD - WATER PARTNERSHIP

PUMPING AND STORAGE COMPONENTS

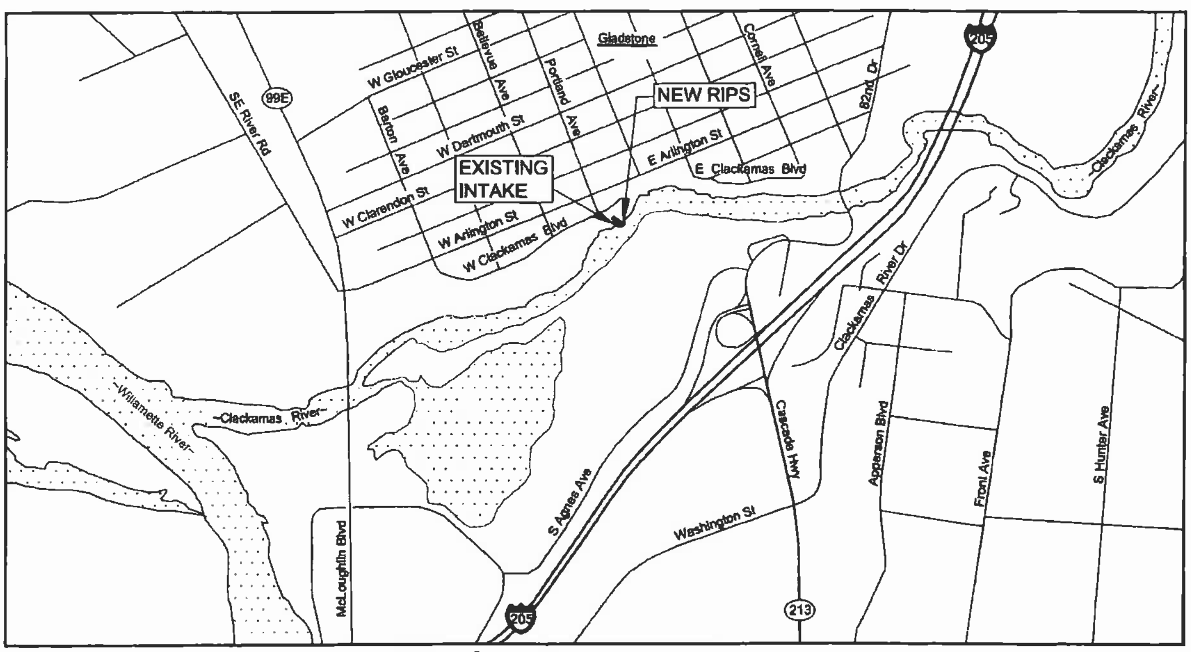
RIVER INTAKE PUMP STATION

WORK ORDER NO. 204-6
BLACK & VEATCH NO. 175033
FEBRUARY 23, 2012



NORTH

LOCATION MAP
NO SCALE



NORTH

VICINITY MAP
NO SCALE

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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Building a world of difference.
Black & Veatch Corporation
Portland, Oregon

5885 MEADOWS ROAD, SUITE 700
LAKE OSWEGO, OREGON 97035
TEL (503) 443-4400
FAX (503) 443-4499

LOTWP
RIPS
GENERAL
LOCATION AND VICINITY MAP

SCALE			
REV DATE	BY	CHK	APP

DWG NO	REV
FIGURE 1	0

NORTH

EXISTING SITE PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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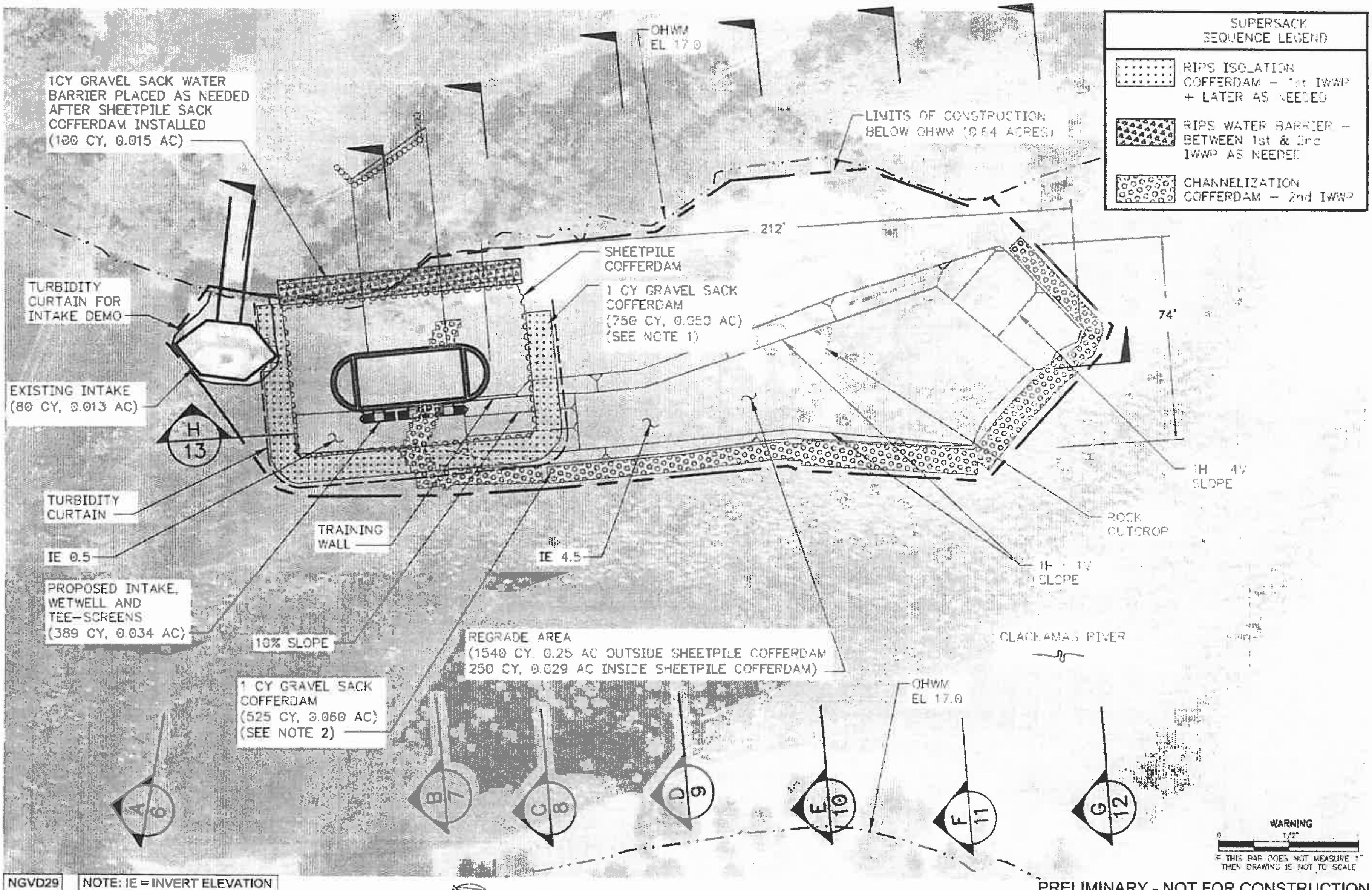
FAX (503) 443-4499

LOTWP
RIPS
GENERAL
EXISTING SITE PLAN

FIGURE 2 | C



PRELIMINARY - NOT FOR CONSTRUCTION

NOTES:
1. COFFERDAM WILL REMAIN IN PLACE UNTIL SHEETPILE COFFERDAM IS INSTALLED.
2. COFFERDAM WILL BE IN PLACE DURING THE SECOND IN-WATER WORK PERIOD FOR CHANNELIZATION WORK.

NORTH

OVERALL SITE PLAN

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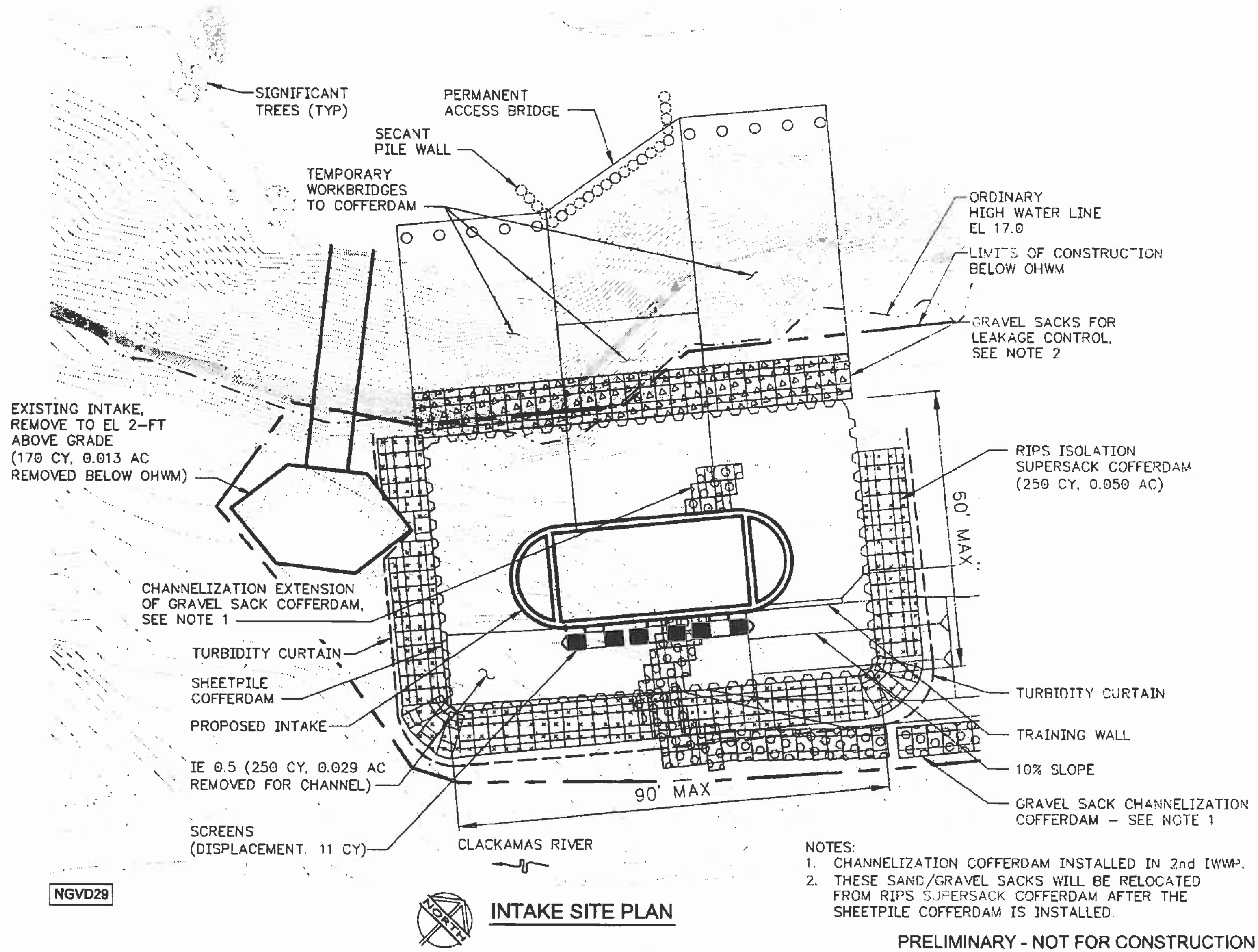
LOTWP
RIPS
GENERAL
OVERALL SITE PLAN

FIGURE 3 | REV 0



INTAKE SITE PLAN

NOTES:
1. CHANNELIZATION COFFERDAM INSTALLED IN 2nd IWWP.
2. THESE SAND/GRAVEL SACKS WILL BE RELOCATED FROM RIPS SUPERSACK COFFERDAM AFTER THE SHEETPILE COFFERDAM IS INSTALLED.

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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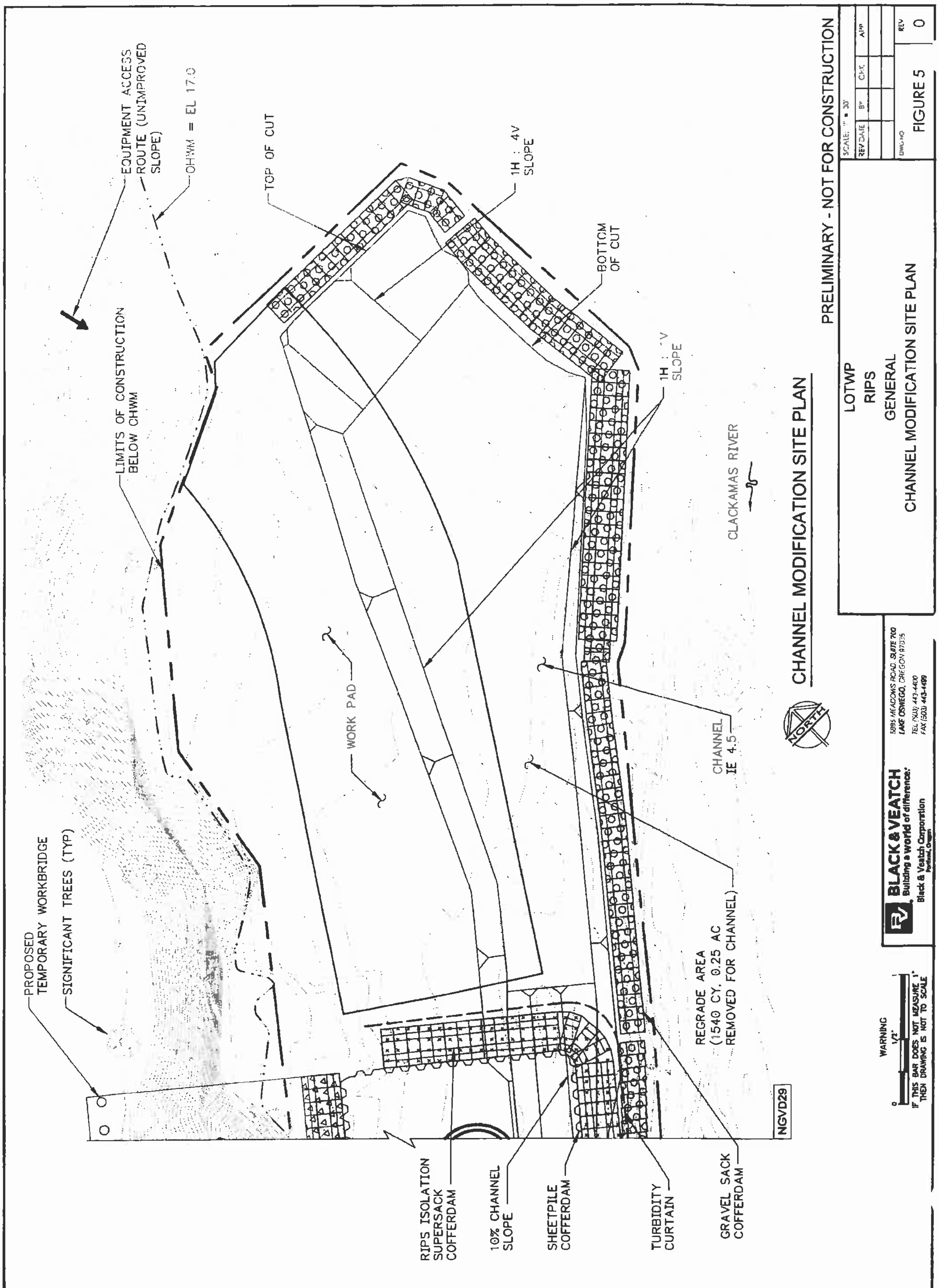
TEL (503) 443-4400
FAX (503) 443-4499

LOTWP
RIPS
GENERAL
INTAKE SITE PLAN

SCALE: 1" = 30'

REV DATE	BY	CHK	APP

DWG NO	REV
FIGURE 4	0



EQUIPMENT ACCESS ROUTE (UNIMPROVED SLOPE)
OHWM = EL 17.0
TOP OF CUT
1H : 4V SLOPE
BOTTOM OF CUT
1H : 1V SLOPE
LIMITS OF CONSTRUCTION BELOW OHWM
CLACKAMAS RIVER
WORK PAD
CHANNEL IE 4.5
PROPOSED TEMPORARY WORKBRIDGE
SIGNIFICANT TREES (TYP)
REGRADE AREA (1540 CY, 0.25 AC REMOVED FOR CHANNEL)
NGVD29
RIPS ISOLATION SUPERSACK COFFERDAM
10% CHANNEL SLOPE
SHEETPILE COFFERDAM
TURBIDITY CURTAIN
GRAVEL SACK COFFERDAM
CHANNEL MODIFICATION SITE PLAN
NORTH
PRELIMINARY - NOT FOR CONSTRUCTION
LOTWP
RIPS
GENERAL
CHANNEL MODIFICATION SITE PLAN
FIGURE 5
REV
0
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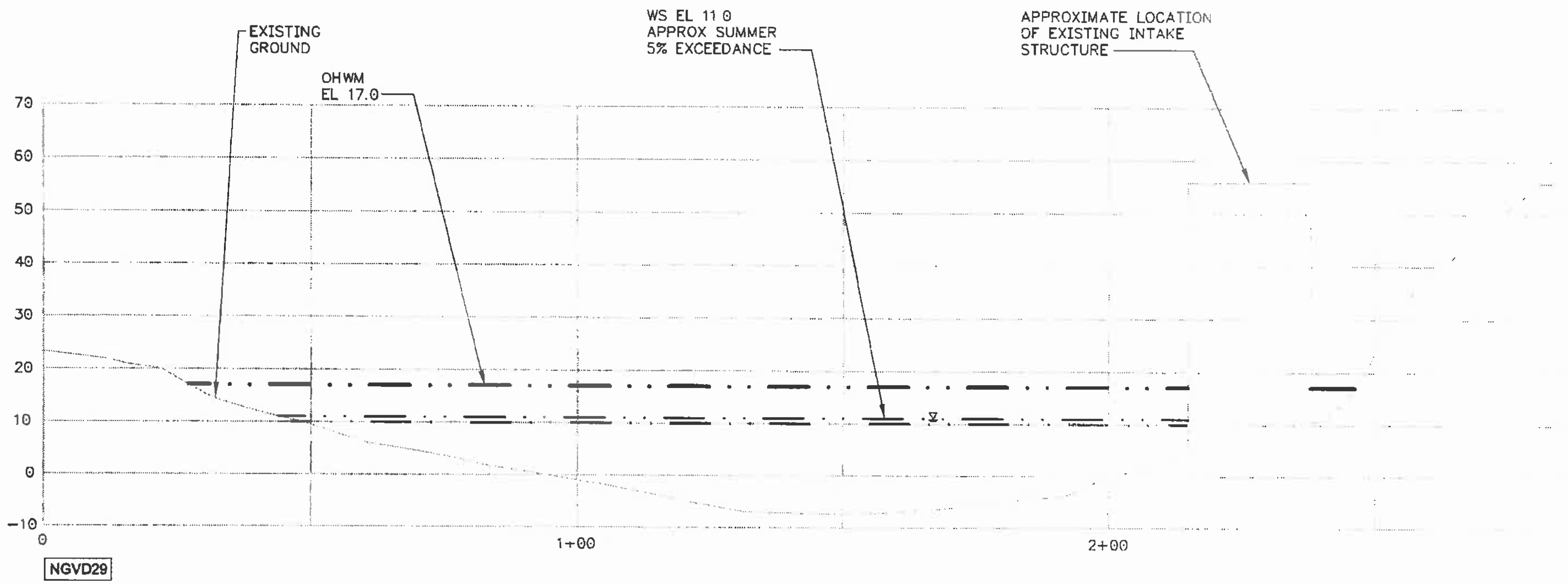
TEL (503) 443-4400
FAX (503) 443-4499
WARNING
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE



SECTION A/3

WARNING
0 1/2" 1
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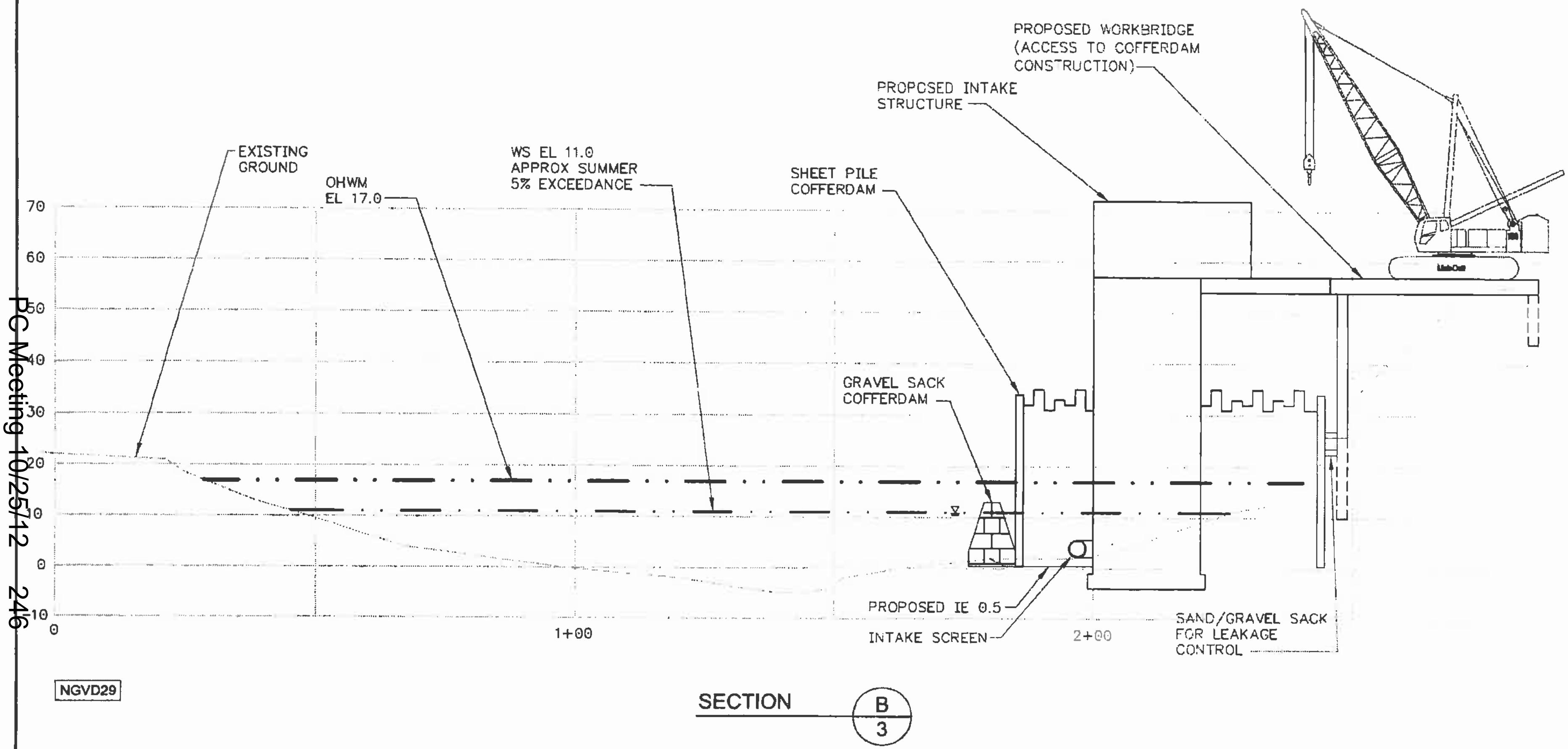
PRELIMINARY - NOT FOR CONSTRUCTION

LOTWP
RIPS
GENERAL
SECTION A

SCALE: 1" = 30'

REV DATE	BY	CHK	APP

FIGURE 6
REV 0



SECTION B/3

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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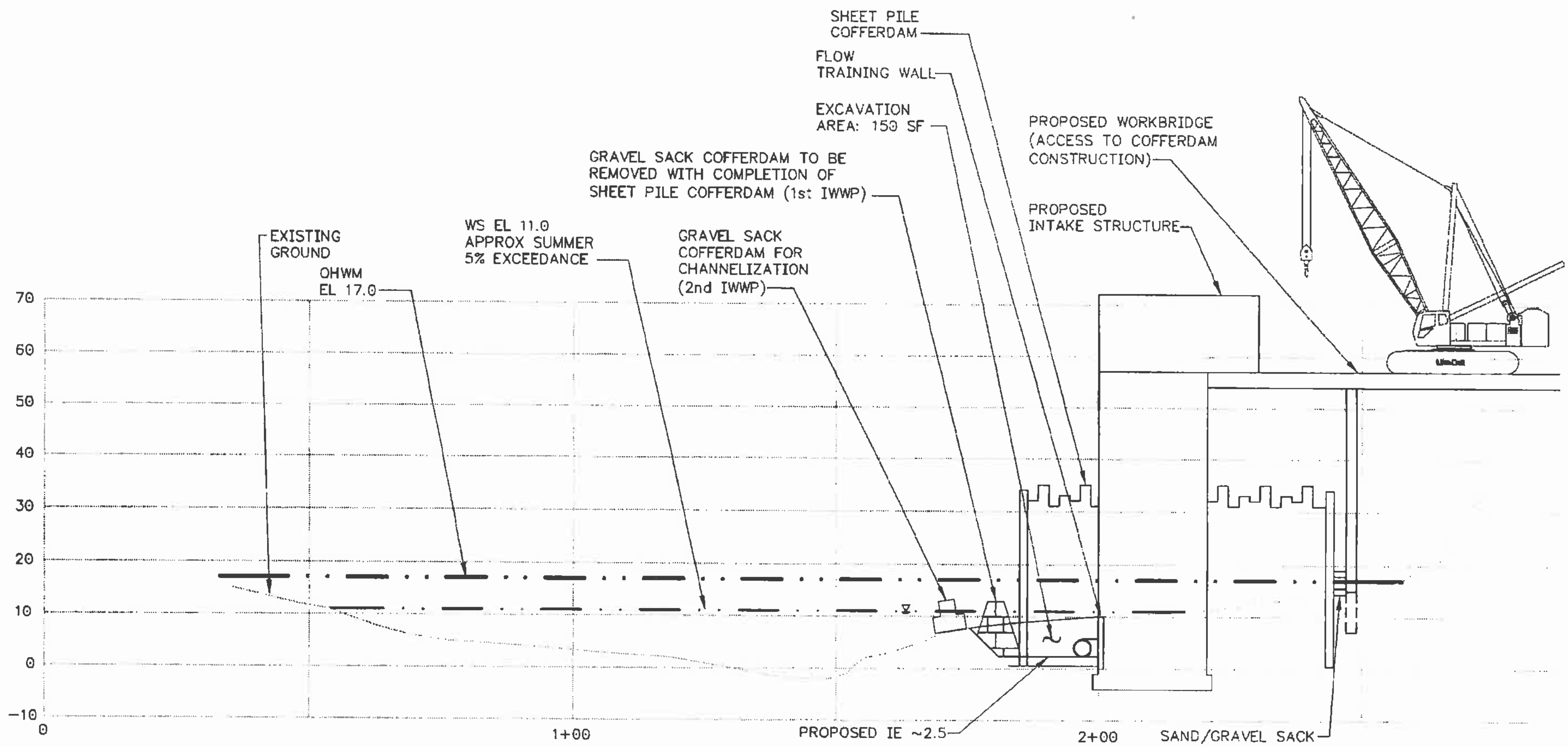
LOTWP
RIPS
GENERAL
SECTION B

SCALE 1" = 30'

REV	DATE	BY	CHK	APP

DWG NO. FIGURE 7 REV 0



SECTION C/3

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
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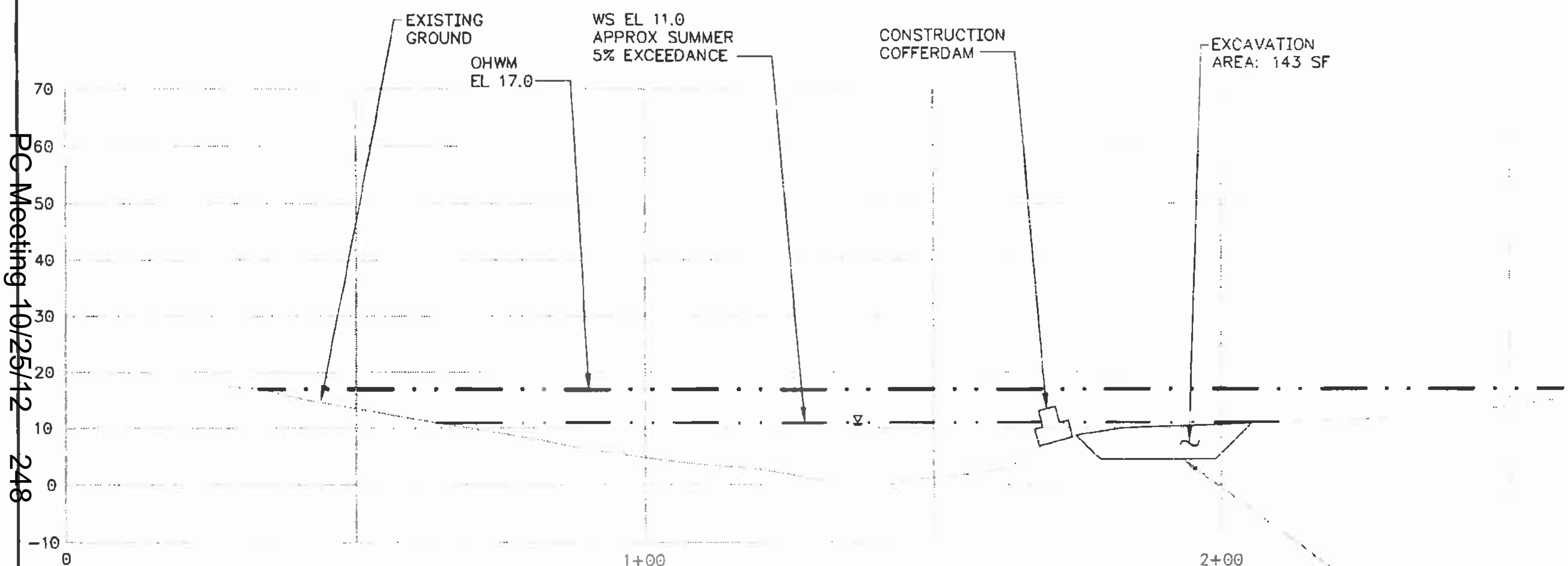
LOTWP
RIPS
GENERAL
SECTION C

SCALE: 1" = 30'			
REV DATE	BY	CHK	APP
DWG. NO. FIGURE 8			REV 0



SECTION D/3

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
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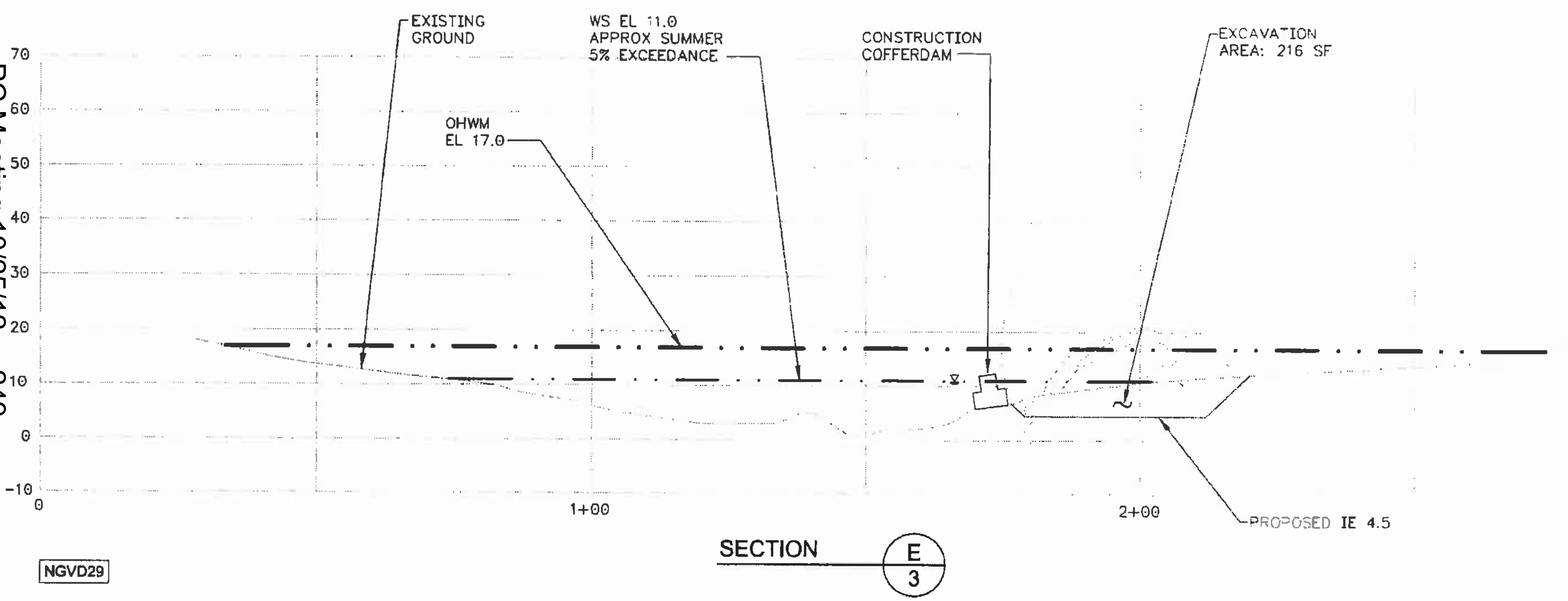
LOTWP
RIPS
GENERAL
SECTION D

SCALE: 1" = 30'

REV DATE	BY	CHK	APP

DWG NO: FIGURE 9
REV: 0



PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
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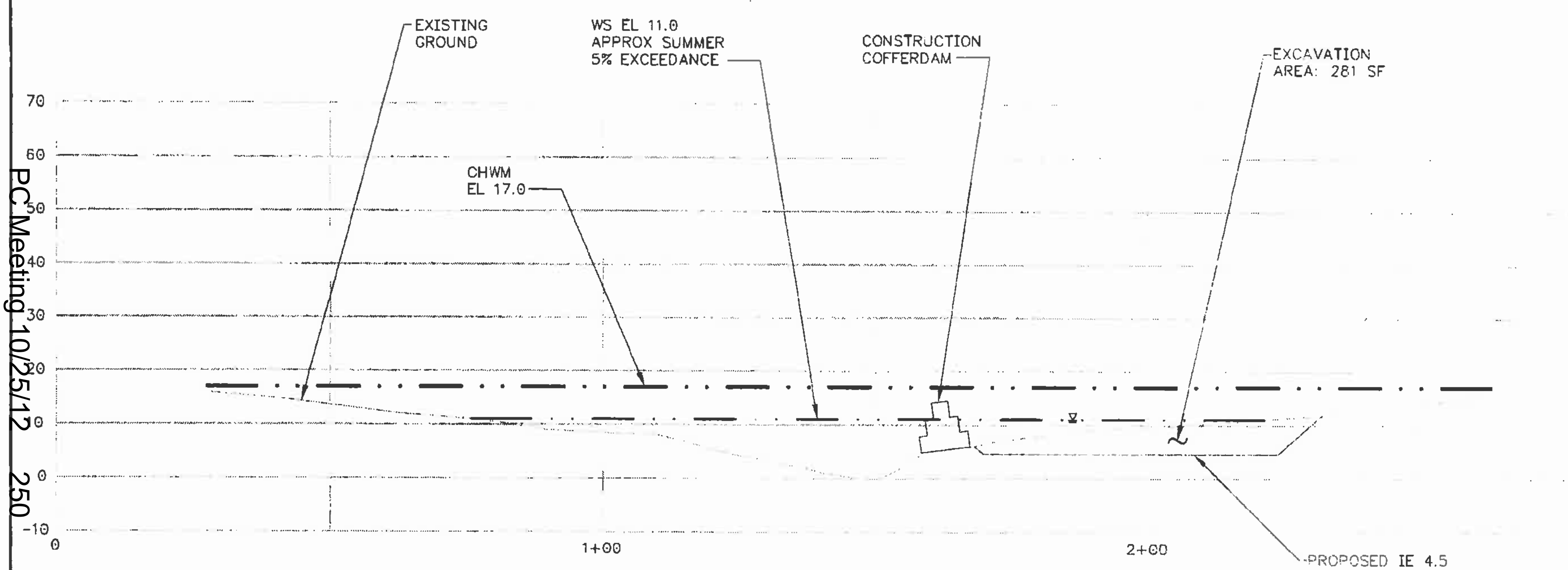
LOTWP
RIPS
GENERAL
SECTION E

SCALE: 1" = 30'

REV DATE	BY	CHK	APP

FIGURE 10

REV 0



SECTION F/3

NGVD29

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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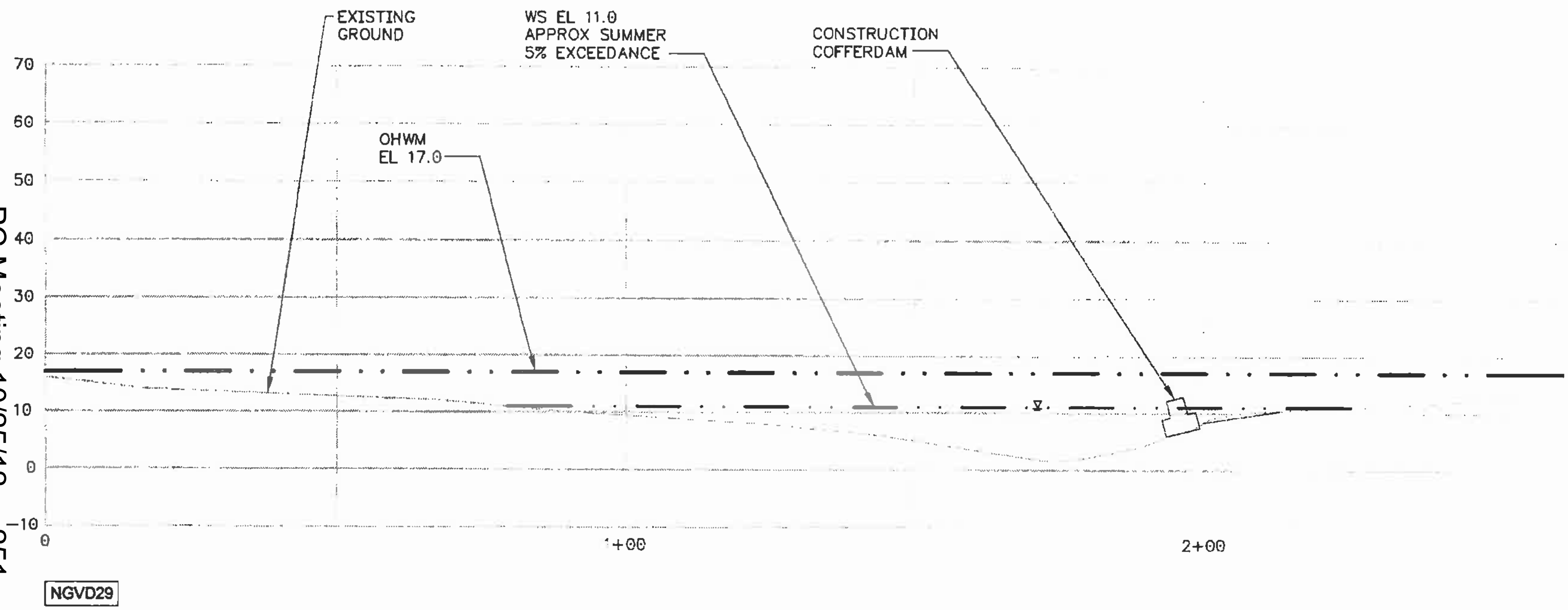
LOTWP
RIPS
GENERAL
SECTION F

SCALE: 1" = 30'

REV	DATE	BY	CHK	APP

FIGURE 11

REV 0



SECTION G/3

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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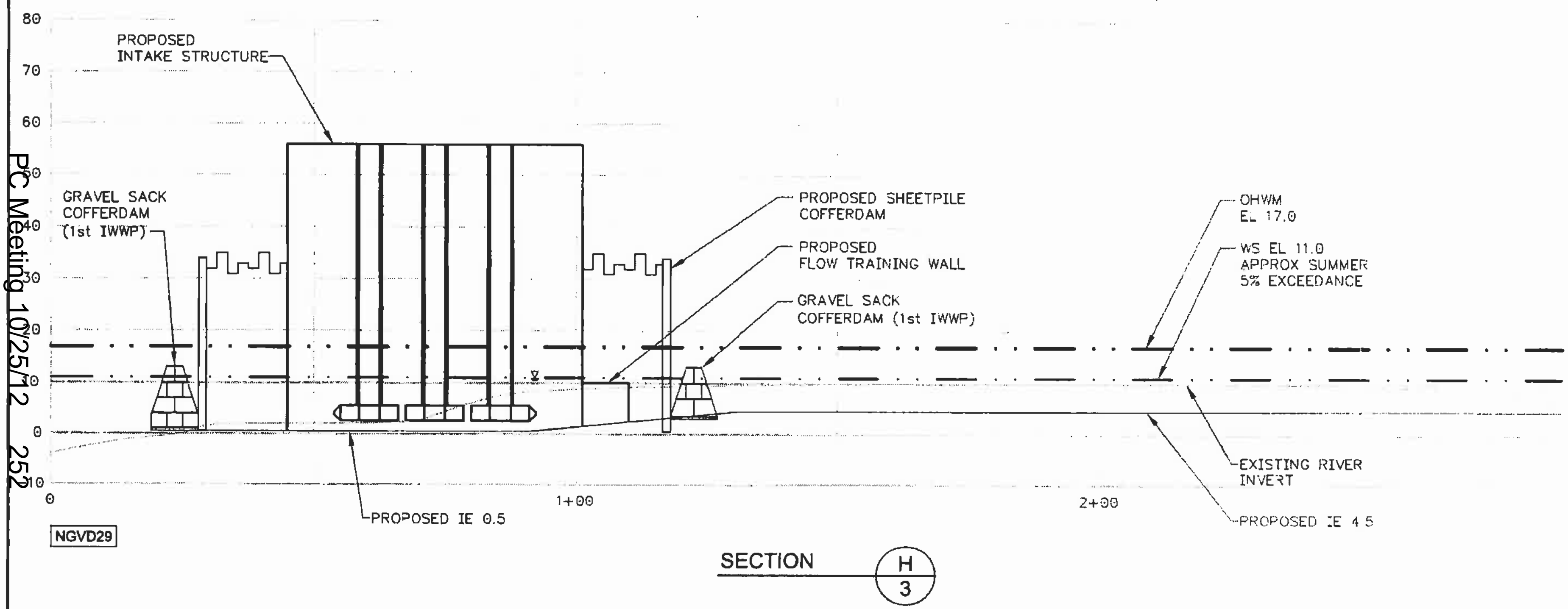
PRELIMINARY - NOT FOR CONSTRUCTION

LOTWP
RIPS
GENERAL
SECTION G

SCALE: 1" = 30'

REV DATE	BY	CHK	APP

DWG. NO. FIGURE 12 REV 0



PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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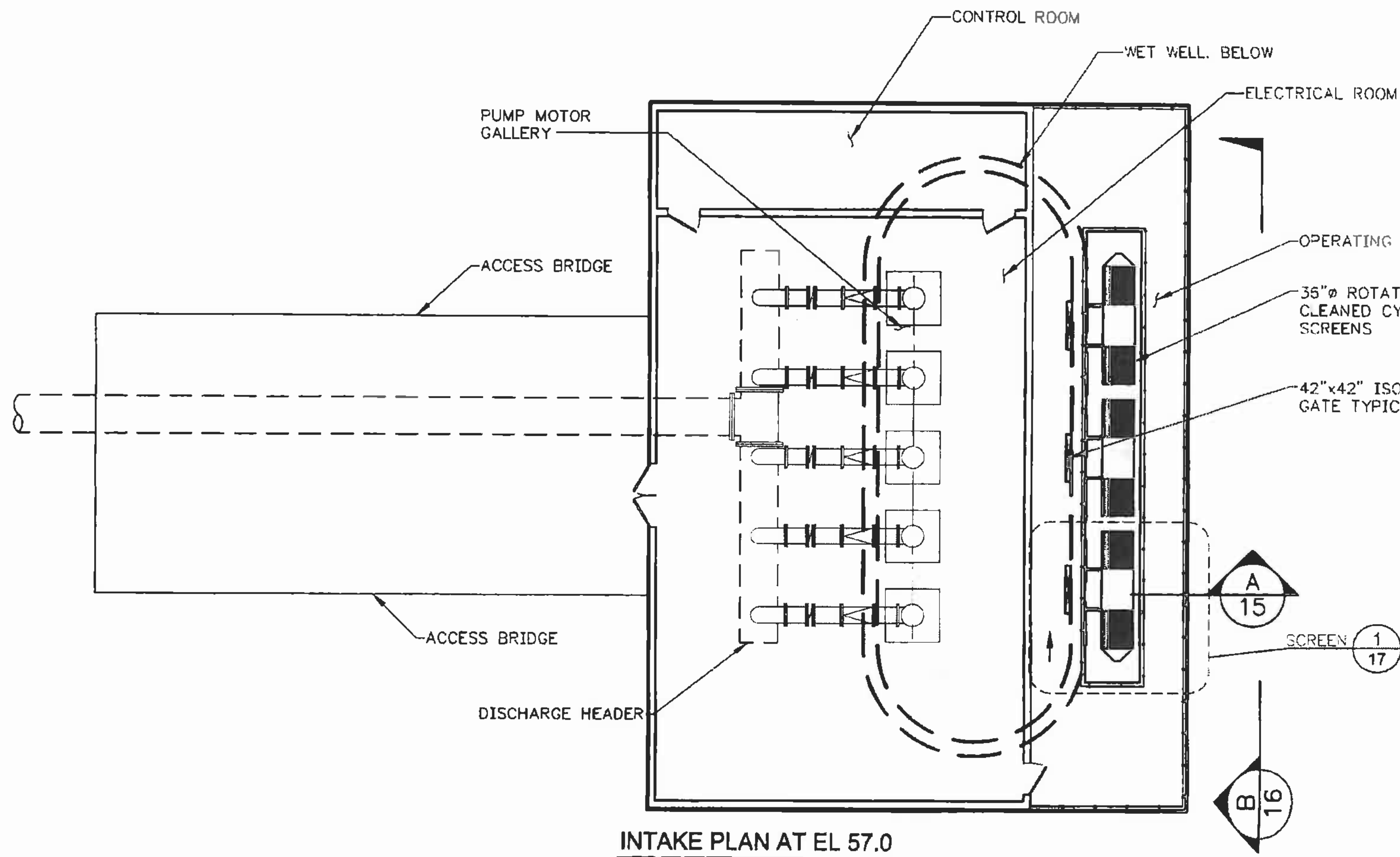
LOTWP
RIPS
GENERAL
SECTION H

SCALE: 1" = 30'			
REV DATE	BY	CHK	APP

DWG. NO.	REV
FIGURE 13	0



INTAKE PLAN AT EL 57.0

PRELIMINARY - NOT FOR CONSTRUCTION

LOTWP
RIPS
GENERAL
NEW INTAKE STRUCTURE PLAN AT EL 57.0

FIGURE 14 REV 0

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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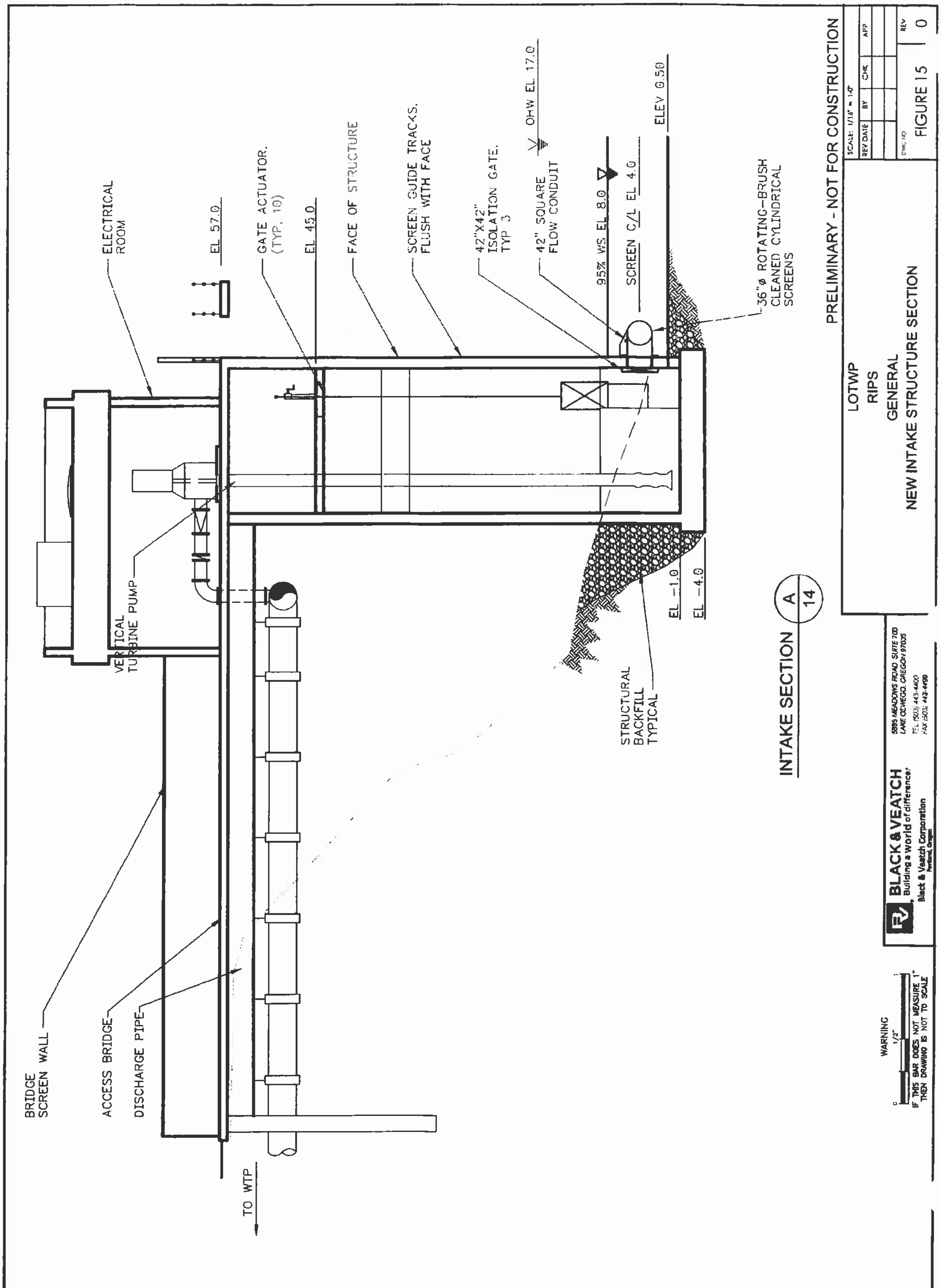

ELECTRICAL ROOM
EL 57.0
GATE ACTUATOR. (TYP. 10)
EL 45.0
FACE OF STRUCTURE
SCREEN GUIDE TRACKS. FLUSH WITH FACE
42"X42" ISOLATION GATE. TYP 3
42" SQUARE FLOW CONDUIT
OHW EL 17.0
95% WS EL 8.0
SCREEN C/L EL 4.0
ELEV 0.50
36"ø ROTATING-BRUSH CLEANED CYLINDRICAL SCREENS
VERTICAL TURBINE PUMP
EL -1.0
EL -4.0
STRUCTURAL BACKFILL TYPICAL
INTAKE SECTION
A
14
BRIDGE SCREEN WALL
ACCESS BRIDGE
DISCHARGE PIPE
TO WTP
PRELIMINARY - NOT FOR CONSTRUCTION
LOTWP
RIPS
GENERAL
NEW INTAKE STRUCTURE SECTION
FIGURE 15
REV
0
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WARNING
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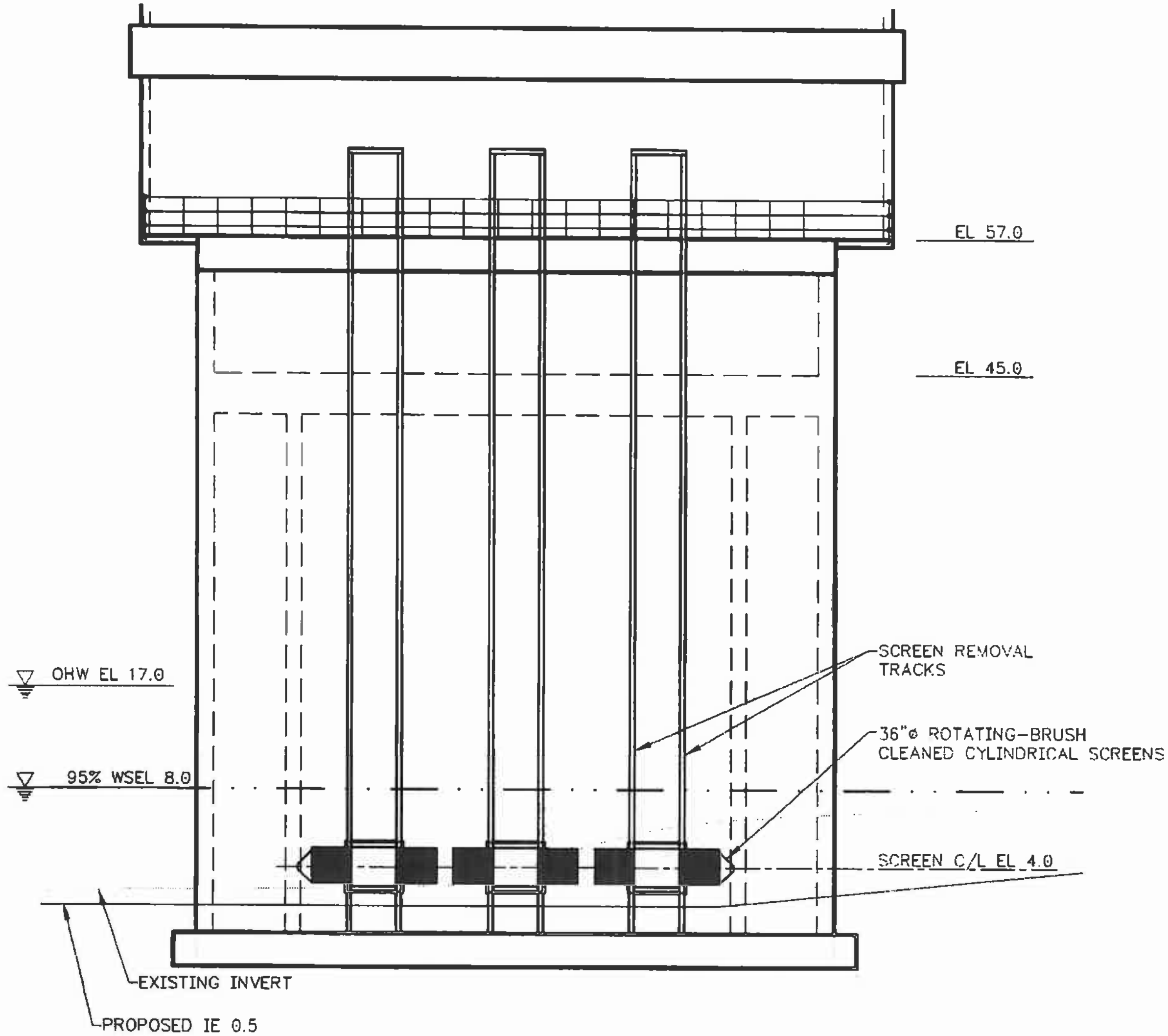

INTAKE ELEVATION VIEW B/14

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
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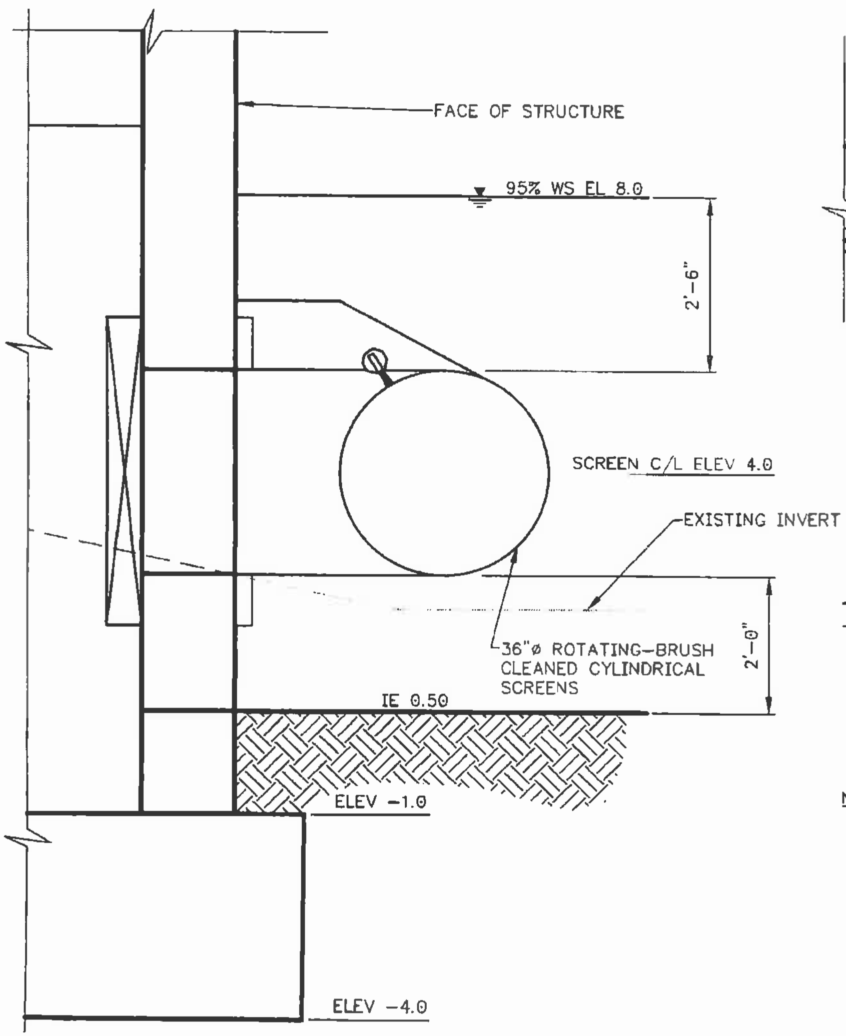
LOTWP
RIPS
GENERAL
NEW INTAKE STRUCTURE ELEVATION

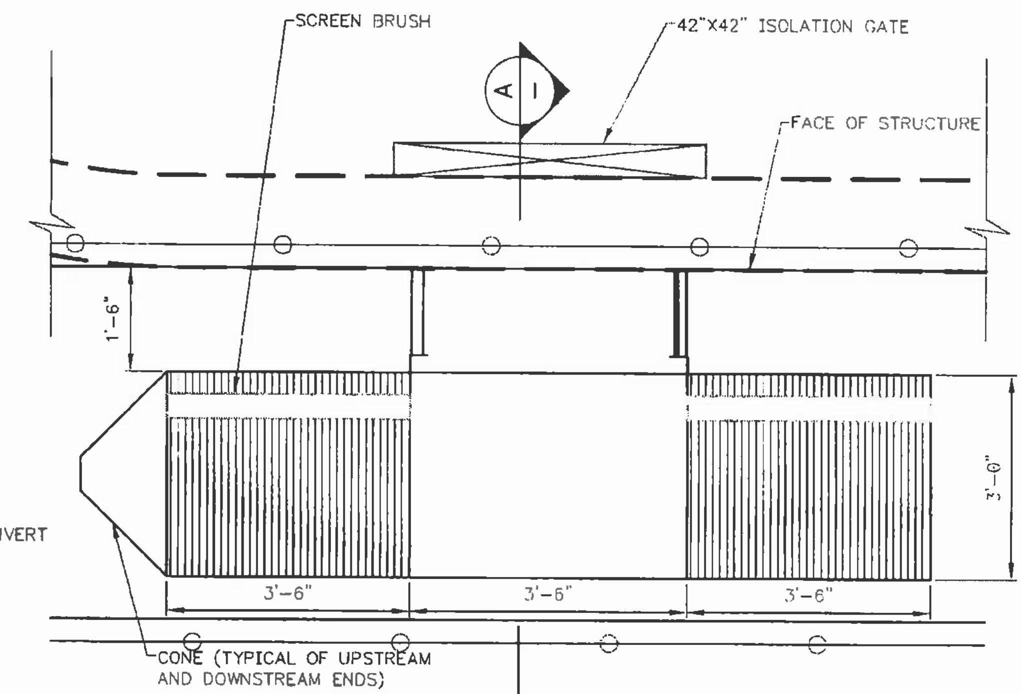
SCALE 1/16" = 1'-0"

REV DATE	BY	CHK	APP

FIGURE 16 REV 0



SECTION A/-



DETAIL 1/14

NOTES:

1. SCREEN DIAMETER. 36"
2. EFFECTIVE SCREEN LENGTH: 7'-0" PER SCREEN (2x3.5')
3. SCREEN AREA: 66.0 SF PER SCREEN
4. TOTAL SCREEN AREA: 197.9 SF
5. MAXIMUM DIVERSION RATE: 38 MGD (58.8 CFS)
6. MAXIMUM APPROACH VELOCITY: 0.30 FPS
7. MINIMUM SWEEPING VELOCITY MODIFICATIONS @ 95% EXCEEDANCE FLOW: 0.5 FPS
8. TYPICAL SWEEPING VELOCITY @ 1050 CFS RIVER FLOW WITH CHANNEL MODIFICATIONS: 1.3 FPS
9. MINIMUM SCREEN SUBMERGENCE 95% EXCEEDANCE FLOW: 30"
10. WALL CLEARANCE: 18"
11. BOTTOM CLEARANCE: 24"
12. SCREEN VOLUME: 11 CY TOTAL

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
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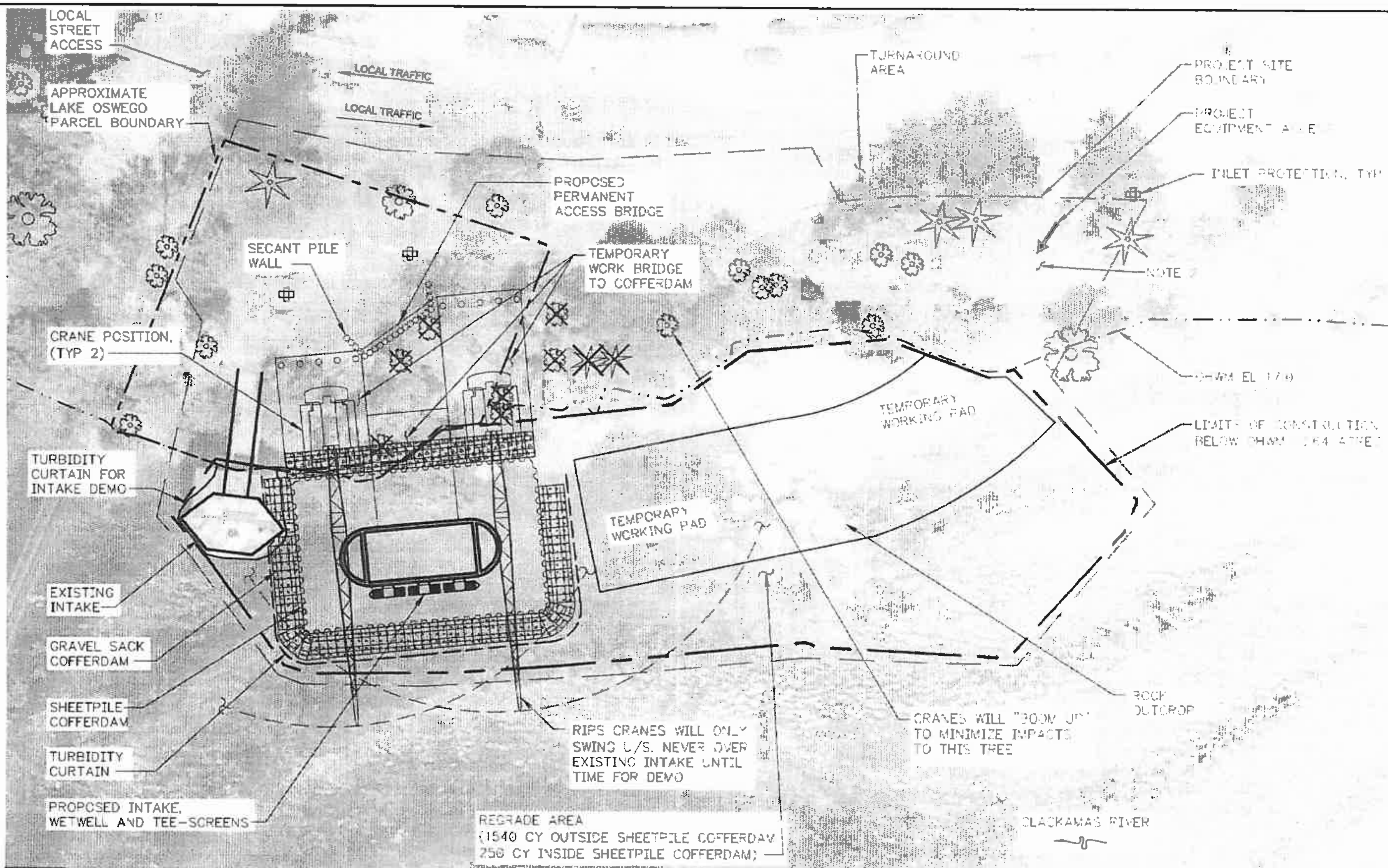
LOTWP
RIPS
GENERAL
ROTATING SCREENS DETAILS

SCALE: 1" = 30'			
REV DATE	BY	CHK	APP
DWG NO			REV
FIGURE 17			0



NOTE:
1. X – TREE TO BE REMOVED.
2. ACCESS ROUTE VEGETATION TO BE RESTORED TO PRE-CONSTRUCTION CONDITION.

NORTH

OVERALL SITE PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
1/2"
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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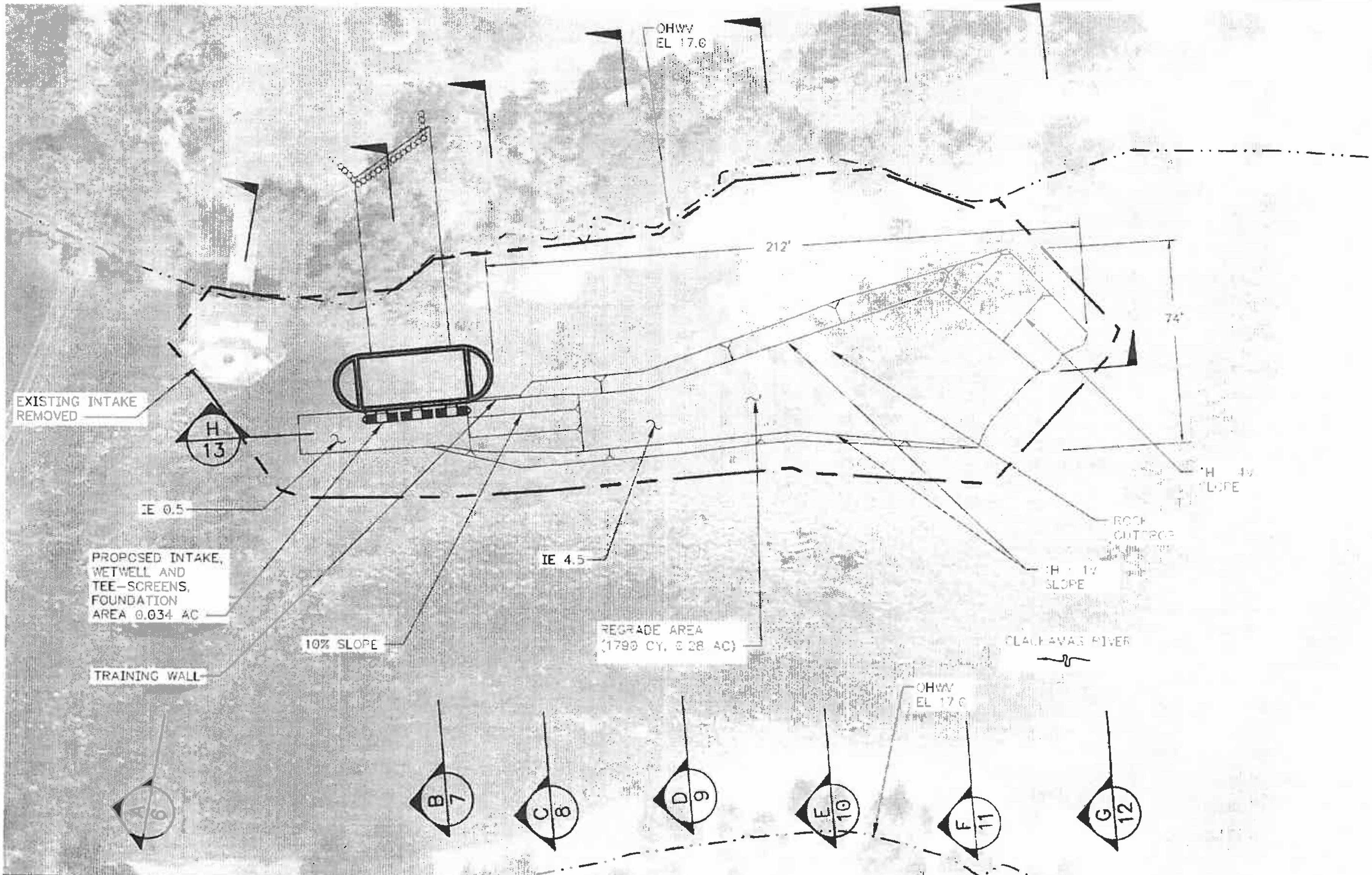
LOTWP
RIPS
CONSTRUCTION ACCESS AND
STAGING PLAN

FIGURE 18 | 0



NGVD29

NOTE: IE = INVERT ELEVATION

NORTH

OVERALL SITE PLAN

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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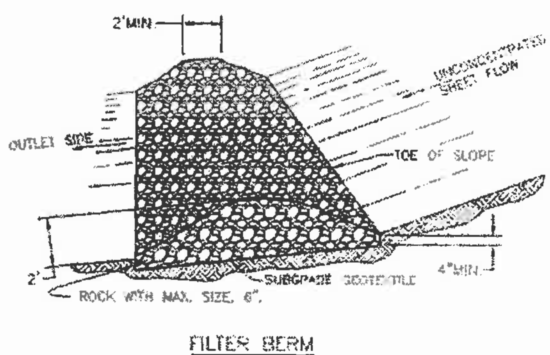
LOTWP
RIPS
GENERAL
SITE PLAN - PERMANENT IMPACTS

FIGURE 19 0

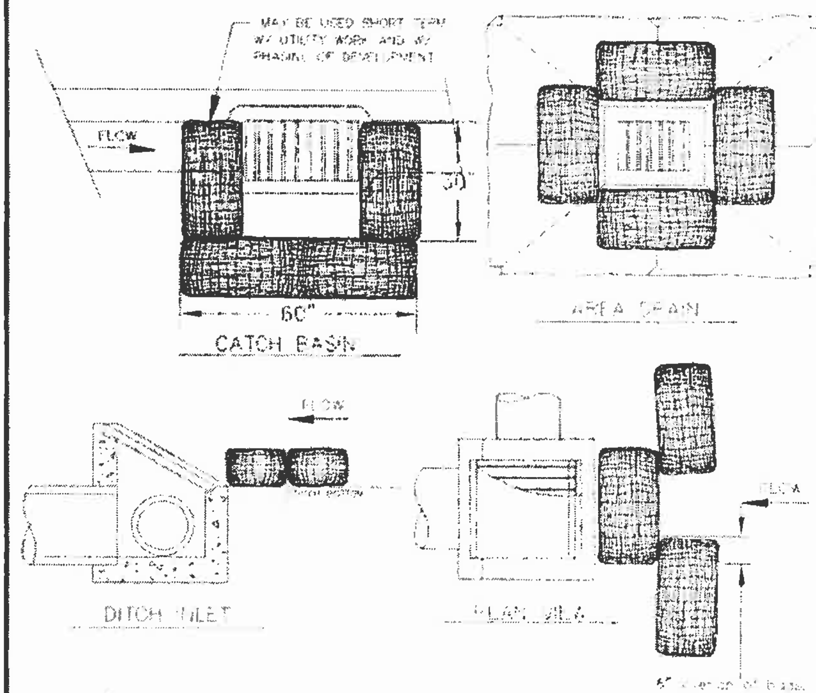


NOTES:
1. DIRECT THE OUTLET SIDE OF THE ROCK FILTER BERM/DAMS ONTO A STABILIZED AREA, SUCH AS VEGETATION AND OR ROCK.
2. EMBED A MIN. OF 4" INTO THE EXISTING GROUND/EMBANKMENT.
3. USE 3:1 OR FLATTER SIDE SLOPES WITHIN THE SAFETY CLEAR ZONE. USE 6:1 OR FLATTER SIDE SLOPES.

ROCK FILTER BERM

Detail Drawing 4-14

REV. 2/19/09



NOTES:
1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES
2. BIO-FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2" WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO-BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6"

INLET PROTECTION TYPE 4

DETAIL DRAWING 4-18

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING
0 1/2" 1"
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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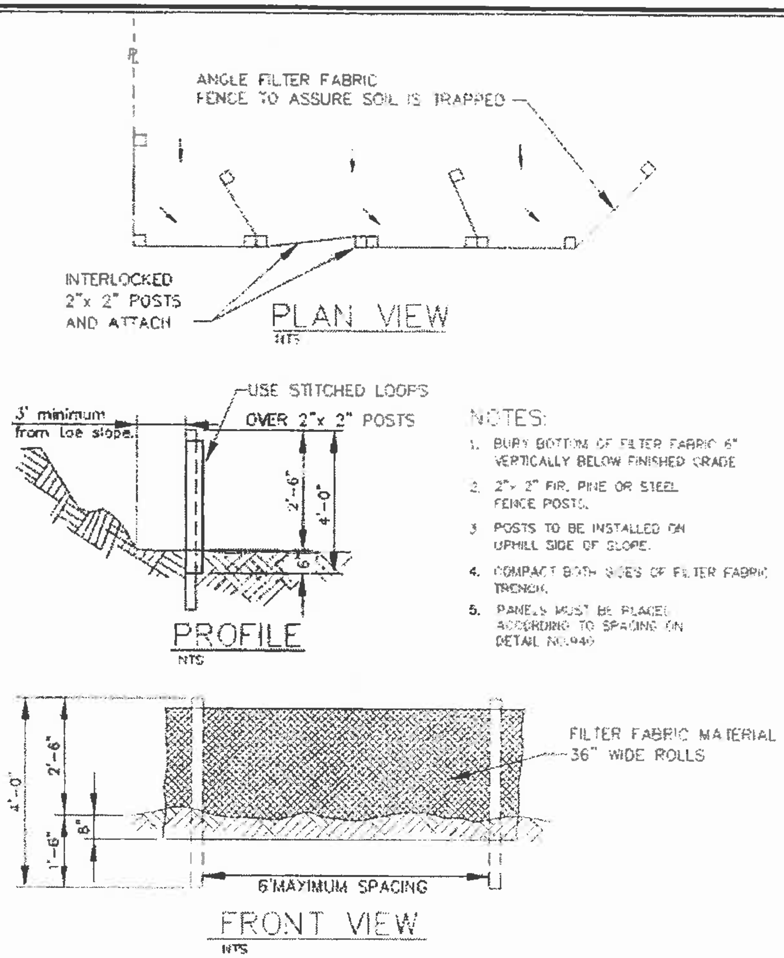
LOTWP
RIPS
GENERAL
EROSION PROTECTION - DETAILS

SCALE: NO SCALE			
REV DATE	BY	CHK	APP
DWG NO.			REV
FIGURE 20			0

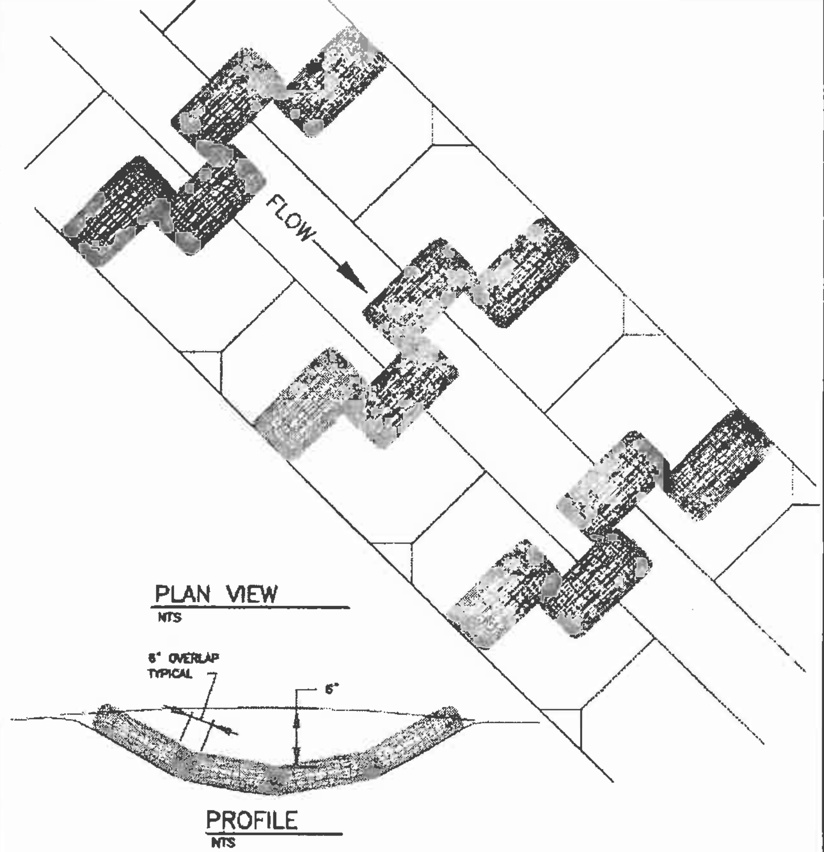


NOTES:

1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE
2. 2"x 2" FIR, PINE OR STEEL FENCE POSTS.
3. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
4. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
5. PANELS MUST BE PLACED ACCORDING TO SPACING ON DETAIL NO.940

SEDIMENT FENCE

DETAIL DRAWING 4-23 REVISED 01-09



NOTES:

1. STAKING OF BAGS REQUIRED USING (2) 1"X2" WOOD STAKES OR APPROVED EQUAL PER BAG.
2. SURFACE MUST BE SMOOTH BEFORE APPLICATION.
3. CHECK DAMS CAN BE CONSTRUCTED USING STRAW WATTLES OR OTHER MATERIALS AS APPROVED BY THE DISTRICT OR CITY.

CHECK DAM - BIO-FILTER BAGS

DETAIL DRAWING 4-5 REVISED 01-09

PRELIMINARY - NOT FOR CONSTRUCTION

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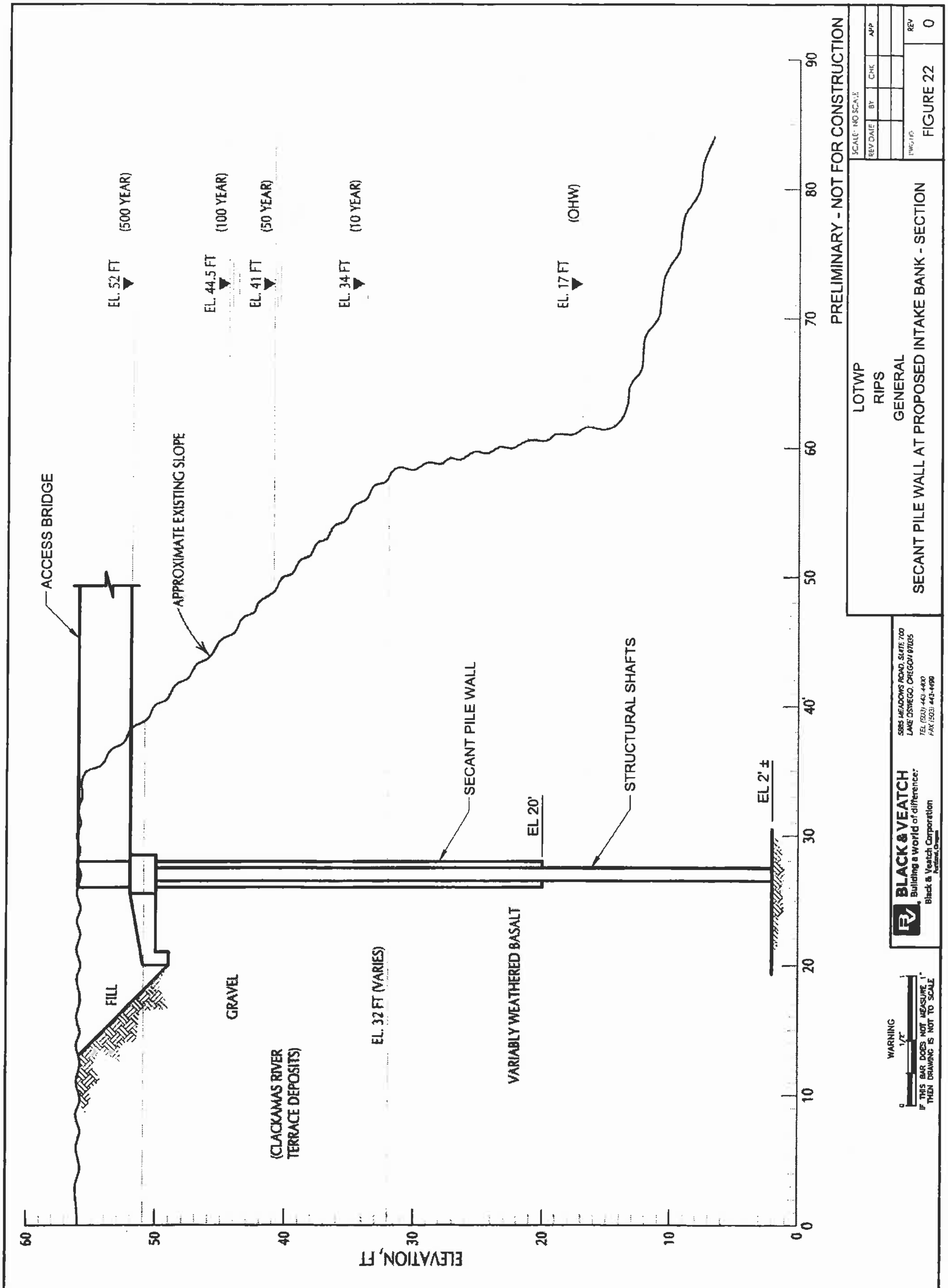
LOTWP
RIPS
GENERAL
EROSION PROTECTION - DETAILS

SCALE: NO SCALE

REV DATE	BY	CHK	APP

DWG NO: FIGURE 21 REV: 0



PRELIMINARY - NOT FOR CONSTRUCTION
ACCESS BRIDGE
APPROXIMATE EXISTING SLOPE
EL. 52 FT (500 YEAR)
EL. 44.5 FT (100 YEAR)
EL. 41 FT (50 YEAR)
EL. 34 FT (10 YEAR)
EL. 17 FT (OHW)
SECANT PILE WALL
STRUCTURAL SHAFTS
EL 20'
EL 2' ±
FILL
GRAVEL
(CLACKAMAS RIVER TERRACE DEPOSITS)
EL. 32 FT (VARIES)
VARIABLY WEATHERED BASALT
ELEVATION, FT
0
10
20
30
40
50
60
70
80
90
WARNING
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE
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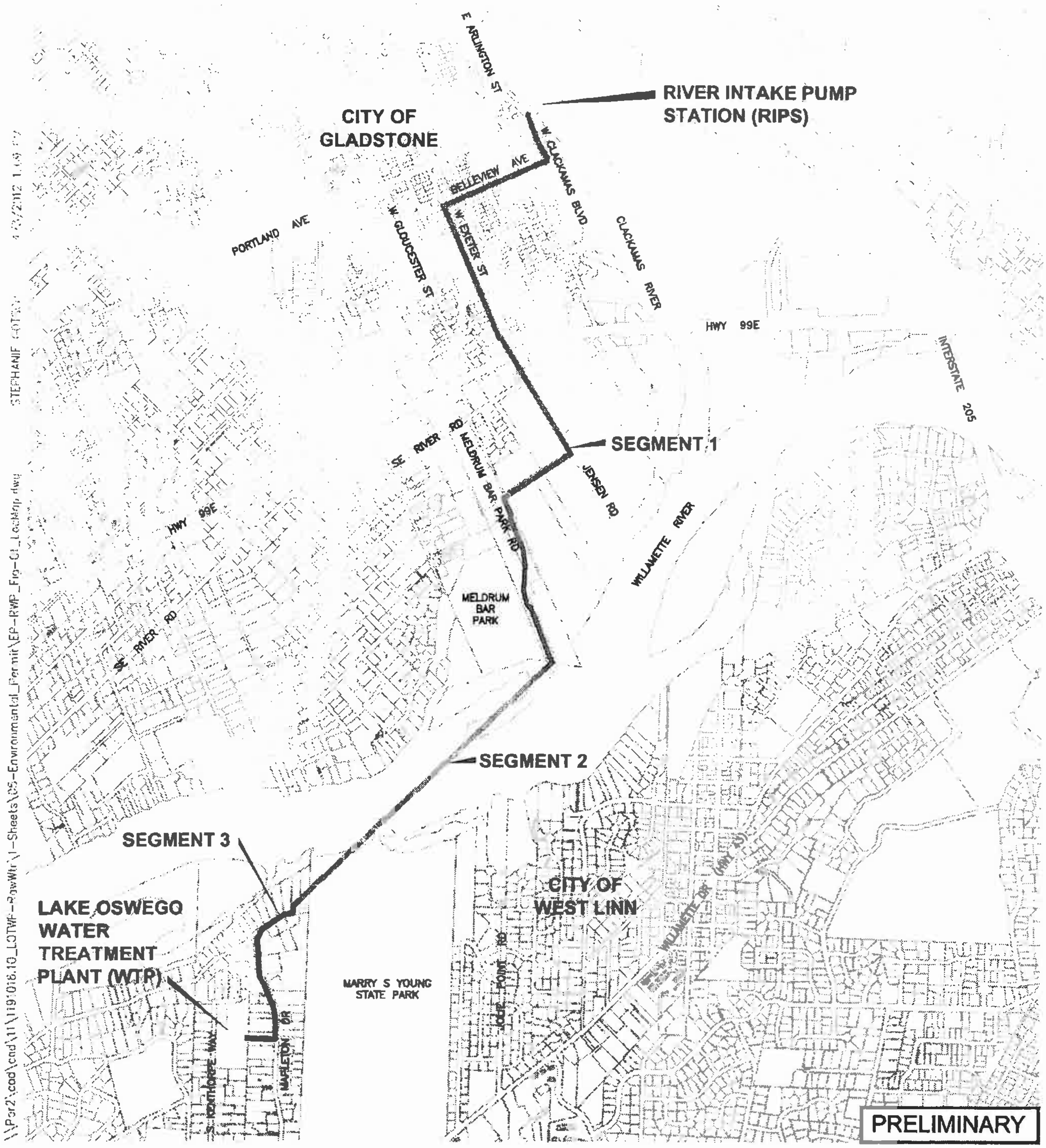
LOTWP
RIPS
GENERAL
SECANT PILE WALL AT PROPOSED INTAKE BANK - SECTION
SCALE: NO SCALE
REV DATE
BY
CHK
APP
FIGURE 22
REV
0

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

Appendix D: Project Figures



LEGEND

SEGMENT 1: RWP - RIVER INTAKE PUMP STATION (RIPS) TO MELDRUM BAR PARK

SEGMENT 2: RWP - MELDRUM BAR PARK TO OPRD PROPERTY (SEE FIGURES 3,4,5,6,7,21,22,23)

SEGMENT 3: RWP - OPRD PROPERTY TO LAKE OSWEGO WATER TREATMENT PLANT (WTP)

0 750 1500

APPROXIMATE SCALE IN FEET

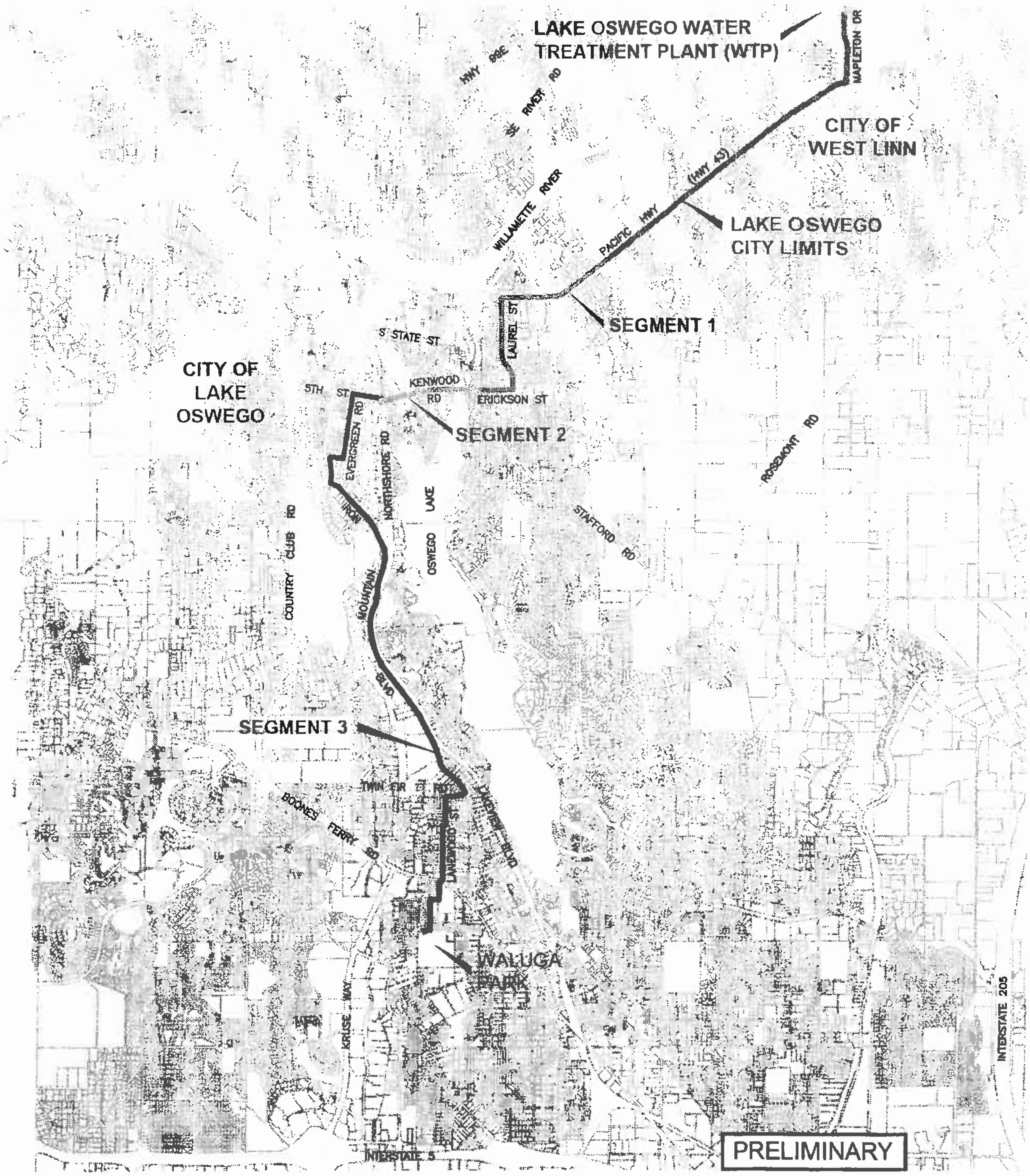
Kennedy/Jenks Consultants

LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL PERMIT - LAKE OSWEGO, OREGON

LOCATION MAP

K/J 1191016.10

FIGURE 1



LEGEND

SEGMENT 1: FWP - LAKE OSWEGO WATER TREATMENT PLANT (WTP) TO ERICKSON STREET

SEGMENT 2: FWP - ERICKSON STREET TO CABANA LANE

SEGMENT 3: FWP - CABANA LANE TO WALUGA RESERVOIR

N

0 1750 3500

APPROXIMATE SCALE IN FEET

Kennedy/Jenks Consultants

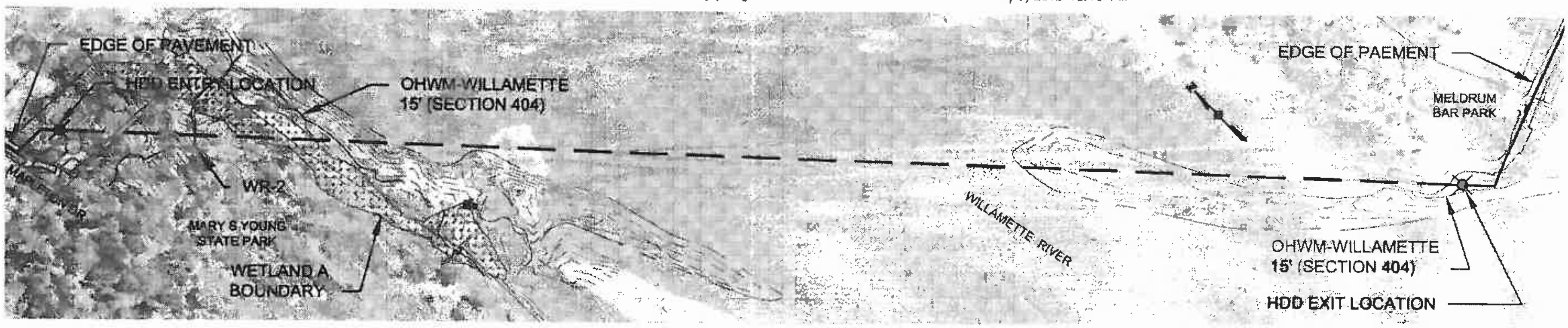
LAKE OSWEGO-TIGARD WATER PARTNERSHIP
FINISHED WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

LOCATION MAP

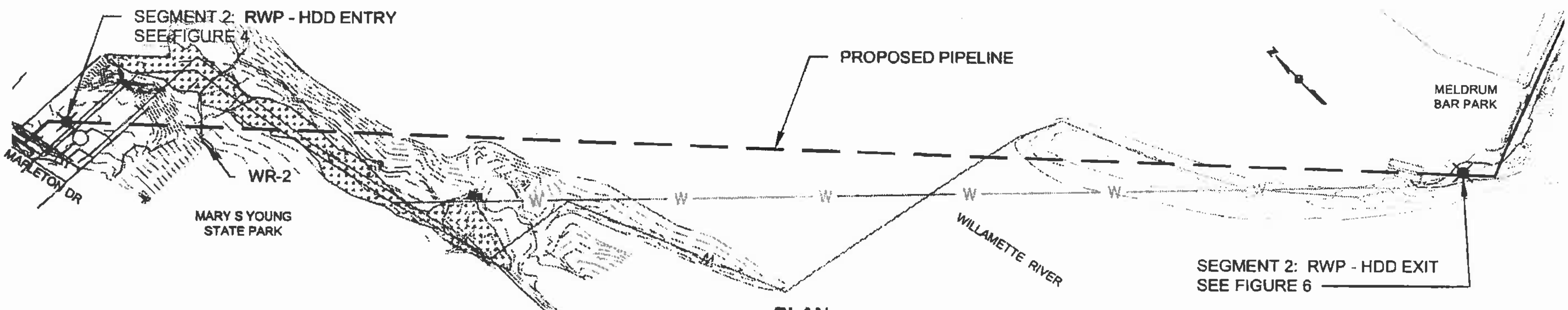
K/J 1191016.20

FIGURE **2**

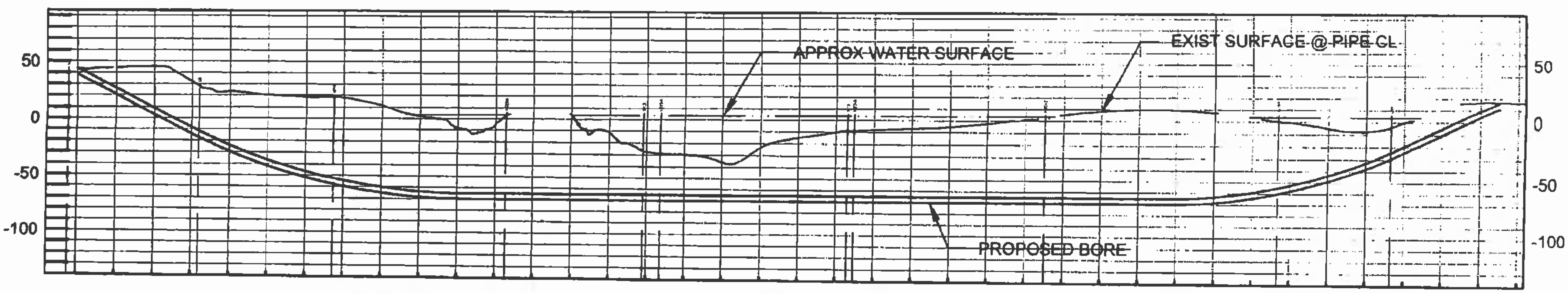
P:\cad\11\1191016.10_LOTWP-RawWtr\1-Sheets\03-Figures-RWR-Willamette_Boring(2)\Willamette_HDD_PnP(3).dwg STEPHANIE GOTSCH 4/3/2012 12:16 PM



PLAN



PLAN



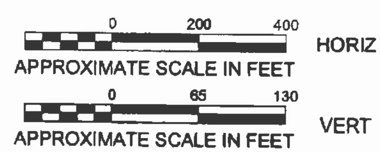
PROFILE

PRELIMINARY

Kennedy/Jenks Consultants

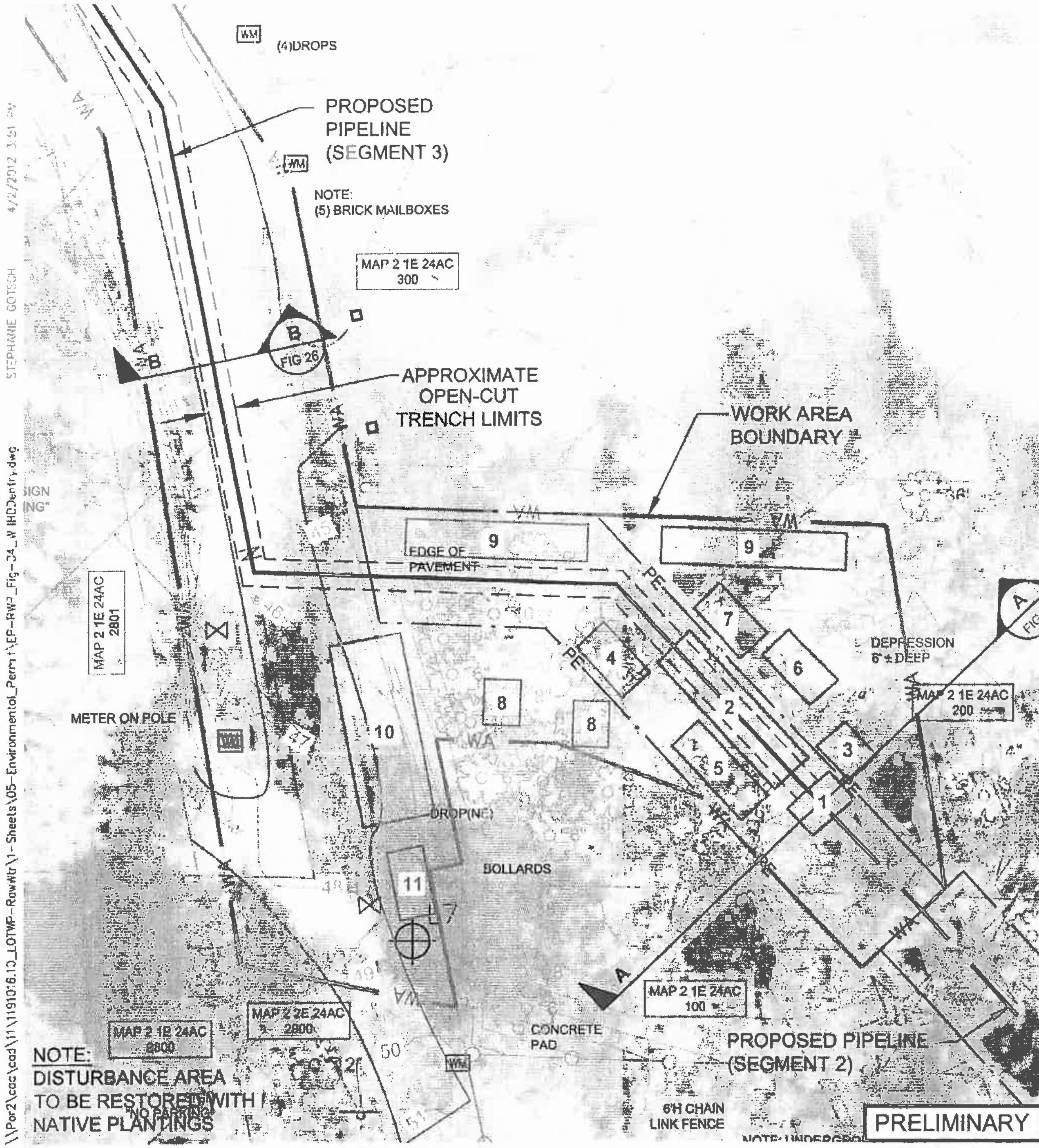
LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

K/J 1191016.10



SEGMENT 2:
RWP - WILLAMETTE RIVER HDD
PLAN AND PROFILE

FIGURE 3



1 MUD PIT 8x12x5
(ENTRY, 480 CUBIC FT OF EXCAVATION)
2 DRILL RIG 10x45
3 CONTROL CAB 8x10
4 CRANE / EXCAVATOR 10x15
5 DRILL RODS 8x30
6 RIG POWER UNIT 8x15
7 GENERATOR 8x15
8 MUD PUMPS 8x10
9 FRAC TANK 8x40
10 SOLIDS CONTROL 16x40
11 TOOL VAN 8x15

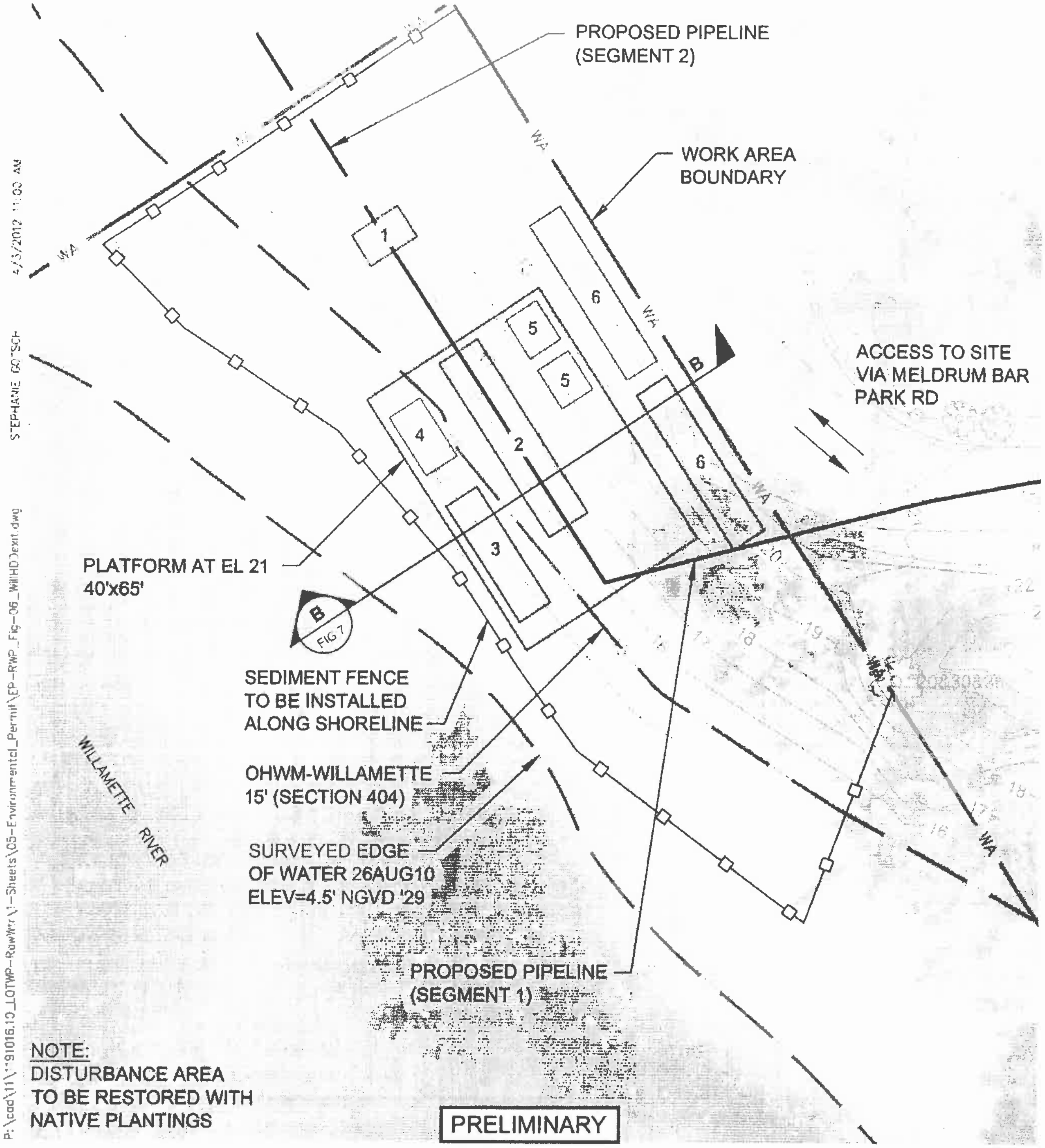
Kennedy/Jenks Consultants

LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

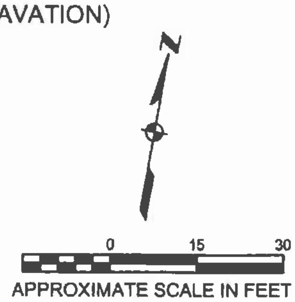
SEGMENT 2:
RWP - WILLAMETTE RIVER HDD
ENTRY PLAN

K/J 1191016.10

FIGURE 4



1 MUD PIT 8x12x5
(ENTRY, 480 CUBIC FT OF EXCAVATION)
2 DRILL RIG 10x45
3 DRILL RODS 8x30
4 GENERATOR 8x15
5 MUD PUMPS 8x10
6 BAKER TANK 8x40



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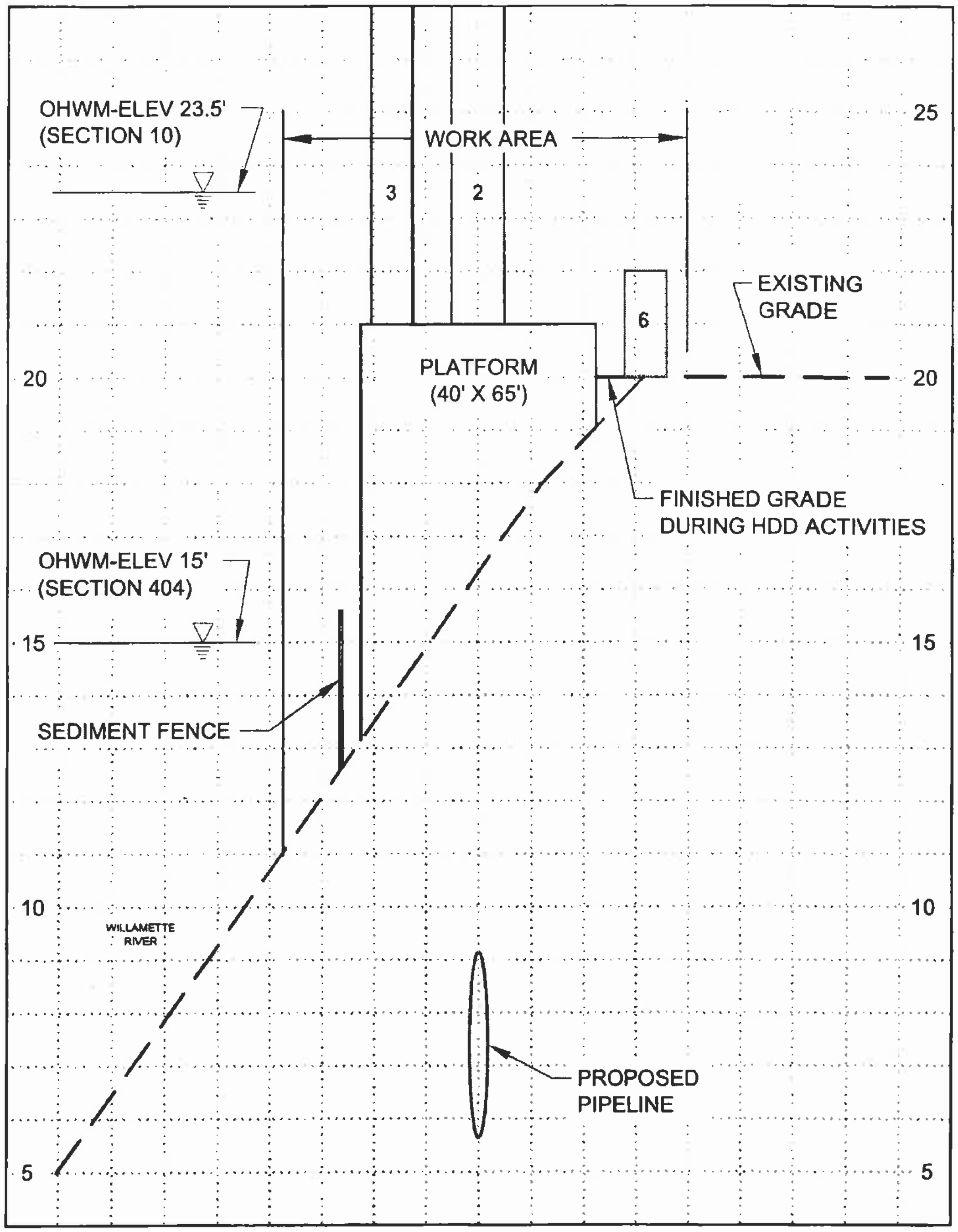
LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

SEGMENT 2:
RWP - WILLAMETTE RIVER HDD
EXIT PLAN

K/J 1191016.10

FIGURE 5



P: \cad\11\1191016.10_LOTWP-RawWtr\1-Sheets\05-Environmental_Permit\EP-RWP_Fig-07_ExitSection.dwg STEPHANIE GOTSCH 4/3/2012 11:39 AM

SECTION B-B

PRELIMINARY

HORIZ: 1"=30'
VERT: 1"=3'

2 DRILL RIG 10x45
3 DRILL RODS 8x30
6 BAKER TANK 8x40

Kennedy/Jenks Consultants

LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

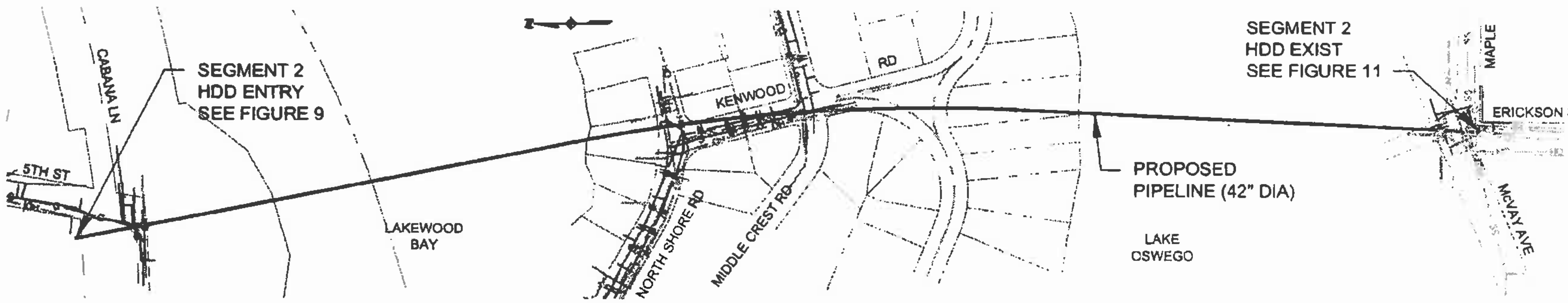
SEGMENT 2:
RWP - WILLAMETTE RIVER HDD
EXIT CROSS-SECTION

K/J 1191016.10

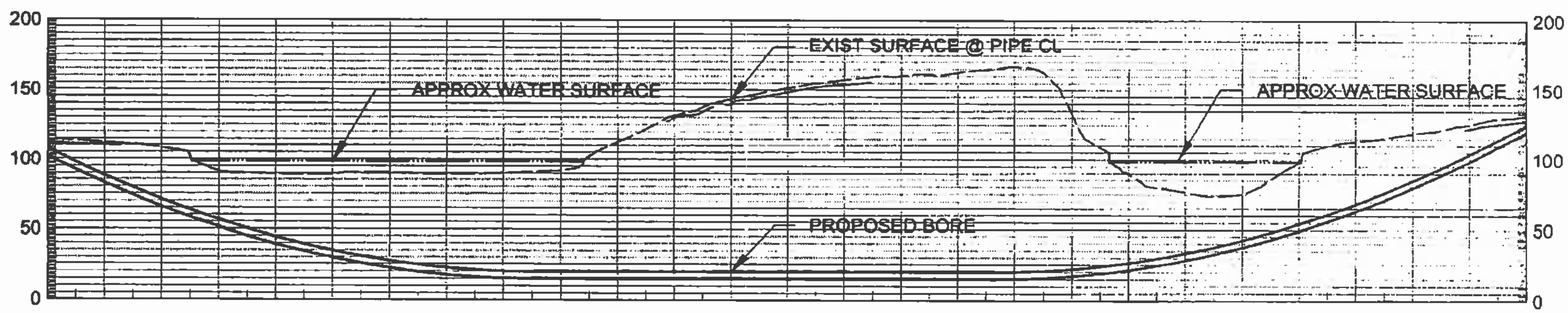
FIGURE 6

P: \cad\11\1191016.10_LOTWP-RawWtr\1-Sheets\01-Figures-FWR-Seg4-Boring\X-Seg4-FWP_PnP.dwg STEPHANIE GOTSCH 2/1/2012 3:52 PM

PLAN



PLAN



PROFILE

PRELIMINARY

Kennedy/Jenks Consultants

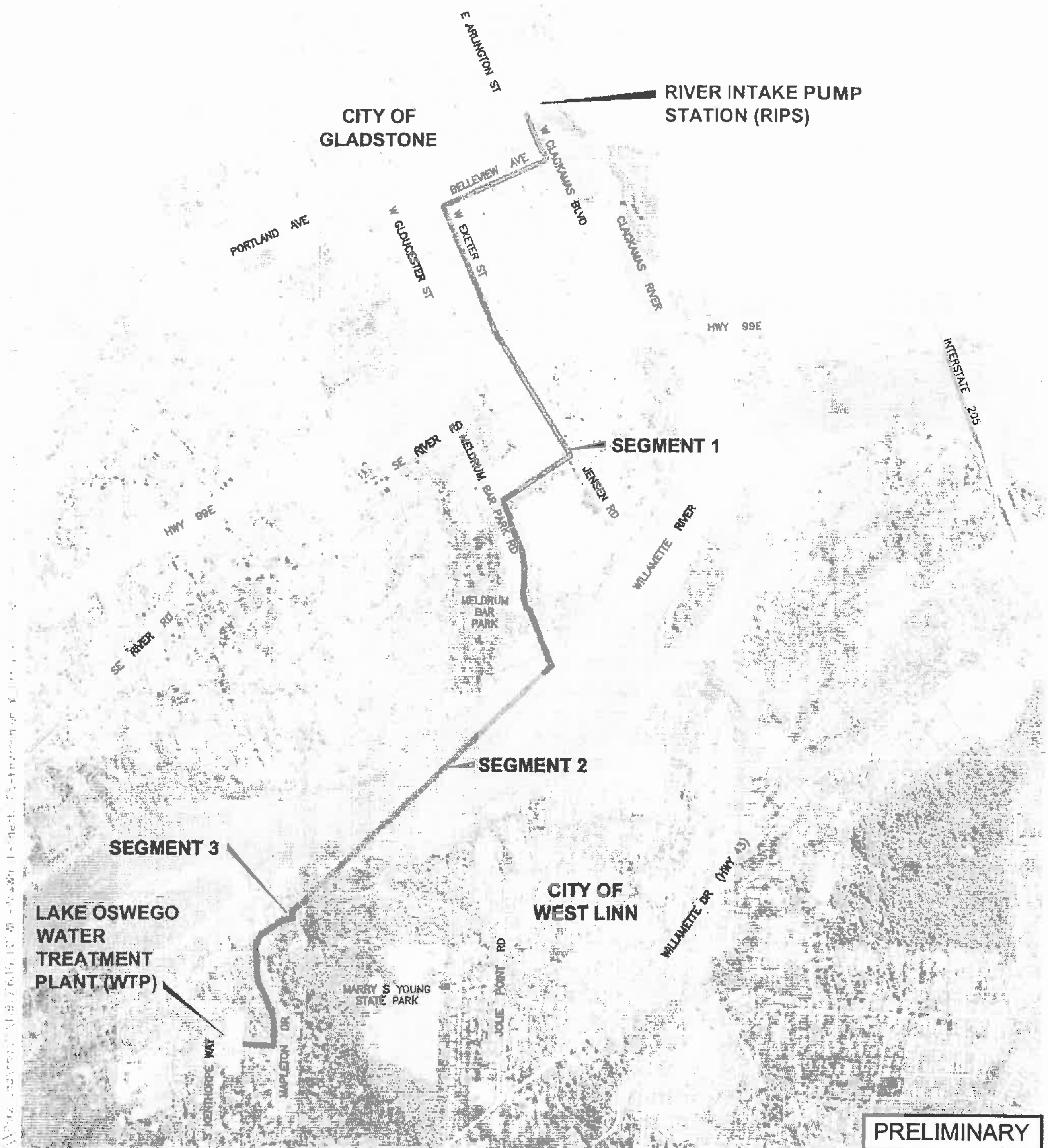
LAKE OSWEGO-TIGARD WATER PARTNERSHIP
FINISHED WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

K/J 1191016.20

0 150 300 HORIZ
APPROXIMATE SCALE IN FEET
0 60 120 VERT
APPROXIMATE SCALE IN FEET

SEGMENT 2:
FWP - LAKE OSWEGO HDD
PLAN AND PROFILE

FIGURE 7



SOURCE: AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO, SEPTEMBER 2011.

LEGEND

- SEGMENT 1: RWP - RIVER INTAKE PUMP STATION (RIPS) TO MELDRUM BAR PARK
- SEGMENT 2: RWP - MELDRUM BAR PARK TO OPRD PROPERTY (SEE FIGURES 3,4,5,6,7,21,22,23)
- SEGMENT 3: RWP - OPRD PROPERTY TO LAKE OSWEGO WATER TREATMENT PLANT (WTP)

N

0 750 1500

APPROXIMATE SCALE IN FEET

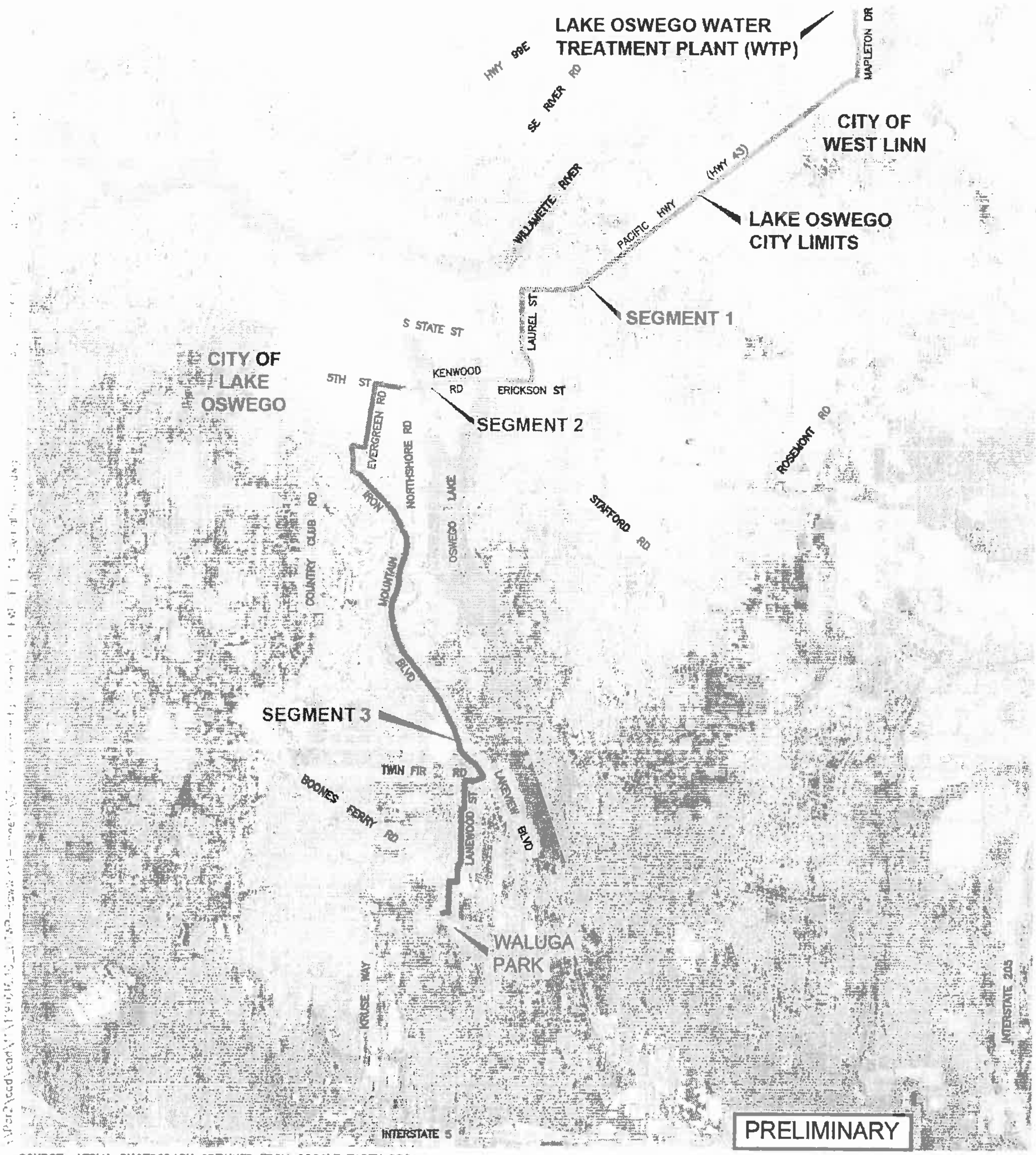
Kennedy/Jenks Consultants

LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

RECENT AERIAL PHOTO
OF RWP ALIGNMENT

K/J 1191016.10

FIGURE 8



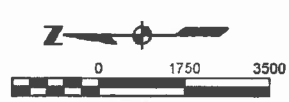
SOURCE: AERIAL PHOTOGRAPH OBTAINED FROM GOOGLE EARTH PRO, SEPTEMBER 2011.

LEGEND

SEGMENT 1: FWP - LAKE OSWEGO WATER TREATMENT PLANT (WTP) TO ERICKSON STREET

SEGMENT 2: FWP - ERICKSON STREET TO CABANA LANE

SEGMENT 3: FWP - CABANA LANE TO WALUGA RESERVOIR



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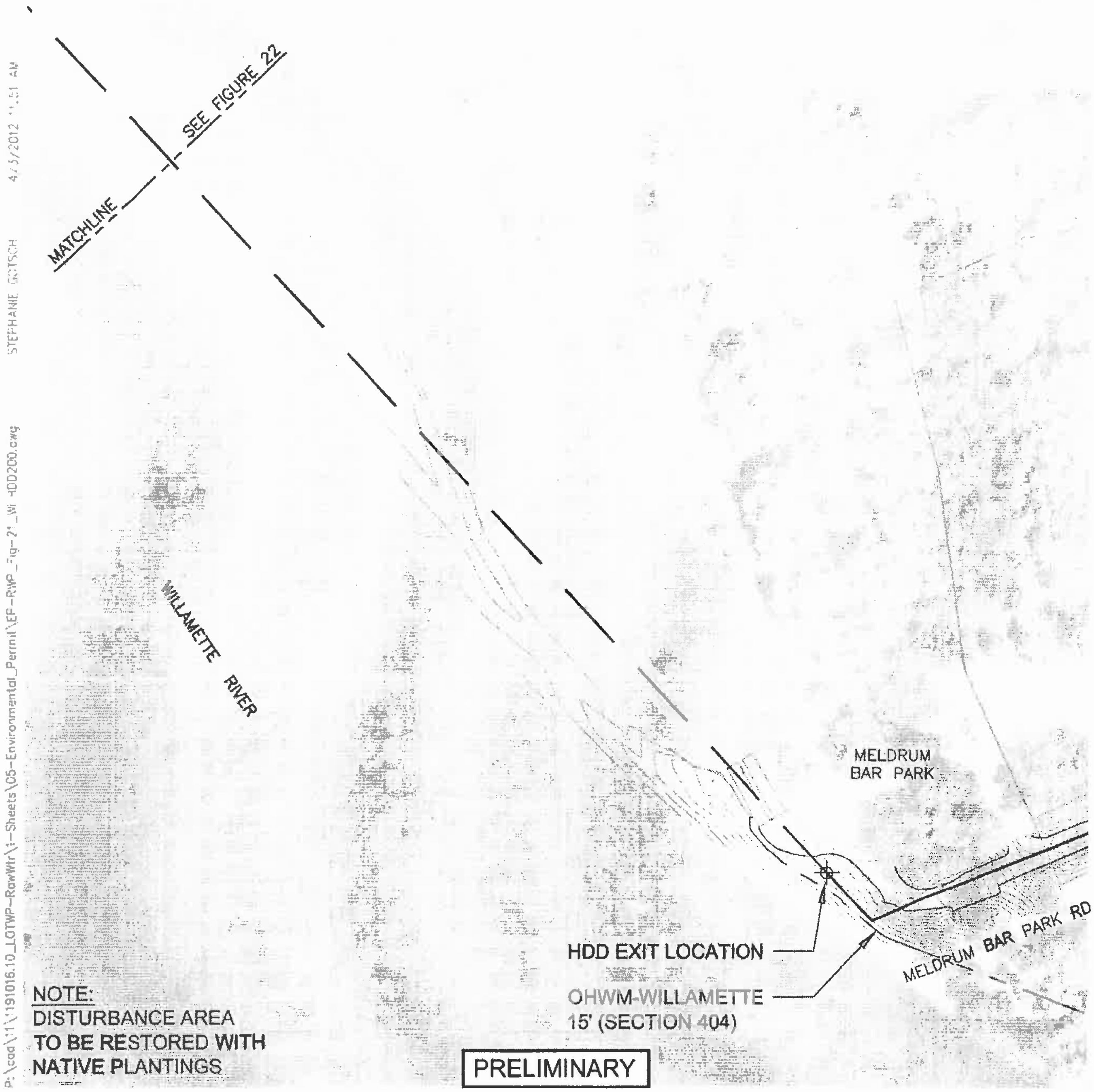
LAKE OSWEGO-TIGARD WATER PARTNERSHIP
FINISHED WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

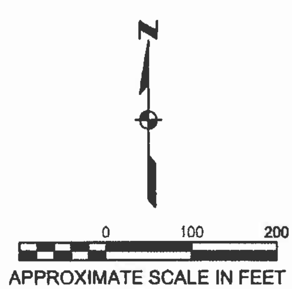
RECENT AERIAL PHOTO
OF FWP ALIGNMENT

K/J 1191016.20

FIGURE 9



Kennedy/Jenks Consultants

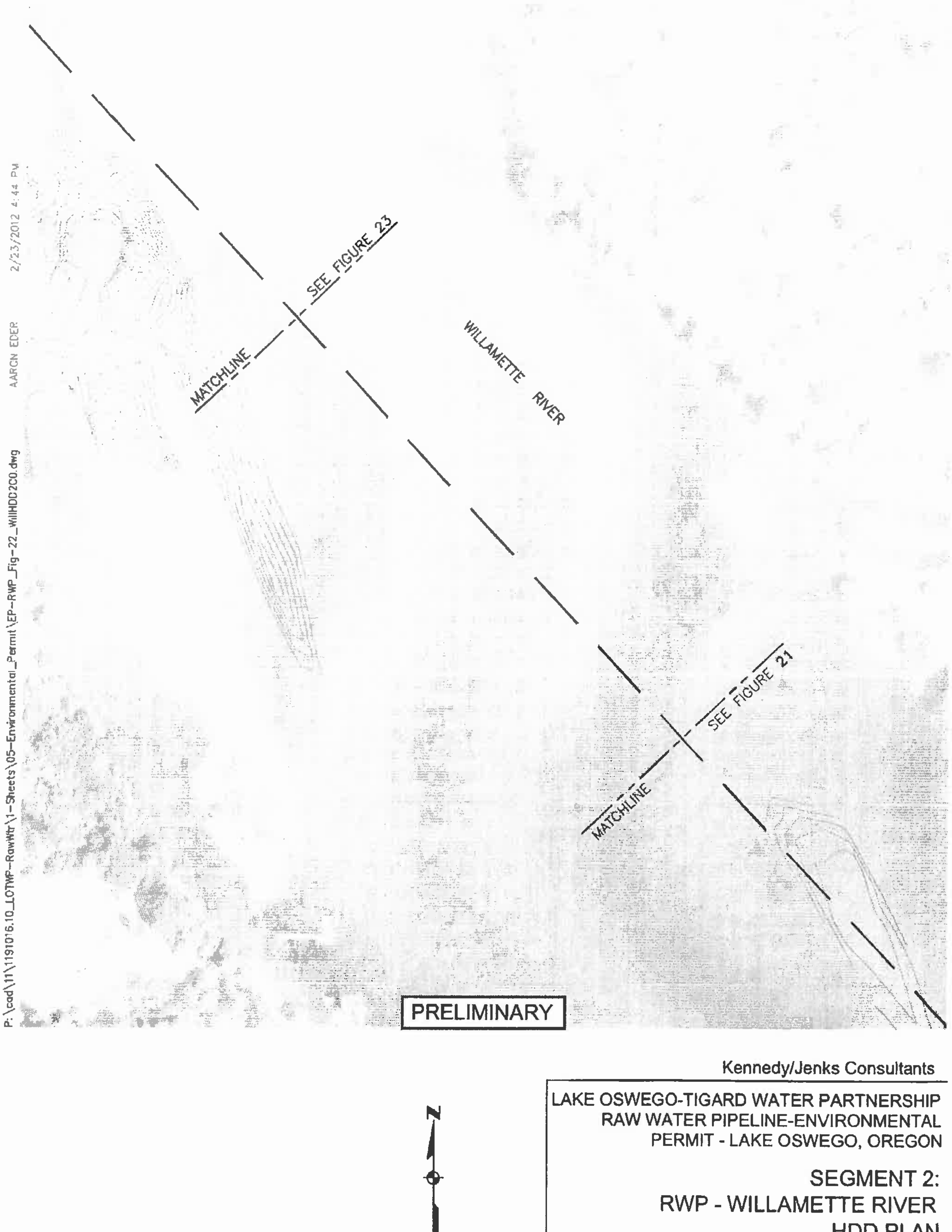


LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

SEGMENT 2:
RWP - WILLAMETTE RIVER
HDD PLAN

K/J 1191016.10

FIGURE 10



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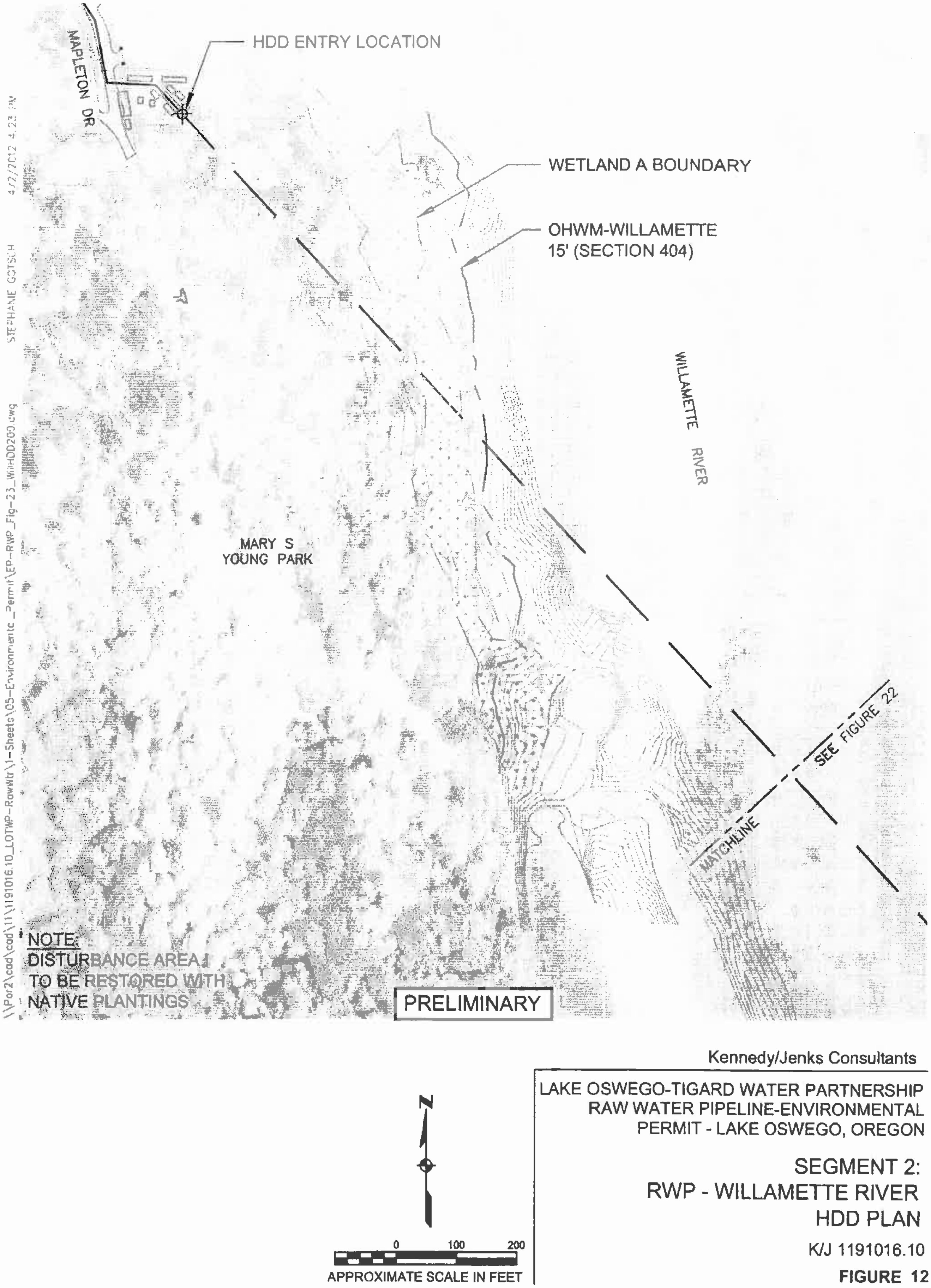
LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

SEGMENT 2:
RWP - WILLAMETTE RIVER
HDD PLAN

K/J 1191016.10

FIGURE 11



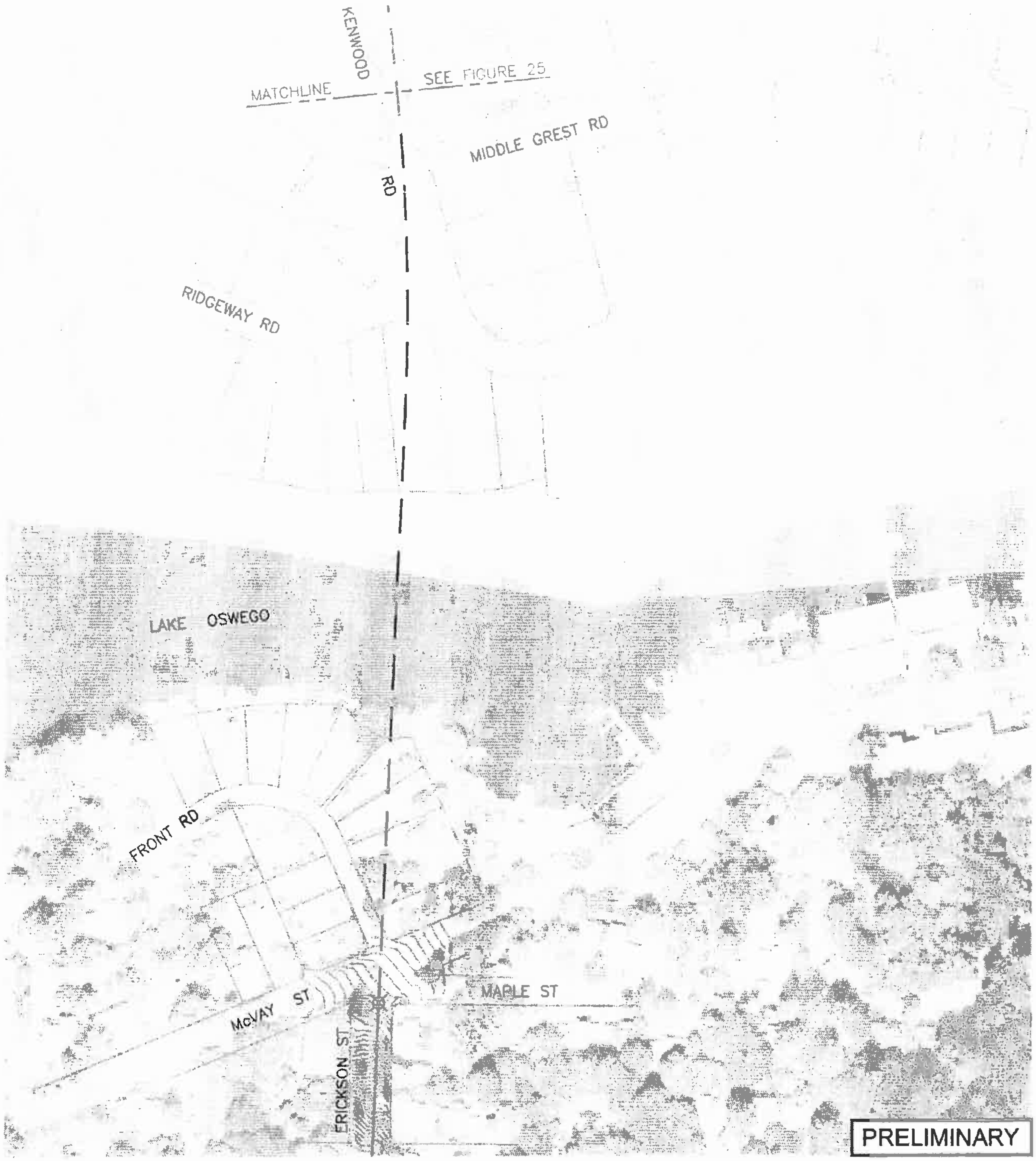
Kennedy/Jenks Consultants

LAKE OSWEGO-TIGARD WATER PARTNERSHIP
RAW WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

SEGMENT 2:
RWP - WILLAMETTE RIVER
HDD PLAN

K/J 1191016.10

FIGURE 12



0 100 200

APPROXIMATE SCALE IN FEET

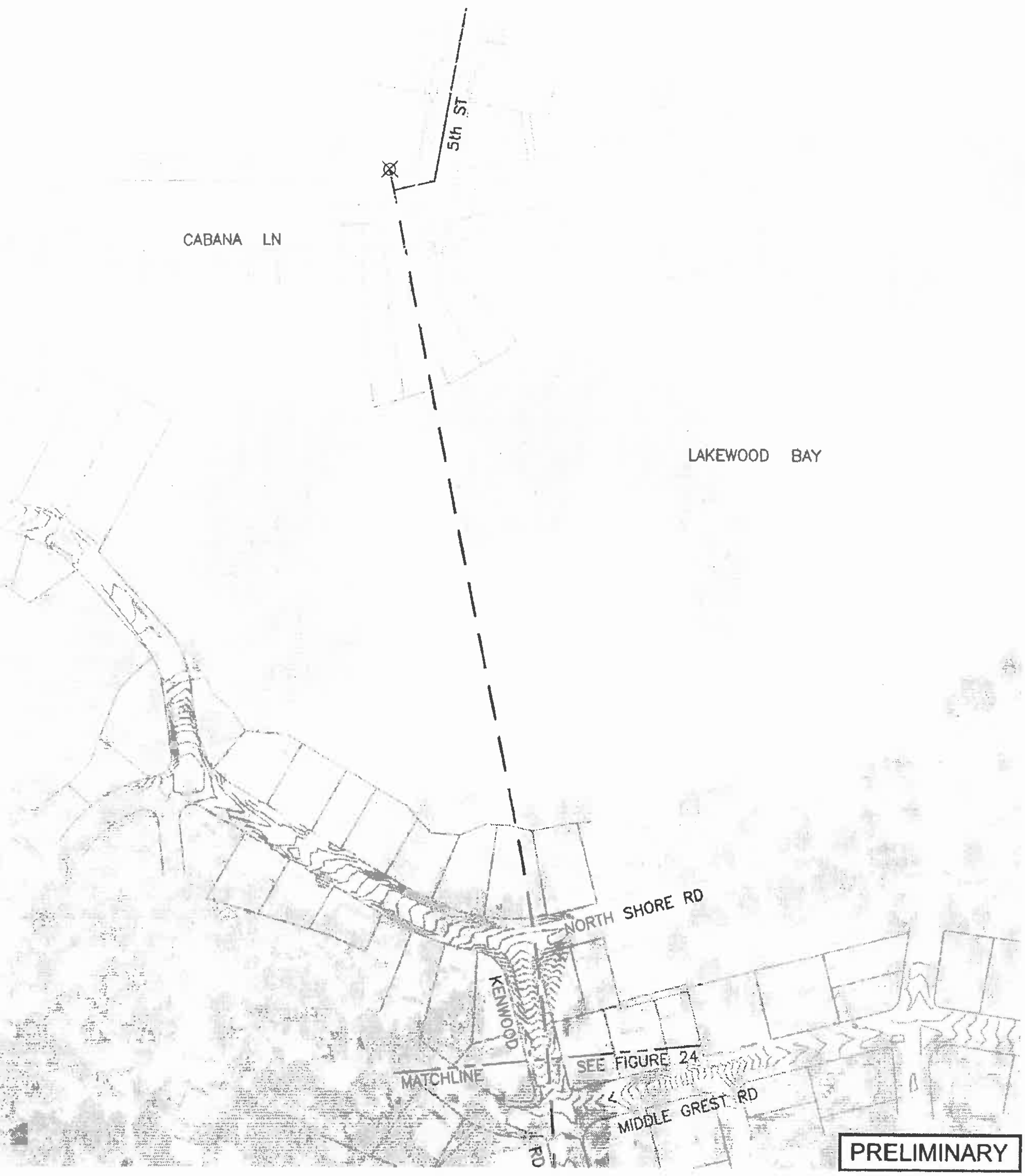
Kennedy/Jenks Consultants

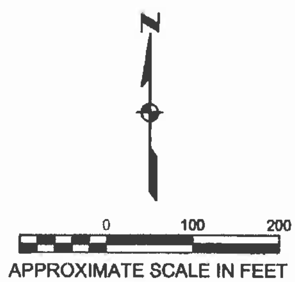
LAKE OSWEGO-TIGARD WATER PARTNERSHIP
FINISHED WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

SEGMENT 2:
FWP - LAKE OSWEGO
HDD PLAN

K/J 1191016.20

FIGURE 13





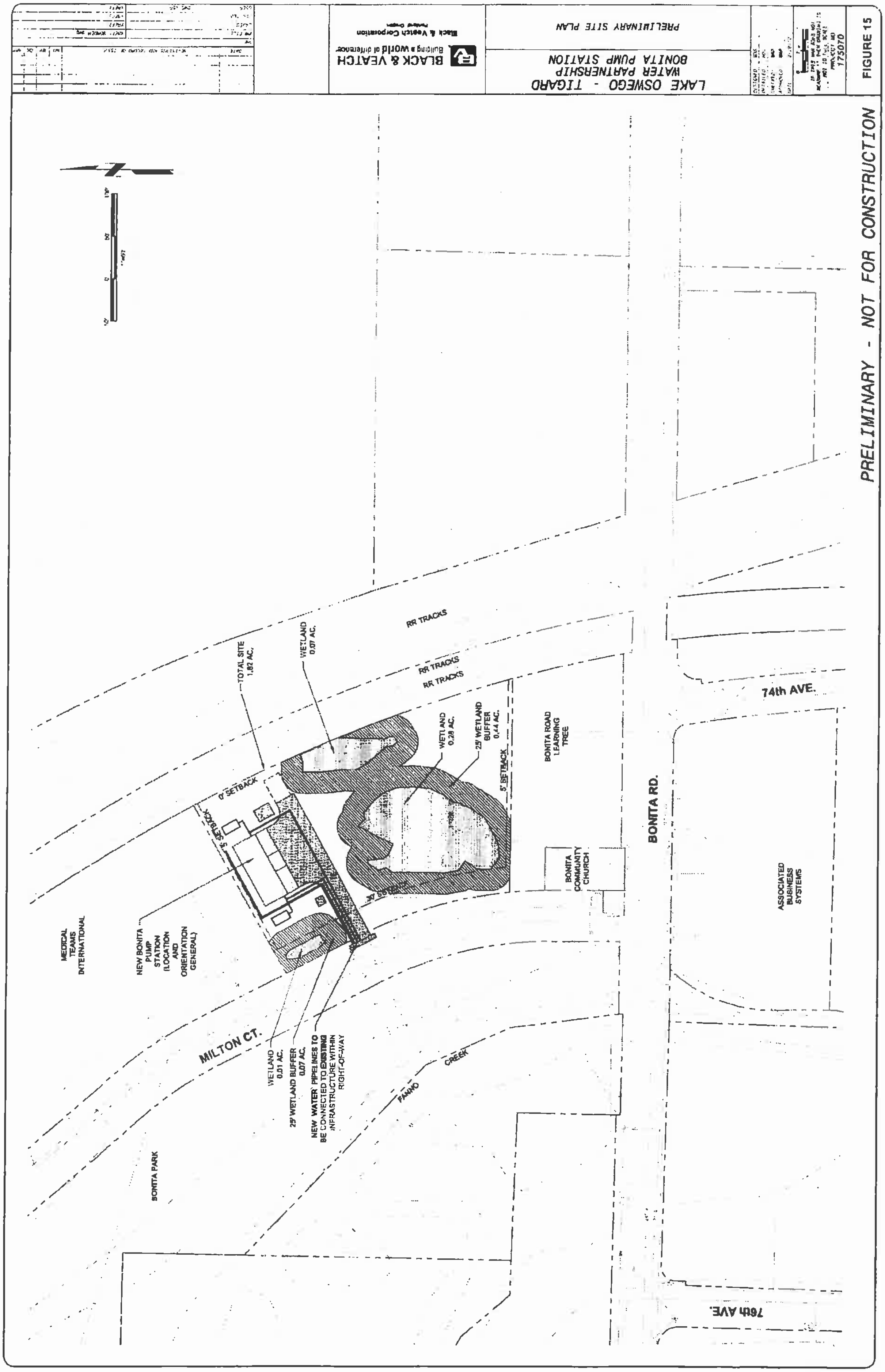
Kennedy/Jenks Consultants

LAKE OSWEGO-TIGARD WATER PARTNERSHIP
FINISHED WATER PIPELINE-ENVIRONMENTAL
PERMIT - LAKE OSWEGO, OREGON

SEGMENT 2:
FWP - LAKE OSWEGO
HDD PLAN

K/J 1191016.20

FIGURE 14


LAKE OSWEGO - TIGARD
WATER PARTNERSHIP
BONITA PUMP STATION
PRELIMINARY SITE PLAN
BLACK & VEATCH
Building a world of difference
Black & Veatch Corporation
175070
FIGURE 15
PRELIMINARY - NOT FOR CONSTRUCTION
RR TRACKS
RR TRACKS
RR TRACKS
TOTAL SITE 1.82 AC.
WETLAND 0.07 AC.
WETLAND 0.28 AC.
25' WETLAND BUFFER 0.44 AC.
5' SETBACK
0' SETBACK
5' SETBACK
30' SETBACK
BONITA ROAD LEARNING TREE
BONITA RD.
74th AVE.
ASSOCIATED BUSINESS SYSTEMS
BONITA COMMUNITY CHURCH
MEDICAL TEAMS INTERNATIONAL
NEW BONITA PUMP STATION (LOCATION AND ORIENTATION GENERAL)
MILTON CT.
WETLAND 0.01 AC.
25' WETLAND BUFFER 0.07 AC.
NEW WATER PIPELINES TO BE CONNECTED TO EXISTING INFRASTRUCTURE WITHIN RIGHT-OF-WAY
FANNO CREEK
BONITA PARK
76th AVE.

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

Appendix E: Erosion and Sediment Control Plan

PRELIMINARY EROSION AND SEDIMENT CONTROL PLAN

RIVER INTAKE PUMP STATION

Prepared for

Lake Oswego-Tigard Water Partnership

February 17, 2012

Prepared by:

Mike Peebles, PE - Otak, Inc.

Reviewed By:

Black & Veatch

Note: Portions of this Plan are taken from the "Construction Sequencing and Conceptual Erosion and Sediment Control Plan – River Intake Pump Station" prepared by Brown and Caldwell, dated July 8, 2011. The conceptual EC plan has been updated based on the current construction sequencing plan and the inclusion of the river channelization work.

LIST OF FIGURES

(Reference figures for this document are from joint permit application for LOTWP RIPS prepared by Black & Veatch)

Site Conditions

The existing and expected final conditions of the project site are described below; anticipated site disturbances during construction are also summarized.

Existing

The project property area is approximately 0.29 acre and is owned by the City. The project property area is comprised of approximately 0.13 acre of paved parking, upland vegetation, a steep, vegetated embankment to the Clackamas River, and riverfront property to an OHW elevation of 17. The paved parking area is located at the top of the bank (elevation of 55 NGVD 29). The embankment to the Clackamas River is heavily vegetated with blackberries, ivy, and large deciduous trees growing out of the face of the slope.

The existing RIPS is located within the project property area. Originally constructed in 1968, the existing RIPS consists of a tower structure located in the Clackamas River that contains the raw water pumps, wet well, and vertical flate-plate intake screens.

Developed

The new RIPS will be located in the Clackamas River approximately 20 feet upstream of the existing RIPS. The new RIPS will consist of a tower structure that houses the raw water pumps, wet well, and intake screens. An access bridge will connect the paved parking area to the tower structure. Slope protection of the existing river bank will be provided in the proximity of the new RIPS access bridge by a secant pile wall that is integrated into the bridge bent construction on the shore.

As part of the construction of the new RIPS, the existing RIPS facility will be demolished to within 2 feet of grade level. The remaining concrete base will be filled with rock and covered with rip-rap. . The demolition methods are constrained to a top-down method employing extensive saw cutting and crane hoisting of materials to on-shore trucks for disposal.

Excavation within the existing river bed will be required to provide proper channelization of flows to the new RIPS facility. This river channelization work will occur upstream of the RIPS facility on the right bank of the Clackamas River.

Construction Site Disturbance Summary

Construction activities will require land outside of the project property boundary to accommodate equipment mobilization, material storage, and equipment and personnel access. The total project site is approximately 0.85 acre and is comprised of temporary construction staging areas, the project property area, and in-water work area (below an OHW elevation of 17), as shown in Figure 3.

Temporary Construction Staging Area

Temporary construction easements will be obtained from the City of Gladstone adjacent to the project property area, The temporary construction staging areas are approximately 0.17 acre total and will be used for equipment and materials staging and storage.

This section describes the administrative activities related to erosion and sediment control to be implemented at various stages of construction; the construction activities that will occur during each construction phase; and the erosion prevention and sediment control BMPs to be implemented during each construction phase.

Appendix A provides a tabular summary and schedule of BMP implementation during each construction phase. BMPs have been organized based on their use for 1) erosion prevention, 2) sediment control, and 3) pollution prevention.

Administrative Erosion and Sediment Control Activities

To ensure that appropriate erosion and sediment control measures are implemented, inspected, and maintained during the duration of construction activities, designation of a Contractor Environmental Coordinator and/or Owner Environmental Inspector may be necessary. Responsibilities and/or duties of such personnel as related to erosion and sediment control may include the following:

- Installation and inspection of erosion prevention and sediment control measures (BMPs)
- Training of staff on appropriate erosion prevention and sediment control measures (BMPs)
- Field documentation and compliance with monitoring requirements (if any)

The following sections detail the administrative activities related to erosion prevention and sediment control that will be conducted by the designated Contractor Environmental Coordinator and/or Owner Environmental Inspector prior to, during, and following construction. Such activities can be referenced in Appendix A under Pollution Prevention BMPs also.

Pre-Construction Administrative Activities

Administrative activities related to erosion control prior to construction could include the following:

- Discuss procedures, requirements, guidelines and any other relevant issues with the project Owner and/or authorized representative from Clackamas County Water Environment Services (WES).
- Conduct project start-up training for staff, subcontractors, and other personnel related to environmental protection requirements.
- Prepare inspection logs and field notebooks to collect and record the results of erosion control inspection activities.

Construction Administrative Activities

Administrative activities related to erosion control during construction could include the following:

- Oversee the phasing and installation of erosion prevention and sediment control BMPs.
- Conduct inspections and daily maintenance of all installed erosion prevention and sediment control BMPs. Record inspection results.
- Identify and respond (via the addition or modification of erosion prevention and sediment control BMPs) to changes in site conditions for the duration of construction.

administrative BMPs) is described in additional detail under Administrative Erosion and Sediment Control Activities. The designated project site area boundary will be described during the meeting, and following the meeting, identified through the installation of perimeter controls (construction fencing) around the portion of the project area perimeter that is publicly accessible. In conjunction with the installation of perimeter controls, areas where natural vegetation is to be preserved will be identified specifically and flagged.

The construction site entrance will be located at the western edge of the project site area. The construction site entrance will be comprised of wood curb ramp or other feasible application considering that the entrance is located on a paved surface. A wheel wash is not proposed given that vehicle travel will be isolated primarily to paved surfaces.

Type V catch basin inserts will be installed at the one catch basin located within the project site area and within catch basins along Clackamas Avenue where increased construction traffic is anticipated. Silt fencing will be installed at the edge of pavement along the construction staging and existing parking areas at the top of the slope. Depending on site and in-stream flow conditions in the Clackamas River, additional silt fencing may be installed at the edge of the embankment above ordinary high water.

After initial erosion control measures are installed, heavy construction equipment will be mobilized at the site. Steel plating or oak matting may be applied over the existing asphalt surface to protect and preserve the existing pavement. Equipment to be mobilized onsite includes large cranes, excavation equipment, cement mixers, and cofferdam installation equipment. Activity zones for material loading and unloading, crane assembly, and equipment staging will be demarcated. Additionally, secondary containment and spill prevention BMPs will be implemented surrounding areas where equipment mobilization (crane assembly) and equipment transport will occur.

Phase 2: Site Clearing and Grubbing

Site clearing activities will occur primarily within the existing asphalt parking and roadway area and within the proposed location of slope protection adjacent to the proposed intake structure bridge Site clearing and grubbing activities may occur in conjunction with activities described under Phase 1, for purposes of BMP implementation. Specific activities include the following:

- removal of identified trees necessary for construction access (per approved tree removal plan)
- temporary removal of the existing vegetated island located within the temporary construction staging area
- ground cover thinning in the location of the proposed temporary access ways (see construction Phase 1)

Due to the nature of the steep riverbank, it will be important to avoid bank disturbances and maintain native (natural) vegetation where possible. Natural vegetation will be preserved to the extent possible. Additionally, sediment control BMPs implemented during Phase 1 will be preserved.

Site clearing and grubbing activities will occur within the construction limits identified by the installed perimeter controls and silt fencing. The contractor may initiate some ground cover thinning for construction of temporary access stairs to the bottom of the bank or where the proposed RIPS access bridge will be constructed (see construction Phase 1).

activities will be conducted consistent with criteria and BMPs outlined in the Standard Local Operating Procedures for Endangered Species to Administer Maintenance or Improvement of Road, Culvert, Bridge and Utility Line Actions Authorized or Carried Out by the U.S. Army Corps of Engineers in Oregon (SLOPES IV Roads, Culverts, Bridges, and Utility Lines).

Phase 4: Site Grading and Foundation Construction (RIPS Structure)

Site grading and excavation will occur within the project site area along the Clackamas River embankment, adjacent to the proposed RIPS footprint. Site grading and excavation will be conducted to create a suitable and level rock base on which to build the RIPS foundation access bridge and install a secant pile wall for slope protection. Erosion prevention and sediment control BMPs described in construction Phases 1 through 3 will continue to be implemented.

Grading to support construction of the RIPS foundation and installation of the access bridge and slope protection wall may occur through rock chipping with excavating equipment into the basalt layer. Rock chipping and blasting (if required) will be conducted in accordance with conditions and BMPs outlined in SLOPES IV and identified as conditions in the issued state and federal permit(s).

Spill containment and other pollution prevention BMPs (Appendix A) will be implemented within the dewatered construction area in addition to the asphalt surface at the top of the embankment where construction staging and equipment mobilization is occurring.

Phase 5: River Isolation and Excavation (Upstream of RIPS)

Excavation will occur within the river bed along the north bank of the Clackamas River, upstream of the proposed RIPS, in order to provide proper channelization of flows past the proposed RIPS. Excavation will be completed by a trackhoe that has been walked down the riverbank slope (north of the RIPS) and will work along the shore within the limits of the channel excavation area. The river will be isolated with super sacks and turbidity curtains for the excavation work, but not completely dewatered. If necessary, to reduce turbidity of sediment laden water within the excavation area, water will be pumped and discharged to a treatment or sediment basin on the shore prior to discharge back into the Clackamas River. Work will be completed within the permitted in-water work window. Erosion prevention and sediment control BMPs described in construction Phases 1 through 4 will continue to be implemented.

Removal of the excavated material from the riverbank, and transfer of material and small construction equipment to the work area, will be by use of a crane and hopper assembly at the top of the embankment. Rock chipping and excavation will be conducted in accordance with conditions and BMPs outlined in SLOPES IV and identified as conditions in the issued state and federal permit(s). Spill containment and other pollution prevention BMPs (Appendix A) will be implemented within the construction area in addition to the asphalt surface at the top of the embankment where construction staging and equipment mobilization is occurring.

Erosion prevention and sediment control BMPs implemented during construction Phases 1 through 6 will continue to be maintained during Phase 7. Pollution control BMPs, specifically those related to paving (as applicable) will be implemented (see Appendix A).

Phase 8: Existing RIPS Demolition and Installation of Bank Protection

After the new RIPS is installed and functional, removal of the existing RIPS will occur. During the subsequent Clackamas River in-water work window, installation of a turbidity curtain will occur. Sediment control BMPs implemented and maintained during construction Phases 1 through 5 will remain in place during this activity with the exception of the sediment fence alignment along the existing RIPS.

The structure is proposed to be removed to an elevation 2 feet above grade. Removal of the RIPS may be accomplished by crane-mounted concrete saw cutters, Sections of the existing RIPS will be removed sequentially, beginning at the top of the structure. As described under construction Phase 3, in-water construction activities are to be permitted through the state and federal environmental agencies.

Sediment control BMPs implemented during this construction phase will be removed following completion of the existing RIPS demolition and all soil moving activities. Administrative and pollution control BMPs will continue to be implemented in accordance with the schedule indicated (Appendix A).

Phase 9: Demobilization, Restoration, and Mitigation

Construction activities conducted under construction Phase 9 may occur concurrently with activities conducted under construction Phases 7 and 8.

Demobilization of equipment, specifically the cofferdam and dewatering pumps, will occur following construction and testing of the RIPS (see construction Phase 7) and removal of the existing RIPS (see construction Phase 8). Installation of permanent vegetation will occur in conjunction with onsite vegetation mitigation activities. New landscaping will be planted under construction Phase 7 in conjunction with final design guidelines and criteria. However, vegetation replacement may be necessary following activities outlined under construction Phase 8. Offsite mitigation including plantings and habitat restoration are anticipated also as a result of this project. Such locations have not yet been identified and are not included in this Plan.

Implemented sediment control BMPs including catch basin inserts, sediment fencing, and construction entrance will remain in place during much of this phase of construction. Administrative and pollution control BMPs (Appendix A) are particularly pertinent to this phase and will include ongoing monitoring of the permanent vegetation activities.

Construction Phases

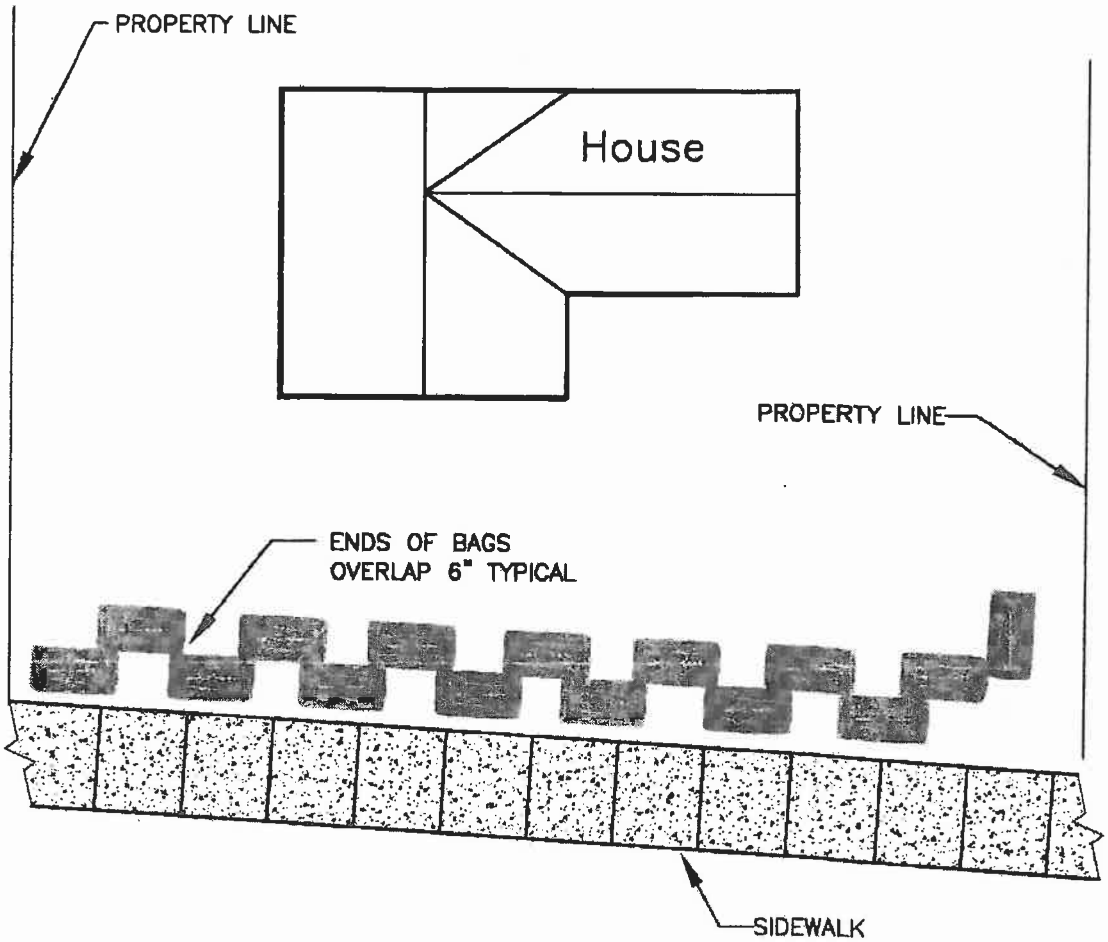
1. Mobilization and Installation of Temporary BMPs
2. Site Clearing and Grubbing
3. River Isolation and Dewatering (RIPS structure)
4. Site Grading and Foundation Construction (RIPS structure)
5. River Isolation and Channel Excavation
6. Facility Construction and Revegetation
7. Utility Connections and Site Civil Construction
8. Existing RIPS Demolition and Installation of Bank Protection
9. Demobilization, Restoration, and Mitigation

BMP Implementation Schedule

BMP	Construction Phase									Reference	Maintenance	Internal Notes
Erosion Prevention	1	2	3	4	5	6	7	8	9			
Preserve Natural Vegetation	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (4-29)	Regular monitoring. Repair fencing and/or flagging and re-cover and/or seal exposed plant roots. Additional inspections required for storm events.	
Dust Control	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (4-7)	Maintain dust control measures through dry weather periods and immediately re-stabilize disturbed areas.	
Matting (Pavement Protection)	✓	✓	✓	✓	✓	✓	✓	✓		WES Manual (4-107)	Requires on-going inspection. Remove any material that is deposited on mats. Remove or replace mats if they are damaged or become unstable.	
Matting (Steep Slopes)		✓	✓		✓			✓		WES Manual (4-17)	Daily inspection.	To be placed on steep slopes once the slope has been cleared and grubbed. Contractor may consider installation of waddles.
Plastic Sheeting		✓	✓	✓	✓	✓	✓	✓		WES Manual (4-28)	Daily inspection.	For any material storage or other excavated materials kept on-site.
Seeding (Permanent Revegetation)					✓	✓	✓		✓	WES Manual (4-33)	Inspect newly seeded areas frequently to ensure grass is growing. Spot seed or re-seed and mulch as needed. Repair any sources of erosion or runoff that damages seeded area.	
Hydraulic Application Seeding						✓	✓		✓	WES Manual (4-14)	Daily inspection when first applied and regular monitoring after 7 days	May be used instead of seeding (permanent revegetation) due to slope and access.
Perimeter Control (Orange Construction Fencing)	✓	✓	✓	✓	✓	✓	✓	✓	✓	Not in Manual	Repair or replace damaged fencing.	
Sediment Control	1	2	3	4	5	6	7	8	9			
Construction Entrance	✓	✓	✓	✓		✓	✓	✓	✓	WES Manual (4-84)	On-going inspections with daily cleaning of sediment that is tracked onto the pavement.	
Inlet Protection Type 5	✓	✓	✓	✓		✓	✓	✓	✓	WES Manual (4-104)	Regular monitoring and cleaning/removal of debris. Additional inspections required for storm events.	Used for inlets and catch basins that are on-site and in the street.
Silt Fence	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (4-125)	Regular monitoring and removal of accumulated sediment and debris. Additional inspections required for storm events.	To be placed on-site. (Needs to be placed on the contour.)
Dewatering/Sediment Basin			✓	✓	✓	✓		✓		Dewatering: WES Manual (4-85) and SLOPES IV (page 11, no. 23) Sediment Basin: WES Manual (4-119)	Continuous monitoring of equipment, periodic inspection/maintenance of discharge area and sediment barrier. Remove sediment when the sediment storage zone is half full. Repair damages from erosion or construction equipment before the end of each working day.	
Supersacks/Turbidity Curtain			✓		✓			✓		Contractor to specify.	Daily inspection.	
Cofferdam			✓	✓		✓	✓	✓		To be specified during detailed design.	Daily inspection	

BMP Implementation Schedule

BMP	Construction Phase									Reference	Maintenance	Internal Notes
Pollution Control	1	2	3	4	5	6	7	8	9		**Monitoring And Maintenance**	
Dewatering Operations			✓	✓		✓		✓		WES Manual (5-9)	Continuous monitoring of equipment, periodic inspection/maintenance of discharge area and sediment barrier.	
Paving Operations							✓		✓	WES Manual (5-10)	Monitor equipment to avoid spills and pave during dry conditions	
Structure Construction And Painting						✓				WES Manual (5-11)	Proactive planning to limit risk of a spill of paints or chemicals during construction at site.	
Material Delivery And Storage	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (5-12)	Inspection of material containment equipment.	
Material Use	✓	✓	✓	✓		✓	✓	✓	✓	WES Manual (5-14)	Use environmentally friendly alternative materials	
Spill Prevention And Control		✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (5-15)	Maintain equipment within spill containment systems and provide for immediate spill cleanup.	
Solid Waste Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (5-17)	Provide waste collection to remove potential for solid waste to contaminate storm water.	
Hazardous Waste Management	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (5-18)	Provide for disposal and employee training of hazardous waste.	
Concrete Waste Management				✓		✓	✓	✓		WES Manual (5-21)	Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.	
Vehicle/Equipment Maintenance	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (5-22)	Clean equipment and vehicles using methods to avoid contamination of storm water.	
Vehicle/Equipment Fueling	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (5-23)	Fuel in designated facilities or off-site to reduce chance of a fuel spill.	
Subcontractor Training	✓	✓	✓	✓	✓	✓	✓	✓	✓	WES Manual (5-25)	Train subcontractors in the proper use of these BMPs.	



PLAN VIEW
NTS

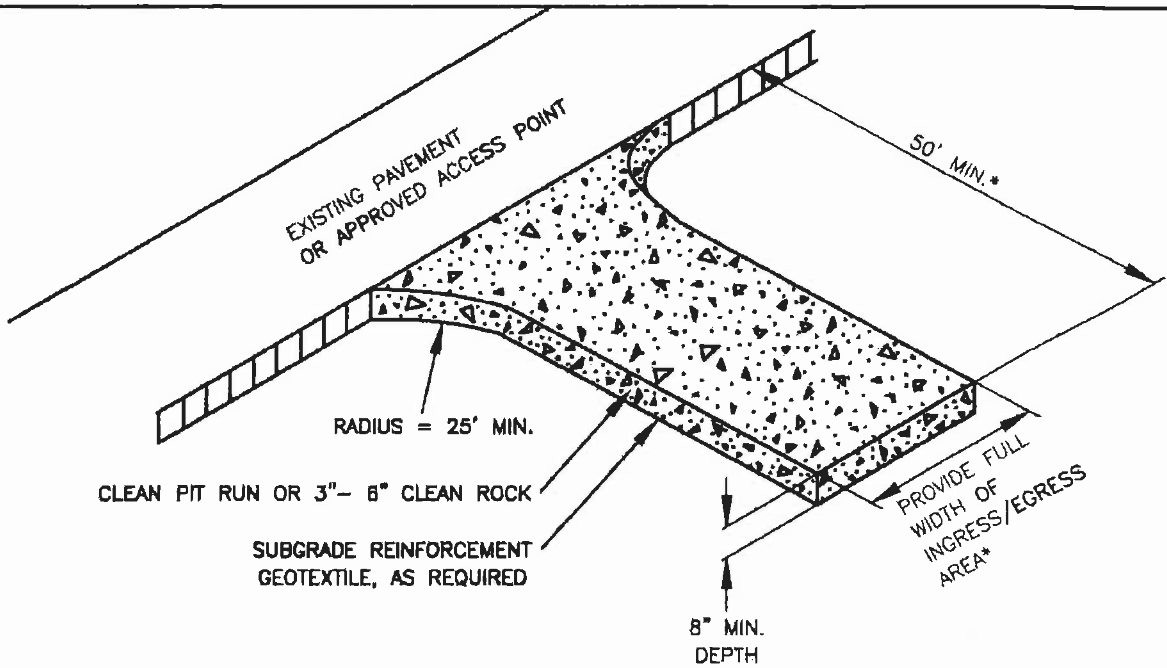
NOTE:

1. STAKING OF BAGS REQUIRED USING (2) 1"x2" WOOD STAKES OR APPROVED EQUAL PER BAG.
2. BAGS ARE USED AS ALTERNATE FOR SEDIMENT FENCE FOLLOWING INSTALLATION OF SIDEWALK ON SINGLE FAMILY CONSTRUCTION ONLY.

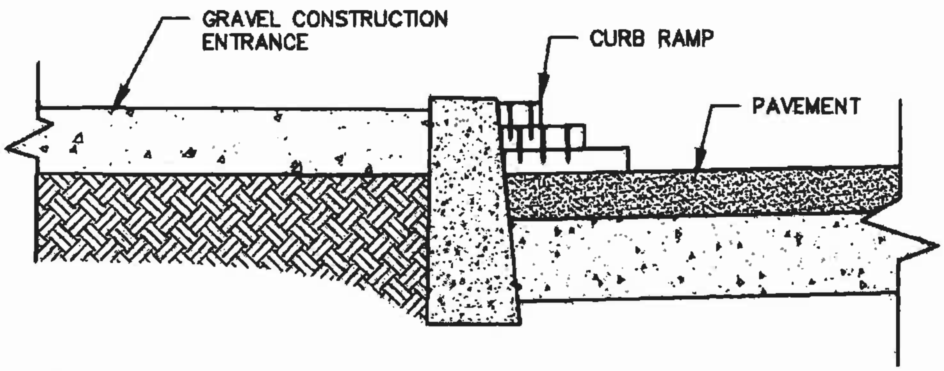
BIO-FILTER BAGS

DETAIL DRAWING 4–12

REVISED 01–09



*20' MIN. FOR SINGLE FAMILY AND DUPLEX RESIDENTIAL

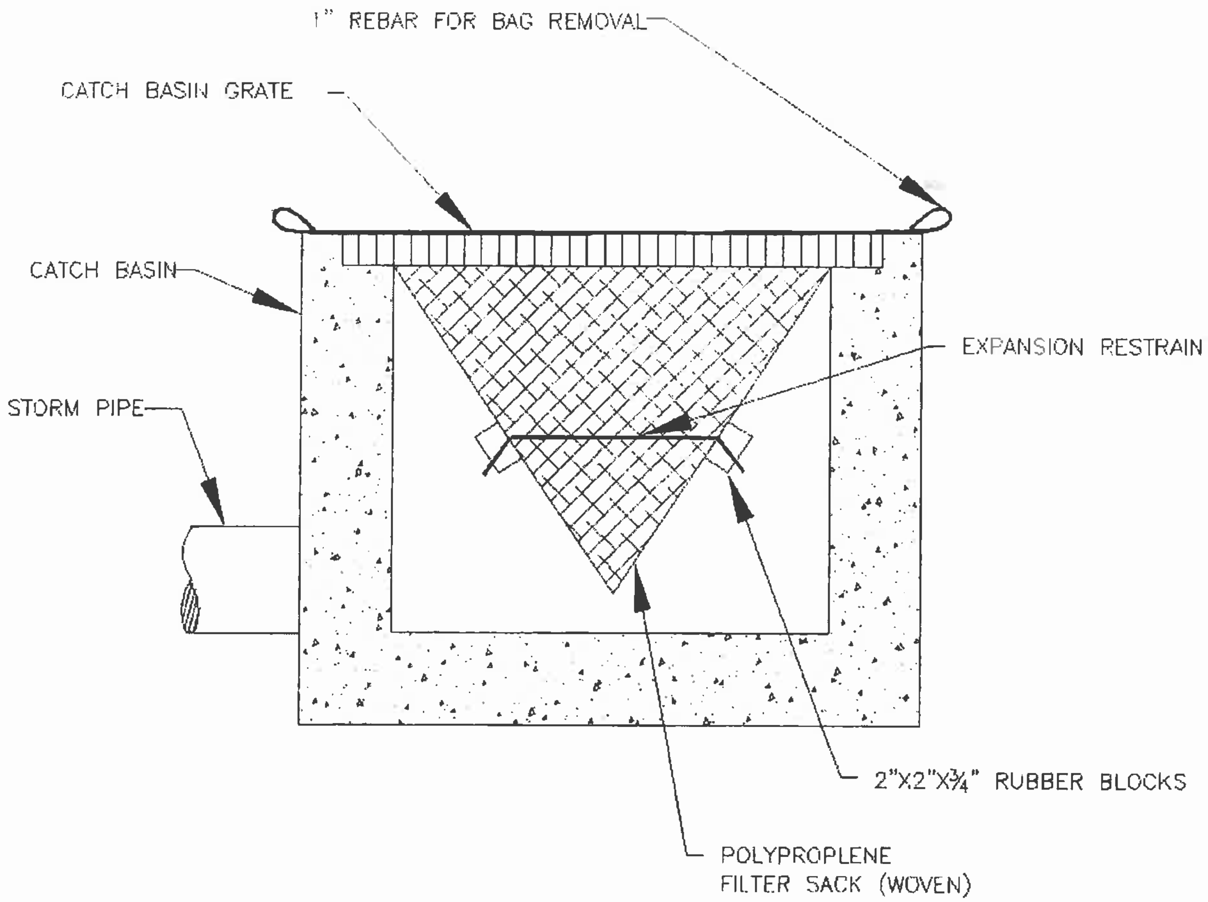


NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF- WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY
   20' LONG BY 20' WIDE 8" DEEP OF ¾" MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE 3-6" CLEAN ROCK.
   GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB-SOIL PUMPING.

CONSTRUCTION ENTRANCE

DETAIL DRAWING 4-13 REVISED 01-09



WOVEN POLYPROPLENE SACK

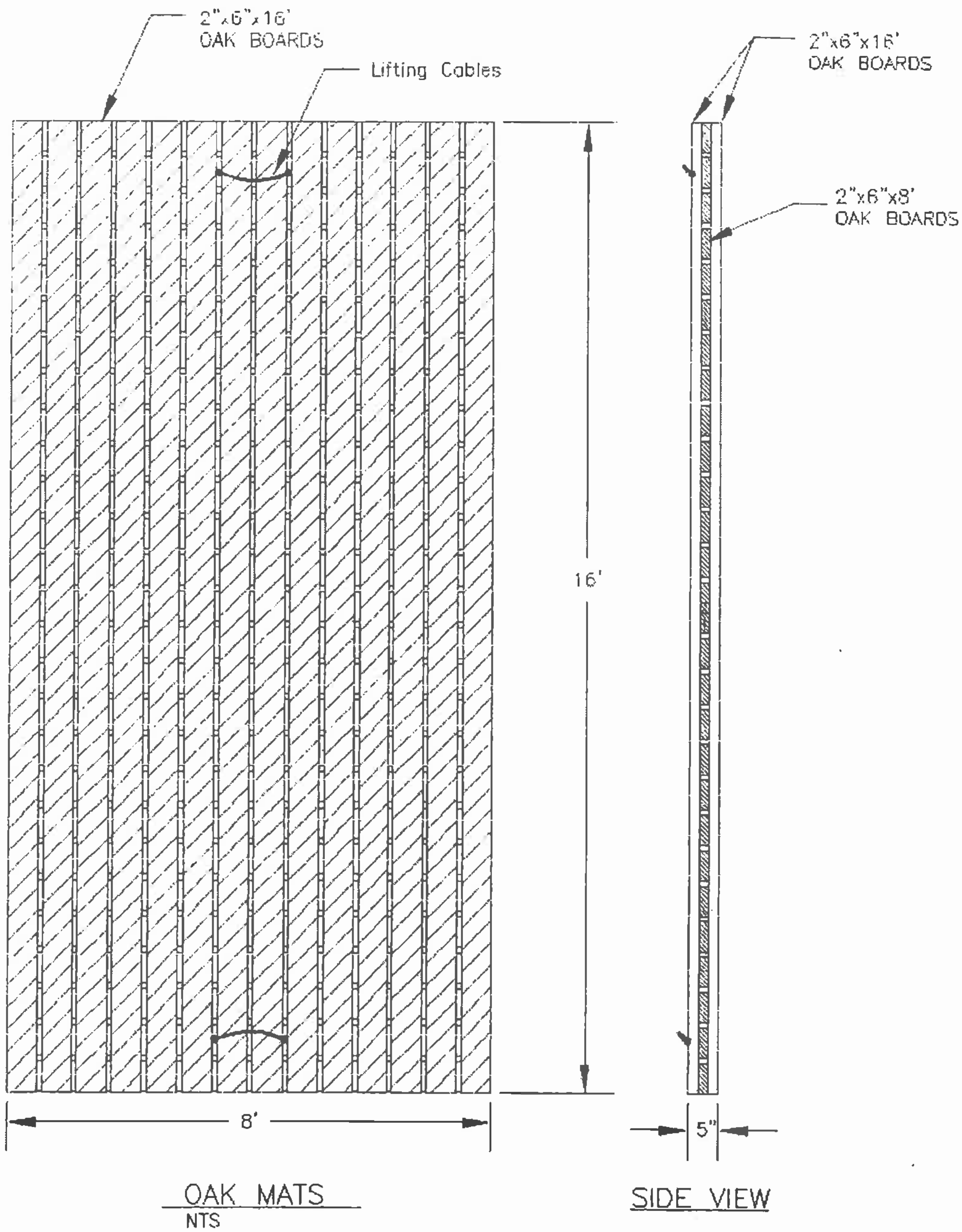
NOTE:

1. RECESSED CURB INLET CATCH BASINS MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACKS TO BE DETERMINED BY MANUFACTURER.

INLET PROTECTION TYPE 5

DETAIL DRAWING 4–19

REVISED 01–09

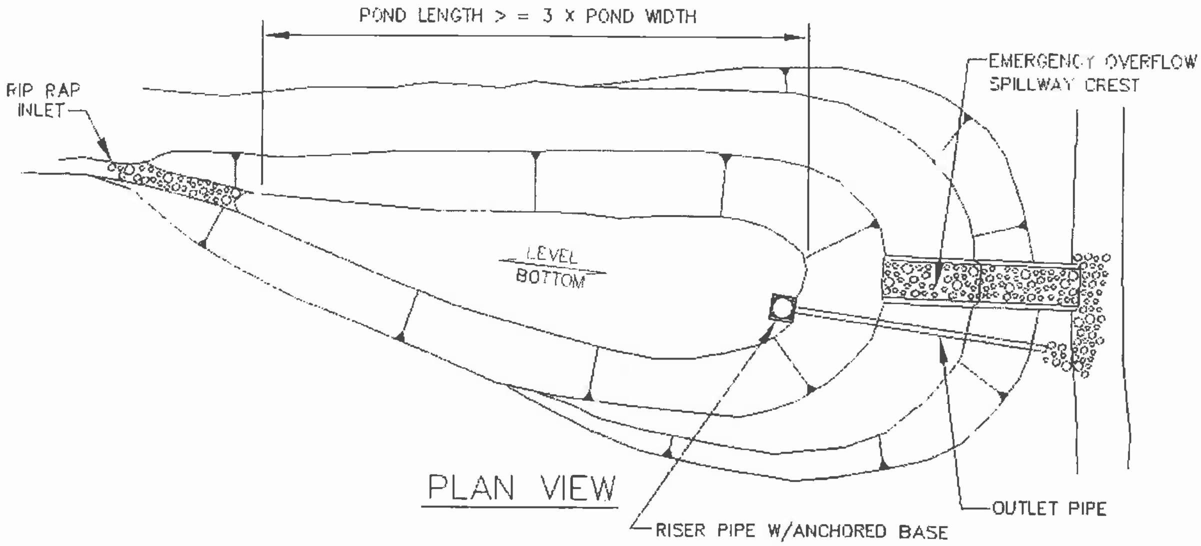


NOTE:
1. CONSTRUCTED OF 2"x6" OAK.

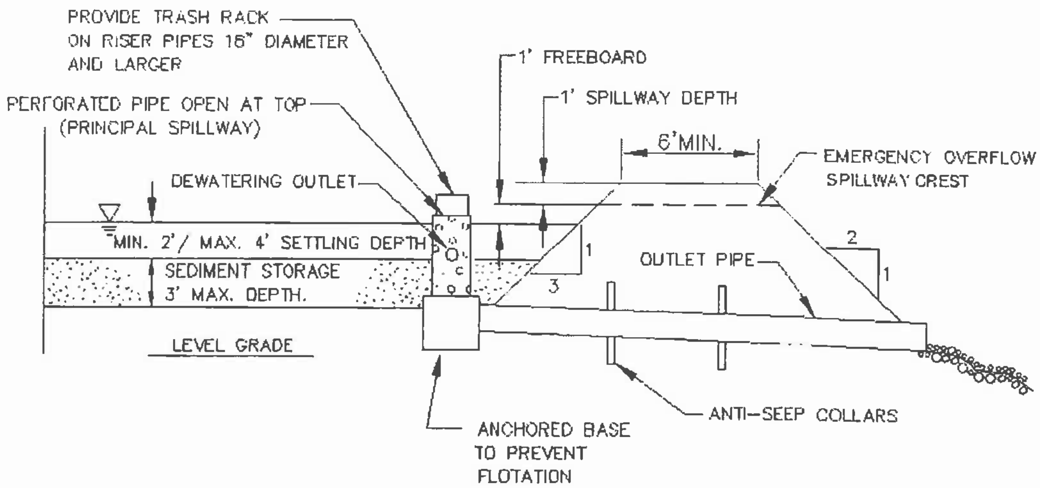
OAK MATS

DETAIL DRAWING 4-21

REVISED 01-09



PLAN VIEW

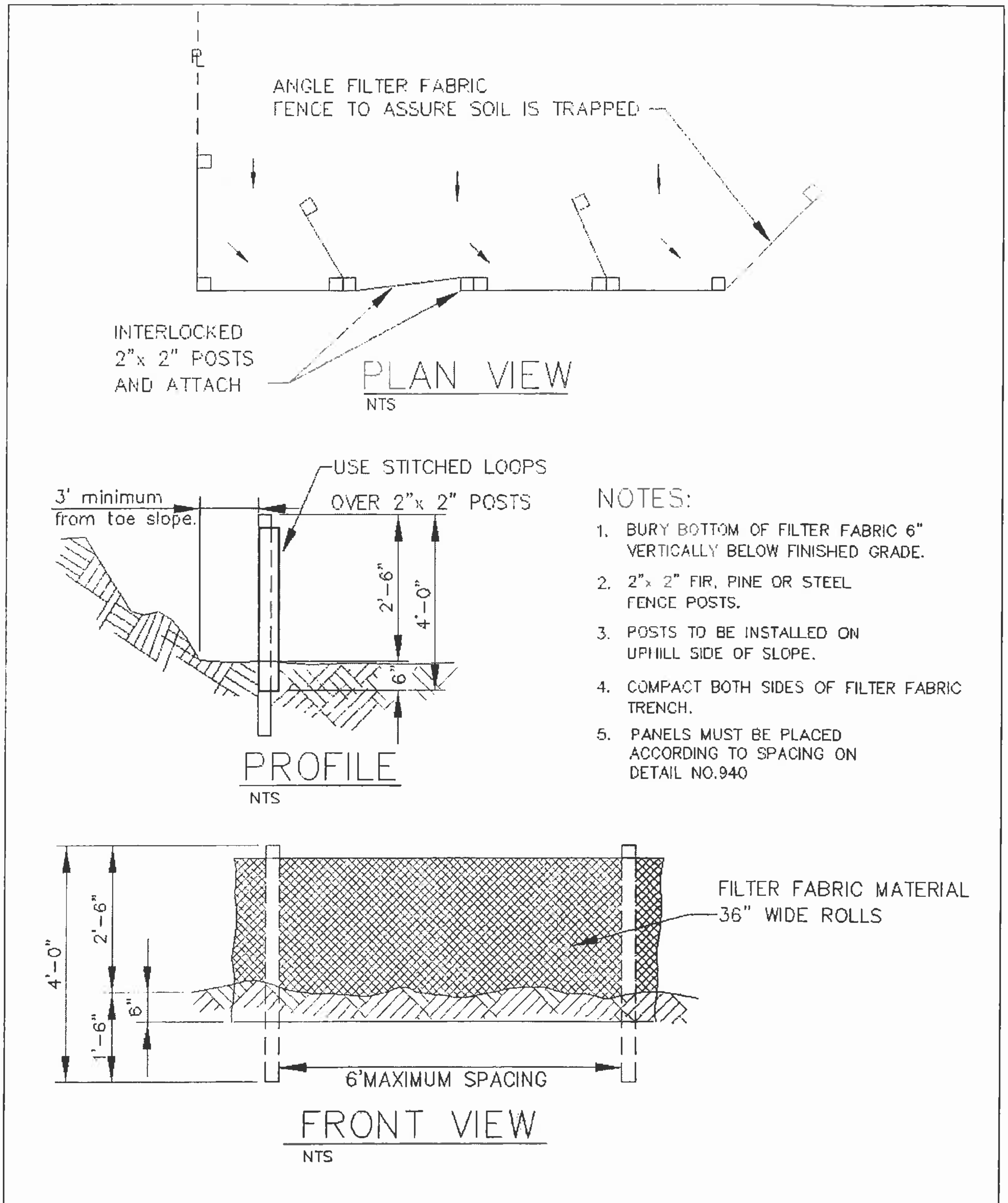


PROFILE

NOTE:
50' MINIMUM OF HIGHLY VEGETATED AREA AND OR SEDIMENT FENCE IS REQUIRED PRIOR TO DISCHARGING TO STREAM OR WETLAND.

SEDIMENT BASIN

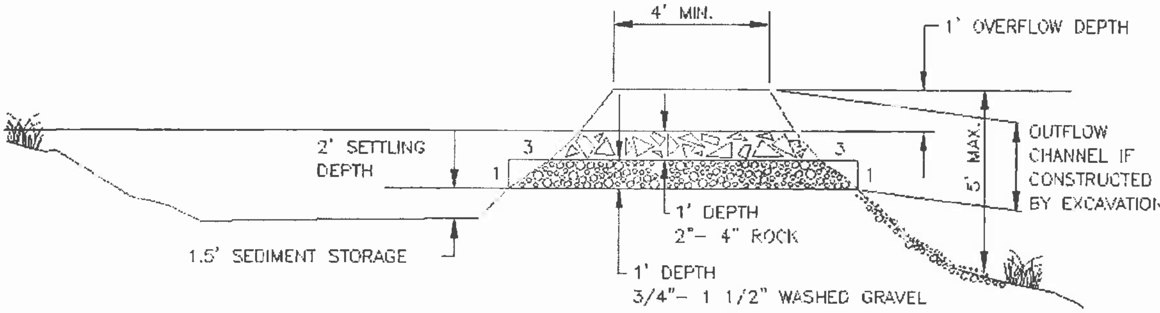
DETAIL DRAWING 4-22 REVISED 01-09



SEDIMENT FENCE

DETAIL DRAWING 4-23

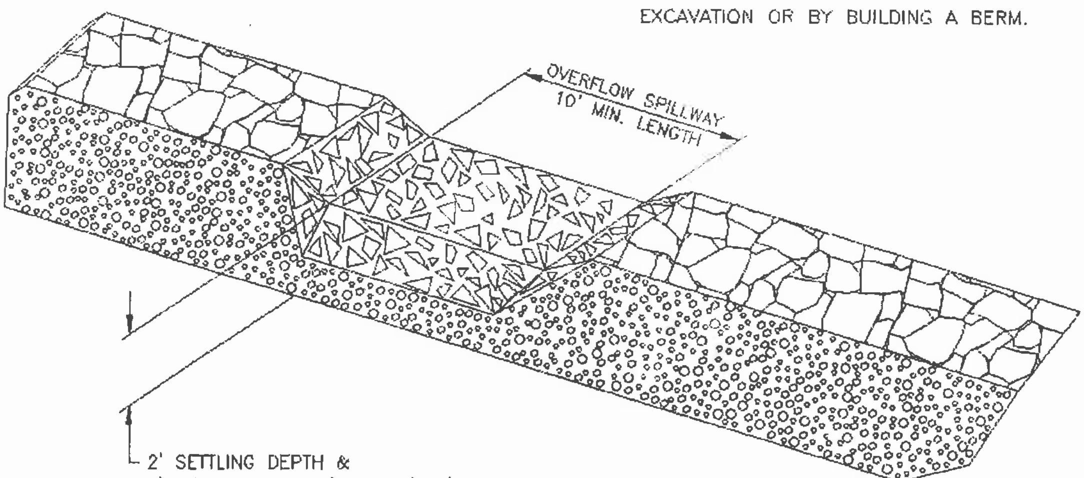
REVISED 01-09



CROSS SECTION

NTS

NOTE: MAY BE CONSTRUCTED BY EXCAVATION OR BY BUILDING A BERM.



SEDIMENT TRAP OUTLET

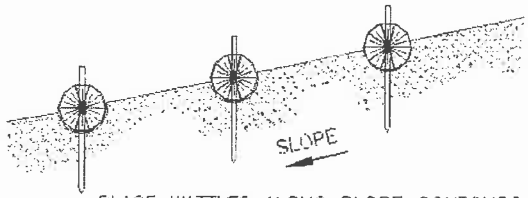
NTS

NOTE:
A FILTER FABRIC FENCE OR SIMILAR FILTER MUST BE CONSTRUCTED TO FILTER RUNOFF FROM THE SEDIMENT TRAP PRIOR TO DISCHARGE FROM THE CONSTRUCTION SITE.

SEDIMENT TRAP

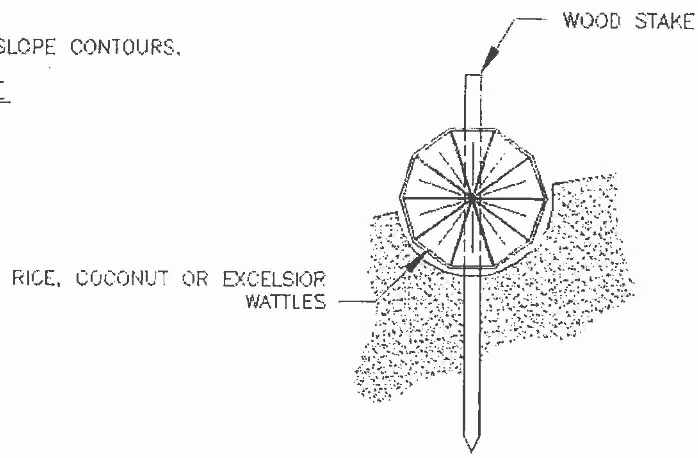
DETAIL DRAWING 4-24

REVISED 01-09

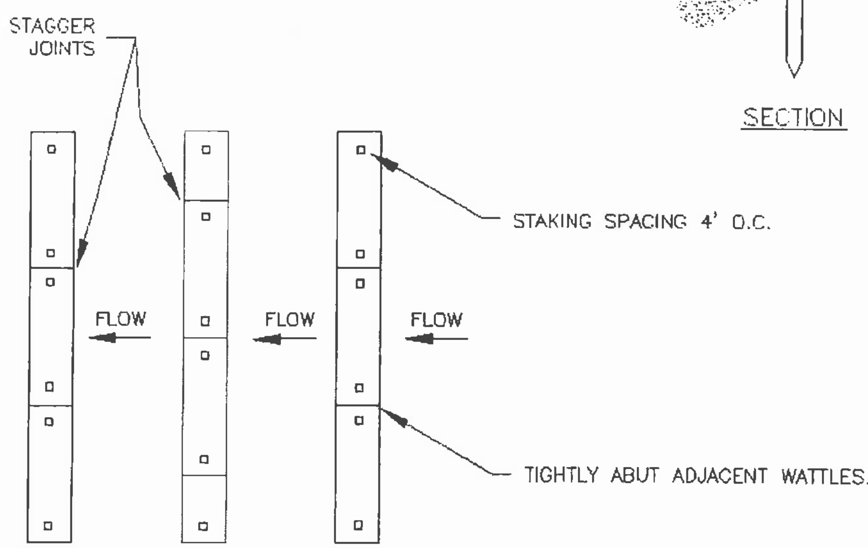


PLACE WATTLES ALONG SLOPE CONTOURS.

PROFILE



SECTION



PLAN VIEW

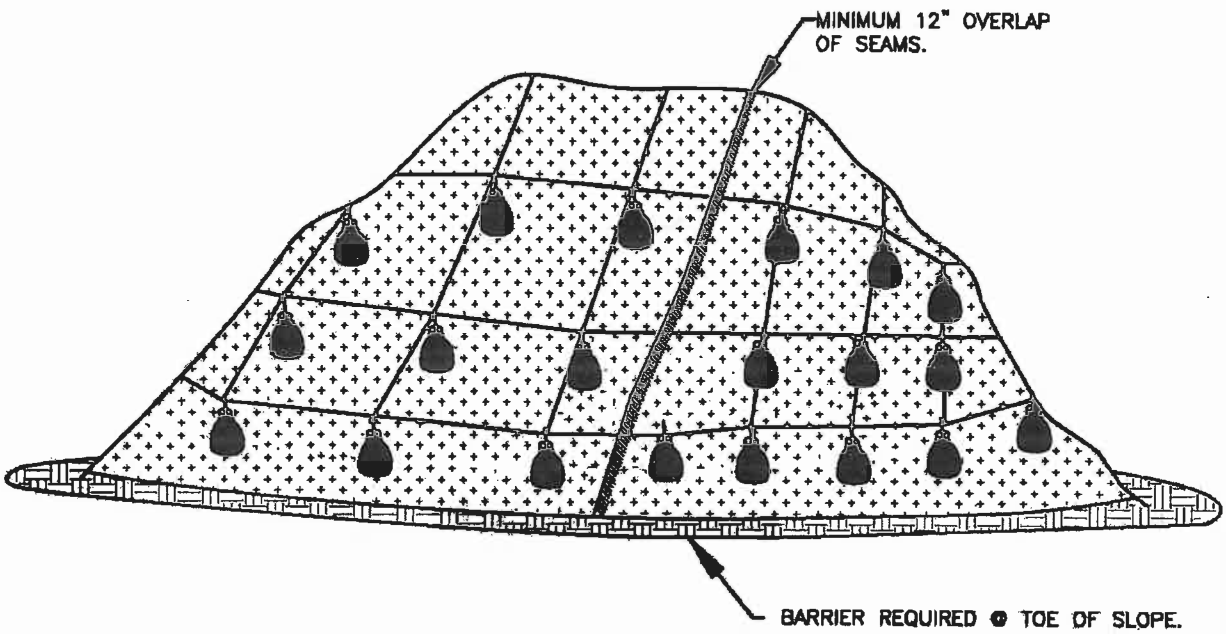
NOTES:

1. STAKING SPECIFICATIONS:
   a. 1"X2" WOODEN STAKES
   b. ADDITIONAL STAKES MAY BE INSTALLED ON DOWNHILL SIDE OF WATTLES, ON STEEP SLOPE OR HIGHLY EROSIVE SOILS.
2. SPACING IN ACCORDANCE WITH DETAIL 940.

WATTLES

DETAIL DRAWING 4-27

REVISED 01-09



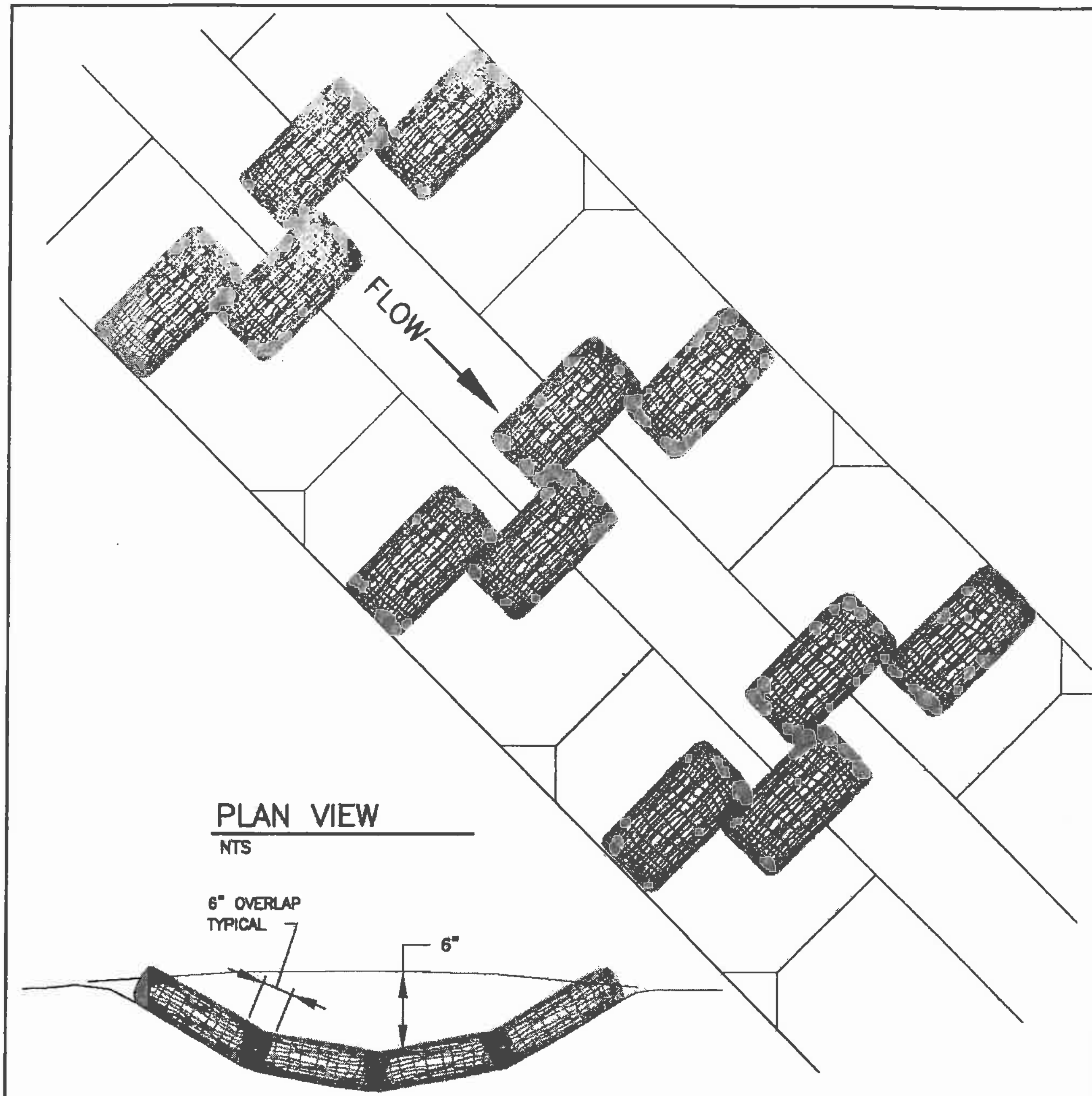
PLASTIC SHEETING

NOTES:
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.

PLASTIC SHEETING

DETAIL DRAWING 4-3

REVISED 01-09



PLAN VIEW
NTS

PROFILE
NTS

NOTES:

1. STAKING OF BAGS REQUIRED USING (2) 1"X2" WOOD STAKES OR APPROVED EQUAL PER BAG.
2. SURFACE MUST BE SMOOTH BEFORE APPLICATION.
3. CHECK DAMS CAN BE CONSTRUCTED USING STRAW WATTLES OR OTHER MATERIALS AS APPROVED BY THE DISTRICT OR CITY.

CHECK DAM - BIO-FILTER BAGS

DETAIL DRAWING 4-5

REVISED 01-09

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

Appendix F: Alternatives Analysis

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

Brown AND Caldwell

Technical Memorandum

Date:	April 17, 2012
Prepared for:	Lake Oswego Tigard Water Partnership
Subject:	Joint Permit Application Alternatives Analysis
To:	Karla Ellis, Project Manager, Portland District, USACE
	Mike Turaski, Section Chief, Portland District, USACE
From:	Terry Buchholz, Project Permitting Task Lead Integrated Water Solutions, LLC

CONTENTS

Tables

Figures

1 INTRODUCTION

In August 2008, the cities of Lake Oswego and Tigard (the "Project Sponsors") entered into a partnership agreement for sharing drinking water resources and costs. Lake Oswego's water supply system was nearing capacity, and key facilities needed expansion and upgrades. Tigard residents needed a secure, dependable water source. Both cities want to keep water affordable for their customers, and sharing the cost of new infrastructure to serve both communities does that. Sharing water resources isn't new. Lake Oswego and Tigard have benefitted from a water sharing relationship dating back to the 1970s—Lake Oswego as the seller of water, Tigard as the buyer. The Oregon Water Resources Department (OWRD) and the conservation community encourage regional water supply planning and collaboration among multiple communities as an efficient and environmentally responsible way to manage water needs.

This Alternatives Analysis presents the following:

- Project need;
- Project purpose;
- Water supply source alternatives evaluation criteria, description, and evaluation; and
- Proposed project design/location/alignment alternatives evaluation criteria, description, and evaluation.

2 PROJECT NEED

The cities of Lake Oswego and Tigard have grown in population since their incorporations in 1910 and 1961, respectively, and have increased demand for water even though they have implemented water conservation measures. Lake Oswego and Tigard have undeveloped land within their Metropolitan Area Boundaries (the "Urban Growth Boundary") that were established by the Metropolitan Government (Metro). Development of these lands will increase the demand for water. The elected officials and governments of Lake Oswego and Tigard are responsible for ensuring adequate, safe drinking water for current and future citizens, and that responsibility involves planning for, financing, and building infrastructure that supports the needed safe drinking water supply in a manner consistent with water rights permits and state and federal environmental law.

Major components of the City of Lake Oswego's water supply system, which was constructed in the late 1960s, are nearing the end of their ability to reliably meet the water demands of the city residents and wholesale customers. Key facilities need to operate with best utility and engineering practice. In addition, operations staff at the water treatment plant must exercise extraordinary care and diligence to ensure that treated water quality standards and goals are consistently achieved, regardless of incoming water quality. Despite conservation efforts and investments made in Lake Oswego's supply and treatment infrastructure to squeeze every bit of capacity and value from the more than 40-year-old system, renewal, replacement, and expansion of facilities must occur to reliably and economically meet this community's long-term needs for a safe drinking water supply.

The City of Tigard does not currently have an ownership position in a primary water supply source, and therefore has limited control over the availability and increasing cost of its water supply. Tigard currently obtains its water primarily through a contract with the City of Portland, and during peak use, in spite of significant conservation efforts, demand exceeds the contracted water allotment, and infrastructure capacity. Currently, Tigard can only obtain 5.9 MGD from the City of Portland using the existing connections. Additionally, purchase of water from the City of Portland is more costly and availability of water is not guaranteed. The City of Tigard seeks a partnership in a water supply system that can ensure access to an affordable, adequate, reliable, long-term supply of safe drinking water.

Both communities—Tigard and Lake Oswego—want to pool their resources, implement real multi-community regional water supply planning, and replace the historical approach of isolated city-by-city competition for water with a cooperative approach on a joint project that will endure for the benefit of both for many years to come. Such projects cannot and should not be limited to the current need, but must take into account future need based on Metro decisions on urban growth within the Urban Growth Boundary as well as realistic growth projections that, as is the case with Lake Oswego and Tigard, have been reviewed and found reasonable by the OWRD.

3 PROJECT PURPOSE

The project purpose is to upgrade, replace, and expand Lake Oswego's existing drinking water infrastructure to provide water to Lake Oswego and Tigard, to satisfy current demands and for the anticipated growth in demand forecast to occur over the 30-year planning horizon.

To ensure that the project purpose is achieved, the project must meet the following project objectives. Specifically, the project must:

- Be an ***adequate source*** of ***safe*** drinking water to supply the current and future demands of the citizens and wholesale customers of Lake Oswego and Tigard over the 30-year planning horizon;
- Be a ***reliable, long-term*** supply that satisfies the water demands of the cities for the 30-year planning horizon while acknowledging the many uncertainties inherent in long-term water supply planning (e.g., population growth rates, development patterns and density, changes in basin hydrology, local and national economic conditions, changes in environmental regulations, conservation, etc.);
- Be a supply source that is ***acceptable*** and ***supportable*** by the policy makers and the end water users within Lake Oswego and Tigard, including residents, businesses, and wholesale customers, in the context of a safe drinking water supply as well as for the protection of the natural environment of Oregon;
- Be an ***affordable*** source that makes an efficient use of public dollars spent as measured by the cost per gallon of water delivered over the planning horizon; and
- Be ***permitable***, ***constructible***, and ***operational*** (including a 12-month operational startup and testing period) by June 30, 2016 (the expiration date of Tigard's contract with the City of Portland).

4 WATER SUPPLY PLANNING

Water supply planning information relevant to the Lake Oswego Tigard Water Partnership is summarized in the following sections including forecasted future water demand, water rights and water conservation.

4.1 WATER DEMAND

The cities of Lake Oswego and Tigard will need a reliable, long-term supply that satisfies the water demands of the cities for the 30-year planning horizon. Demand forecasts were completed for both cities using population projections and historical per capita demand values. The future peak day demands were forecasted to be 24 million gallons per day (MGD) for Lake Oswego and 20 MGD for Tigard, for a total system peak day demand of 44 MGD (Brown and Caldwell, 2011).

4.2 WATER RIGHTS

The City of Tigard holds seven surface water rights for local irrigation purposes only. The City of Tigard does not solely hold any surface water rights that could be used for municipal water supply purposes.

In addition to its non-municipal surface water rights, the City of Tigard also holds five groundwater rights within the Tualatin River Basin that authorize a total use of up to 2.3 MGD for municipal purposes. These municipal groundwater rights are within the Cooper Mountain-Bull Mountain Critical Ground Water Area (CMBM CGWA). The CMBM CGWA order limits the total use of groundwater from the basalt aquifer within the CGWA and the City of Tigard must request that OWRD authorize use of a quantity of water each year.

The City of Tigard is also a member of the Willamette River Water Coalition (WRWC), which holds permit S-49240 for use of water from the Willamette River. The WRWC holds this water right permit and Tigard could have future access to this water right through a cooperative agreement with WRWC. Tigard does not currently have access to water under this permit because of the lack of public confidence in the Willamette River as a source and the excessive cost of treatment and delivery.

The City of Tigard has a limited license to operate its Aquifer Storage and Recovery (ASR) system as a supplemental supply source. By 2016, the ASR system would provide a supplemental capacity of 5.8 MGD that would be used during times of seasonal peak demand.

The City of Lake Oswego holds permits and certificates that authorize the use of surface water from the Clackamas and Willamette rivers as well as from three groundwater sources. The City of Lake Oswego holds two water right permits for the Clackamas River authorizing diversions of up to 38 MGD. Lake Oswego's senior water right of 32 MGD, with a priority date of March 14, 1967, has priority because it is senior to the instream water right located on the same stretch of river. This instream right has an August 26, 1968 priority date and preserves stream flow to support aquatic life. Lake Oswego also has a 6 MGD water right permit that is junior to the instream water right.

In 2001, Lake Oswego received a certificate for a "partial perfection" of its senior water right. By partially perfecting this water right, Lake Oswego proved that 16 MGD of water had been beneficially used in accordance with the permit conditions. Oregon water law allows permits to be incrementally perfected in amounts not less than 25 percent of the full permitted amount. Oregon water law also establishes a process by which municipal permit holders may seek additional time to fully develop their permits. Lake Oswego sought an extension of time to fully develop the remaining 22 MGD of its Clackamas River water rights permits. In 2007, the OWRD issued a Proposed Final Order to extend the permit until 2040, but the order was protested and went to a contested case hearing. The hearing before an administrative law judge concluded in March 2010. In a ruling issued August 2010, Judge Barber found that OWRD properly granted the extensions and conditioned the extended permits to maintain persistence of listed fish. In response to this ruling, OWRD issued a Final Order for the remaining 22 MGD. The Final Order stipulates conditions that must be followed in order to maintain the persistence of fish in the Lower Clackamas River. Those conditions are as follows:

a Minimum fish flow needs on the Lower Clackamas River as recommended by ODFW are presented in Table 1, below, and are to be measured at United States Geological Survey (USGS) Gage Number 14211010, Clackamas River near Oregon City, Oregon, or its equivalent.

b In cooperation with other members of the Clackamas River Water Providers[1] (CRWP), the City of Lake Oswego must have an annual meeting with ODFW to devise a strategy to maximize fishery benefits that can be derived from CRWP's Stored Water Agreement[2] with Portland General Electric (PGE) for the release of stored water from Timothy Lake. This is of particular significance when augmenting stream flow during the period of July 1 through November 30.

c From the first Monday in September through June 30, the maximum total amount of the undeveloped portion of the Permits S-32410 and S-37839 that can legally be diverted shall be reduced in proportion to the amount by which the flows shown in Table 1 are not met based on a seven-day rolling average of mean daily flows measured on the Clackamas River at USGS Gage Number 14211010, near Oregon City, Oregon, or its equivalent as demonstrated in the following examples.

Example 1:

On June 15, the last seven mean daily flows were 750, 725, 700, 650, 625, 600 and 575 cubic feet per second (cfs). The seven-day rolling average is 661 cfs. The maximum total amount of the undeveloped portion of the permit that could legally be diverted under this permit would not be reduced, because the seven-day average of mean daily flows is greater than the 650 target flow for June 15.

Example 2:

If on June 15, the average of the last seven mean daily flows was 578 cfs, then the target flows would be missed by 11 percent (100 - [(578/650)x 100)]). If the maximum total amount of the undeveloped portion of the permit that can legally be diverted under this permit is 10 cfs, then the maximum total amount of the undeveloped portion of the permit that could be legally diverted under this permit would be reduced by 11 percent. The maximum total amount of the undeveloped portion of the permit that could be legally diverted under the permit under this condition would be 8.9 cfs (10-[10 x 0.11] = 8.9).

---

[1] The Clackamas River Water Providers is an entity created pursuant to ORS 190 comprised of water providers on the Clackamas River that are working together on water resource issues. The purpose of the organization is to collectively fund and coordinate efforts regarding water resource planning and management, water conservation, and the development of the Clackamas River on a sustainable basis. Lake Oswego is a member of this group.

[2] PGE and the Clackamas River Water Providers have a Stored Water Agreement that allows the water providers the option to reserve water stored in Timothy Lake and call for that stored water to be released certain times of the year to maximize fishery benefits from any available releases. This agreement is the process of being revised and will be tied to the new PGE FERC license. The purpose of this agreement is to give the water providers more flexibility to manage for flow variations in the lower river.

Table 1. Minimum Fish Flow Needs on the Clackamas River

Table 1. Minimum Fish Flow Needs on the Clackamas River	
Month	Flow
June 1 – September 15	650 cfs
September 16 – May 31	800 cfs

State law requires cities to create Water Management and Conservation Plans (WMCPs) and to demonstrate use without waste before additional water may be diverted out of stream. Development of the Lake Oswego and Tigard WMCPs is discussed in the next section.

4.3 WATER CONSERVATION

The cities of Lake Oswego and Tigard continue to pursue water conservation programs. In 2007, the OWRD issued a Final Order approving a WMCP for the City of Lake Oswego. With formation of the partnership between the two cities, Lake Oswego developed an update to the WMCP in January 2010. This plan update has been reviewed, and OWRD issued a Proposed Final Order in August 2010. Issuance by OWRD of a Final Order for the WMCP is pending.

Although not required to do so by Oregon statute, the City of Tigard completed its Draft WMCP in March 2010. The Tigard Draft WMCP has been reviewed by OWRD and a Final Order approving Tigard's WMCP was issued on September, 23, 2011. Both cities' WMCPs build on the success of already robust water conservation programs and guide the development, financing, and implementation of ongoing and new programs and policies to ensure sustainable use of water resources while the cities plan for their future water needs. Also, the WMCPs establish a prioritized list of current and future conservation measures and practices to meet regulatory benchmarks and self-imposed performance targets, and they guide the cities' future investments in conservation programs.

Lake Oswego and Tigard will continue to utilize a suite of programs and practices to achieve their conservation objectives of water use without waste; however, both communities realize that conservation alone cannot eliminate the need for expansion of their water supply system. These ongoing conservation programs and practices include the following:

- Conservation pricing through use of tiered pricing structures;
- Toilet/urinal rebates (residential and commercial);
- High efficiency clothes washer rebates;
- Public education;
- Water audits for residential/commercial customers;
- Give-aways (hose nozzles, faucet aerators, hose timers, toilet tank bags, and dye tablets);
- Restaurant high efficiency spray rinse nozzles;
- Landscape sprinkler system rain sensors; and
- System-wide metering, leak detection, and meter testing and replacement.

5 ALTERNATIVES (WATER SUPPLY SOURCES)

The Project Sponsors acknowledge and accept responsibility for selecting a water supply alternative that achieves the project purpose and satisfies the public's interest in maintaining and enhancing the environmental functions and values of this state and, in particular, of the Clackamas River. The following sections of this memorandum identify evaluation criteria and use them to evaluate the efficacy of water supply source alternatives to achieve the project purpose in the least environmentally damaging way possible.

5.1 EVALUATION CRITERIA

The following evaluation criteria were used to determine the feasibility of the water supply source alternatives:

- **Adequacy –** The selected alternative must ensure an adequate source of safe drinking water to supply the current and future water demands of the citizens of Lake Oswego and Tigard over the 30-year planning horizon.
- **Reliability –** The selected alternative must be sufficiently reliable to eliminate unnecessary risk of loss or damage to the two communities' supply of safe drinking water. Reliability includes the concepts of redundancy and resiliency of access to a source of supply under the control of the water users.
- **Acceptability –** The selected alternative must be acceptable to the ultimate water consumers, the residents and businesses of the cities of Lake Oswego and Tigard. For purposes of this alternative evaluation, acceptability metrics include perceived health risks, associated water quality of a source, and avoidance of excessive adverse environmental impacts. Without the support of the end water consumer, an alternative is not viable because it would not be built and another alternative would be selected.
- **Affordability –** The selected alternative must be affordable for the citizens of Lake Oswego and Tigard in difficult economic times. The affordability of an alternative will be based on a net present value analysis of capital, and operating and maintenance costs over the period of analysis (30-year project planning horizon).
- **Permitability –** The selected alternative must avoid environmental impacts if possible, minimize impacts where avoidance is not possible, and mitigate any environmental impacts through careful planning and design. The permitability criterion will also evaluate the ability to secure all necessary permits so that the project can be operational for the one-year startup and testing period beginning in summer 2015.

5.2 ALTERNATIVES CONSIDERED

The following water supply source alternatives were considered for evaluation in meeting the project purpose:

- **No Action Alternative – Clackamas Supply and Alternate Sources:** Major repair, replacement, and renewal of existing Clackamas River supply infrastructure, continued conservation programs, and reliance on alternate sources to supply demands in excess of 16 MGD. Until June 2016, the City of Tigard would continue to get its water from Portland and Tigard's Aquifer Storage and Recovery (ASR) wells. This alternative would not meet the water needs of Lake Oswego or Tigard beyond June 2016 and therefore fails the adequacy criterion.

- **Full System Expansion – Clackamas Supply (Proposed Alternative):** Construct new and expand existing supply infrastructure to allow development of Lake Oswego's Clackamas River water rights up to 38 MGD.
- **Full System Expansion – Clackamas and Willamette River Supplies:** Major repair, replacement, and renewal of existing Clackamas River supply infrastructure to continue to deliver Lake Oswego's currently certificated portion of its Clackamas River water rights (16 MGD) and apply for a new permit to appropriate an additional 22 MGD of water from the Willamette River, for a total potential diversion of 38 MGD. This alternative requires construction of a new 22 MGD intake on the Willamette River.
- **Partial System Expansion of Clackamas Intake and Expansion to Portland Source Supply:** Construct new and replace the existing Clackamas River supply infrastructure to deliver up to 24 MGD to the City of Lake Oswego. To meet its future demand of 20 MGD, the City of Tigard would need to negotiate a new long-term water supply contract with the City of Portland, construct a new supply line, and continue to use its ASR wells.

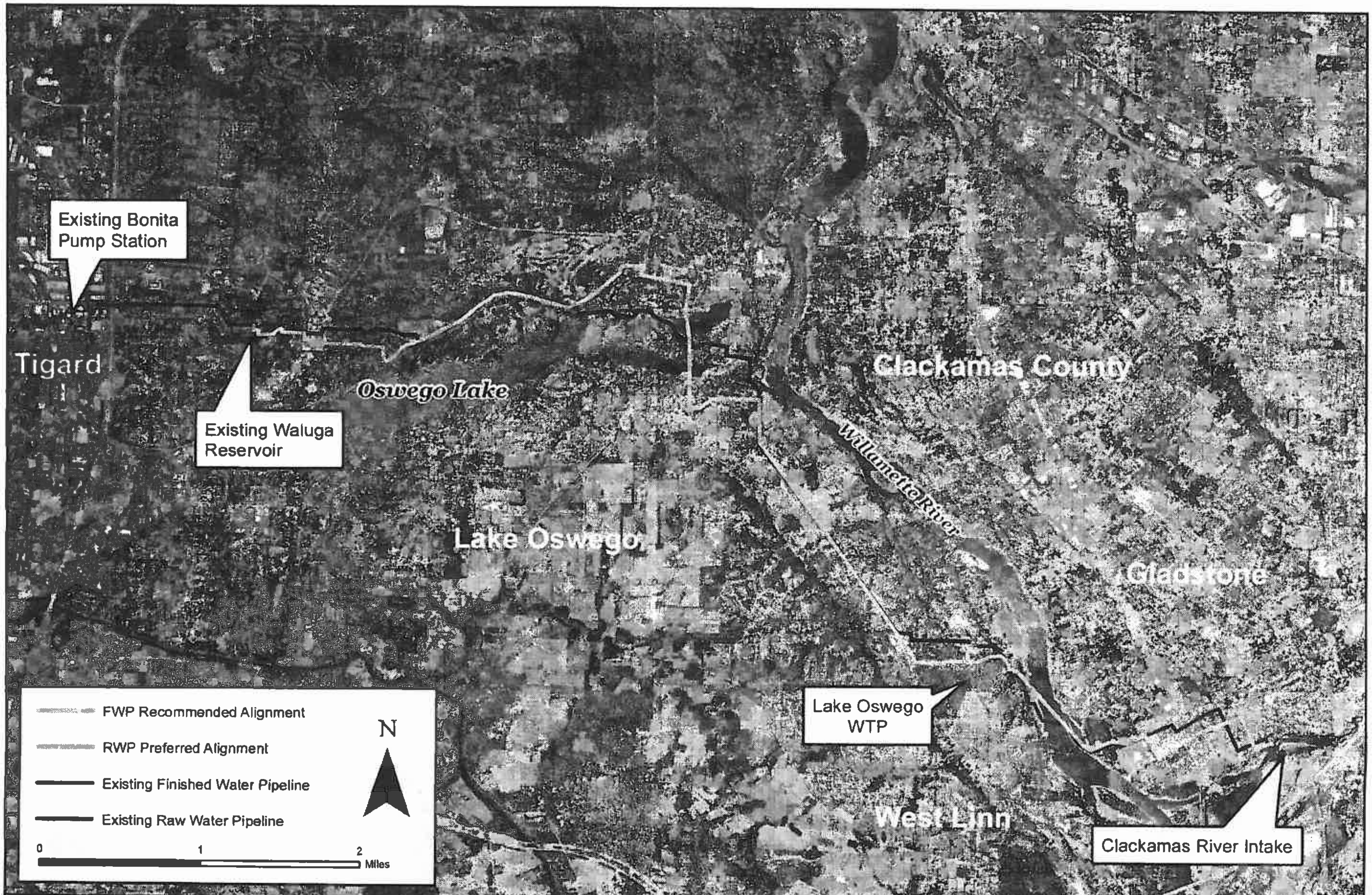
5.3 ALTERNATIVES ANALYSIS

The summary below describes the water supply source alternatives, evaluates the alternatives based on the project purpose and evaluation criteria, and provides the reasons for rejecting certain alternatives.

5.3.1 No Action Alternative

This alternative involves major repair, renewal, and replacement of existing Lake Oswego water supply system components (see Figure 1), and continuation and enhancement of water conservation programs within the Cities of Lake Oswego and Tigard. This alternative would not meet the demands of Lake Oswego or Tigard beyond June 2016 nor does it avoid impacts to the environment.

The City of Lake Oswego would need to upgrade and repair the existing River Intake Pump Station (RIPS), because its foundation is structurally unsound and the mechanical and electrical systems are becoming obsolete and unreliable, and the capacity is inadequate to meet future demands. Implementing repairs to correct these deficiencies would trigger requirements to meet current electrical and life/safety building codes and regulations that cannot be achieved within the current building envelope and structure. In addition, the Raw Water Pipeline (RWP) is more than 40 years old. Therefore, this alternative has many of the same capital costs and environmental impacts of the proposed project (see description below), including construction within the Clackamas River and along the RWP route (including the Willamette River crossing and associated riparian areas), without achieving the project purpose.



Lake Oswego · Tigard Water Partnership sharing water · connecting communities / Brown AND Caldwell	JPA Alternative Analysis	Lake Oswego Water Supply Facilities	Figure 1

The no action alternative would not meet Tigard's water demand beyond June 2016. Through June 2016, the City of Tigard would meet its average day demands of 6.4 MGD from Portland (current capacity of 6.8 MGD) and supplement its peak day demands of 13 MGD with the ASR wells (current capacity of 5.8 MGD).

Tigard's water needs are expected to increase to 20 MGD even with enhanced water conservation strategies, due to additional growth within Tigard's service area and future development of currently undeveloped lands. The no action alternative would not meet the project purpose for Tigard, because it does not meet the long-term water supply demand for Tigard for the following reasons:

- Tigard's ability to meet peak day demands from current sources of supply is near deficient.
- Portland's supply to Tigard is limited to 6.8 MGD and cannot be expanded without negotiating a long-term contract with Portland and investing in a new supply transmission system to Tigard from Portland.
- Further development of the ASR system could be attempted, but current hydrogeological information does not support successful expansion to this extent.
- The City of Portland source causes operational issues during winter refill of the Tigard ASR system. Tigard operations staff must closely monitor and manage the refill of the ASR system, having to halt refill with the Portland unfiltered source water during high turbidity periods. This results in a reduced reliability of refill of the ASR system and higher operational costs.

When evaluated against the five evaluation criteria noted above, the no action alternative was rejected because it failed to satisfy the project purpose, as follows:

- **Adequacy** – The no action alternative does not satisfy this criterion because it does not meet the long-term water supply needs of Lake Oswego and Tigard. It is not realistic to assume that both cities, for a second time in five years, would undertake a second set of costly engineering, financial, and intergovernmental studies in order to identify feasible alternative sources of water supply and that these alternative sources of supply could be developed on the same schedule as the proposed alternative. Both cities commissioned a comprehensive engineering and financial analysis of supply source alternatives in 2007, and this work resulted in a finding that the proposed alternative best meets the project purpose.
- **Reliability** – This alternative would not provide a long-term water supply for the City of Lake Oswego, because it fails to ensure a reliable supply of drinking water beyond the current demand of 16 MGD. The no action alternative is fatally flawed, because alternative sources of supply are not immediately available, and it would not be a timely process to secure appropriate intergovernmental agreements with other water suppliers. This alternative also fails to achieve the project purpose because it leaves the City of Tigard without a water source that is reliable into the future and presumes Tigard would have to secure water from other water suppliers, with no guarantee either that water would be available or that it could be purchased at a competitive cost after 2016.
- **Acceptability** – The no action alternative would not be acceptable to the end water users in either Lake Oswego or Tigard, because it would not meet future water supply demands of 24 MGD and 20 MGD, respectively. If the no action alternative were selected and implemented, there would be mandatory curtailment during the peak summer season to ensure demand is managed to the current "firm capacity" of 12 MGD. This would include curtailment of supplies to Tigard as well as other current wholesale customers of Lake Oswego.

- **Affordability** – The net present value cost for the no action alternative for the cities of Lake Oswego and Tigard was not developed, because the no action alternative would not meet the project purpose for either city.
- **Permitability** – The no action alternative would likely be permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented.

5.3.2 Full System Expansion – Clackamas Intake (Proposed Alternative)

The Full System Expansion – Clackamas Intake is the proposed alternative. This alternative would expand the current Lake Oswego and Tigard water supply facilities to accommodate the existing and future needs of both the City of Lake Oswego (24 MGD) and the City of Tigard (20 MGD), utilizing Lake Oswego's senior and junior water rights on the Clackamas River of 38 MGD. The City of Tigard will also use its ASR system as a supplemental supply source. The proposed ASR system would provide a supplemental capacity of 5.8 MGD that would be used during times of seasonal peak demand.

The proposed alternative is anticipated to include the following primary elements:

- New River Intake Pump Station (RIPS)
- New Raw Water Pipeline (RWP)
- Expansion and upgrades to the Water Treatment Plant (WTP)
- New Finished Water Pipeline (FWP)
- A second reservoir at the Waluga Reservoir Site to provide additional storage capacity (WR2)
- New Bonita Pump Station (BPS)

This alternative best satisfies the project purpose and objectives and:

- Implements improvements to Lake Oswego's existing RIPS, RWP, and WTP that would be necessary even without the project;
- Creates opportunities for new or upsized interconnections to other regional sources of supply, increasing reliability and providing a backup water source;
- There will be a negligible reduction in the water surface elevation in this reach of the Clackamas River due to the increased Lake Oswego – Tigard withdrawal from 16 MGD to 38 MGD (less than 1/10 of a foot during the 95 percentile exceedance flow);
- Is the lowest life-cycle cost option for the City of Lake Oswego and for the City of Tigard; and
- Assures the City of Tigard an ownership interest in supply facilities and a reliable long-term source of water.

When evaluated against the five evaluation criteria noted above, this alternative was selected because it best satisfies the project purpose, as follows:

- **Adequacy** – This alternative would meet the needs of the City of Lake Oswego and the City of Tigard for a safe drinking water supply based on anticipated current need and future growth for the 30-year planning horizon.

- **Reliability** – This alternative provides Tigard an ownership share in its water supply, and also provides the potential for redundancy through future access to alternative supply sources, if and when they are identified and determined feasible.
- **Acceptability** - This alternative meets the project purpose of providing access to an excellent source of high quality raw water and new infrastructure that replaces unreliable and obsolete facilities at the lowest net present value of all alternatives evaluated.
- **Affordability** – The 30-year Net Present Value (NPV) costs were developed for all of the water source alternatives, with the exception of the no action alternative. The Full Expansion Alternative - Clackamas Intake (proposed alternative) has the lowest 30-year NPV cost, by nearly $50 million, for both the City of Lake Oswego and the City of Tigard (see Table 2).

Table 2. Water Supply Source Alternatives: 30-year Net Present Value (NPV) Cost

Table 2. Water Supply Source Alternatives: 30-year Net Present Value (NPV) Cost			
Alternative	**Lake Oswego NPV Cost**	**Tigard NPV Cost**	**Combined NPV Cost**
No Action	N/A	N/A	N/A
Full Expansion – Clackamas R.	$168,000,000	$179,000,000	$347,000,000
Full Expansion – Willamette R.	$191,000,000	$205,000,000	$396,000,000
Partial Expansion	$243,000,000	$446,000,000	$689,000,000

- **Permitability** – This alternative would complete an existing permitted use of a high quality source of drinking water for Lake Oswego and Tigard that has long been contemplated by the original water rights permits acquired by Lake Oswego. The public's interest in further development of the City of Lake Oswego's water rights permits was recently tested using contemporary standards of review, and this alternative was found to uphold the highest and best use water policy of Oregon. As part of the water rights permit process, the Oregon Department of Fish and Wildlife (ODFW) advised the OWRD concerning the conditions that would allow Lake Oswego to meet its water supply needs while maintaining the persistence of listed fish species. ODFW's fish persistence advice for Lake Oswego's undeveloped water rights was based on the best available information and existing data and recommends the stream flows for maintaining the persistence of listed fish species. Based on these stipulated water withdrawal conditions in the Final Order for the water rights permit extension, this alternative would maintain the persistence of listed fish species and have negligible impact on water levels of the Clackamas River.

  This alternative is permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented, because it minimizes environmental impacts and can be completely operational by June 30, 2016.

5.3.3 Full System Expansion – Clackamas and Willamette Intakes

Under this alternative, major repair, replacement, and renewal of existing Clackamas River supply infrastructure would be required to continue to reliably deliver the City of Lake Oswego's certificated portion of its Clackamas River water rights (16 MGD). These improvements would be the same as those described in the no action alternative for Lake Oswego. To meet the demands of both cities, a new water right to divert an additional 22 MGD would be required for the Willamette

River. After a new water right permit is acquired, the cities would construct a new 22 MGD RIPS on the west bank of the Willamette River at a point of diversion that is not yet known.

When evaluated against the criteria noted above, the Clackamas and Willamette Intakes alternative was rejected, because it failed to satisfy the project purpose, as follows:

- **Adequacy** – Subject to acquisition of a new permit to divert 22 MGD from the Willamette River, acquisition of state-owned property to site a new 22 MGD intake on the west bank of the Willamette River, and public acceptance, this alternative could provide an adequate supply of raw water for treatment and supply to citizens of Lake Oswego and Tigard and their respective wholesale customers.
- **Reliability** – This alternative could provide a reliable source of water for both cities.
- **Acceptability** – This alternative would be rejected by the citizens of both Lake Oswego and Tigard. Lake Oswego currently enjoys and has long-standing water rights to drinking water from the Clackamas River, an excellent source of high quality water. It is highly likely that Lake Oswego residents would reject receiving a portion of their water supply from the Willamette River. The City of Tigard currently has a co-owned water right on the Willamette River; however, Section 51 of Tigard's City Charter includes a restriction established by a vote of the citizens in 1999 that prohibits use of the Willamette as a source of drinking water without a city-wide vote. Moreover, the necessary new development on the banks of the Willamette River would not be seen as an appropriate and necessary environmental impact by the citizens of both communities.
- **Affordability** – The 30-year NPV cost for this alternative was almost $50 million more than the 30-year NPV cost for the proposed alternative (see Table 2).

  Additional costs for this alternative would result from:

  - Land acquisition costs for a new intake structure;
  - Costs associated with land use approvals for a new intake structure;
  - Costs associated with water rights permit acquisition;
  - Lost revenue from wholesale customers choosing to terminate existing agreements with Lake Oswego and Tigard due to negative public perception related to the Willamette River;
  - Costs to Tigard associated with a multi-year extension of water purchase agreements with the City of Portland until this option could be approved and constructed; and
  - Costs associated with attempting to overcome negative public reaction to developing the Willamette River for a drinking water supply (e.g., delays for studies and debates and use of more expensive treatment technology to address perceived public health risks from this water source).
- **Permitability** – This alternative would not avoid any of the environmental impacts of the proposed alternative but would increase environmental impacts by introducing a new water withdrawal and installing a new intake facility on the west bank of the Willamette River. Additional water rights would need to be acquired for the Willamette River. The administrative process required to acquire a permit for diverting waters of the State takes a substantial amount of time, and there is no certainty of approval. To undertake this effort now would impose significant schedule and cost risk to the Project Sponsors and would most certainly delay the project past the expiration of Tigard's water contract with the City of Portland in 2016.

Additionally, land would need to be acquired from the State of Oregon in order to site a new RIPS. If the Willamette RIPS facility is sited in Mary S. Young Park, an Oregon State Park operated by the City of West Linn, the type of facility would violate certain land use restrictions. In order to mitigate the use of park property for construction of the new Willamette RIPS, land would also need to be acquired to replace the acquired park parcel with an equivalent parcel for park purposes.

5.3.4 Partial System Expansion of Clackamas Intake, and Contract and Expand Portland Source

This "go it alone" alternative would include partial expansion of the existing Clackamas River supply infrastructure to meet Lake Oswego's 24 MGD demand and the negotiation of a long-term water supply contract with the City of Portland to meet Tigard's demand of 20 MGD. It should be noted that this alternative does not support a move toward regional water supply planning because Lake Oswego and Tigard would not be working together for their long-term water supplies.

The City of Lake Oswego would construct a new RIPS on the Clackamas River, a raw water pipeline, a treatment plant, and a finished water pipeline and reservoir, with an ultimate build-out capacity of 24 MGD. This alternative would fulfill the City of Lake Oswego's projected supply needs; however, this is Lake Oswego's most expensive alternative, because none of the capital or long-term operations and maintenance costs would be shared with Tigard.

The City of Tigard would be required to obtain its municipal water supply from other sources, the most likely of which is the City of Portland. Tigard's water needs are expected to increase to 20 MGD even with the water conservation strategies in place and planned for the future. The City of Tigard would need to negotiate a long-term water supply contract with the City of Portland and construct a new supply line and associated pumping system improvements. At a minimum, the new supply line would be approximately 11 miles long and run between Willamette Park and Tigard's 10 million gallon terminal reservoir. Tigard would also continue to use its ASR system for peak day seasonal demand. As discussed in the No Action alternative, the City of Portland source would cause operational issues during winter refill of the Tigard ASR system. Tigard operations staff would need to closely monitor and manage the refill of the ASR system, having to halt refill with the Portland unfiltered source water during high turbidity periods. This would result in reduced reliability of refill of the ASR system and higher operational costs.

When evaluated against the criteria, this alternative was rejected because it does not achieve the project purpose, as follows:

- **Adequacy** – While this alternative could provide Lake Oswego and Tigard with an adequate supply of drinking water, it does not support regional water supply planning and development on a multi-community basis.
- **Affordability** – This is both cities' most expensive alternative, with the 30-year NPV cost being almost twice that of the proposed alternative (Table 1). The NPV cost for this alternative includes partial expansion and operation of the Lake Oswego water supply facilities, construction of the new Portland supply line and associated pumping system improvement, and projected water rates that Tigard would pay to the City of Portland. The projected Tigard water rates are based on the Portland Water Bureau's Fiscal Year 2011-12 Five-Year Preliminary Financial Plan dated January 2011.

- **Acceptability** – Beyond affordability, this alternative could meet the desire of the citizens of the two communities for a high quality water source, since it does not rely on the Willamette River. However, it may be seen as unacceptable to the citizens of Lake Oswego because it jeopardizes the further development of Lake Oswego's remaining undeveloped water rights beyond 24 MGD. It would be unacceptable to the citizens of Tigard because it forces those citizens to continue purchasing water on a contract basis and therefore not achieve control over future costs. Additionally, this alternative would not fulfill a regional regulatory agency desire to move toward regional water supply planning.
- **Reliability** – Although this alternative would be reliable for the City of Lake Oswego, it would mean that Tigard would continue to purchase water from Portland or other suppliers, with no guarantee that the water would be supplied at a cost equivalent to the proposed alternative or at all.
- **Permitability** – This alternative would likely be permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented.

6 ALTERNATIVES (PROJECT DESIGN/LOCATION/ ALIGNMENT)

The river intake design and location, and pipeline alignments for the proposed project will be developed to avoid, where possible, and otherwise minimize impacts to fisheries, waterways, and wetlands. The proposed project's fishery, waterway, and wetland impacts occur at the RIPS, the RWP, and the FWP. No fishery, waterway, or wetland impacts are anticipated at the water treatment plant or the WR2. The intake design and location and pipeline alignments of the alternatives were the focus of alternative evaluations and impact avoidance strategies.

6.1 EVALUATION CRITERIA

The following evaluation criteria were used to determine the feasibility of alternative intake designs and locations and the alternative pipeline alignments:

- **Acceptability** – The selected intake design and location and the pipeline alignments not only must be acceptable to the ultimate water consumers but also must provide the least amount of disturbance to the communities where the intake and pipelines are being constructed.
- **Affordability** – The selected alternative must be affordable for the citizens of Lake Oswego and Tigard. The affordability of an alternative will be based on a comparison of NPV costs for both capital and operating and maintenance costs over the 30-year period of analysis.
- **Permitability** – The selected intake designs and locations and pipeline alignments must avoid environmental impacts if possible, minimize them where avoidance is not possible, and mitigate them through careful planning and design, and through the various permitting processes, secure all necessary permits so that the project can be operational for the one-year startup and testing period beginning in summer 2015.

The evaluation criteria of adequacy and reliability were not used to evaluate design, location, or alignment alternatives, because those two evaluation criteria pertain specifically to the feasibility of the alternative water supply sources. Design, location, and alignment alternatives were considered only for the proposed alternative—Full System Expansion – Clackamas Intake.

6.2 ALTERNATIVES CONSIDERED

The following alternatives were also considered for evaluation in meeting the project purpose:

- Evaluation of alternative intake locations and intake screening designs;
- Evaluation of open excavation versus trenchless construction for major water body crossings; and
- Evaluation of constructing around versus through wetlands.

6.3 RIPS LOCATION ALTERNATIVES ANALYSIS

The existing RIPS facility draws raw water from the Clackamas River and pumps it to the Lake Oswego WTP for treatment. The proposed RIPS facility design would accommodate the combined senior and junior water rights of 38 MGD. Alternative intake locations were the focus of the evaluations and impact avoidance strategies. The existing RIPS is located at River Mile 0.8 on the right bank of the Clackamas River. The existing site and other locations both upstream and downstream were evaluated to determine the most favorable location for the new RIPS. The six locations identified for evaluation are shown in Figure 2. The key factors considered in the development of the alternative locations for the RIPS were the following:

- Water quality issues;
- Location (point of withdrawal) of existing water rights;
- Riverbed/riverbank stability;
- River bathymetry relative to proper pump submergence;
- Operations and maintenance (O&M) access;
- Fish considerations, including sweeping velocity and permitting;
- Utility access;
- Potential for issues related to river debris;
- Constructability;
- Location relative to 100 year floodplain;
- Access bridge length;
- Access road pipe alignment;
- Impediments to Clackamas River recreation; and
- Land use and property ownership.

6.3.1 RIPS Downstream Alternatives (Sites 1, 2, and 3)

Sites 1 and 2 are undesirable because of potentially unstable river conditions, potentially lower water quality, difficult utility access, exposure to large debris in the river, and the impact on recreational activity on the river.

A potential water quality concern for the downstream alternatives (Sites 1 and 2) is the influence from the Rossman Landfill and nearby upstream storm drainage discharges.


Clackamas River
Existing Raw Water Intake
Tri-Cities WPCP
(Outfall to Willamette River)
Rossman Landfill
Future Cove Development
Clackamette Cove
Portland Avenue
Beatrice Avenue
Intake Site Alternatives
Existing 27" Raw Water Main
City of Lake Oswego Property
Taxlots
0
450
900
Feet
N
Lake Oswego · Tigard Water Partnership
Brown AND Caldwell
JPA Alternative Analysis
River Intake Pump Station Site Alternatives
Figure 2

The Rossman Landfill is located just south of the Tri-City Water Pollution Control Plant on the south side of the Clackamas River, upstream of potential intake Sites 1 and 2 and the Clackamette Cove, which is located on the south side of the Clackamas River, downstream of the existing RIPS and upstream of the Highway 99E Bridge. The remedial action plan for the Rossman Landfill was designed so that the leachate from the landfill would not result in any exceedance of drinking water maximum contaminant levels (MCLs) in the Clackamette Cove, as discussed in *Remedial Action Work Plan: Unpermitted Rossman Landfill* report completed by URS Corporation in 2000. However, another study would need to be completed to confirm that water quality in the Clackamas River is not affected by landfill leachate at the downstream sites being considered.

Storm drain and combined sewer outfalls also pose a water quality concern for the downstream sites. A 54-inch-diameter storm drain outfall is located just upstream of the potential downstream sites. Water quality is not monitored at this outfall. Data from other outfalls in the area are available and indicate that constituents typical of storm drainage are discharged to the Clackamas River upstream of potential intake sites 1 and 2.

Site 3 was removed from consideration due to difficult construction access and the need to purchase adjoining residential property and existing homes to accommodate construction and permanent access.

6.3.2 RIPS Upstream Alternatives (Sites 5 and 6)

The upstream Sites 5 and 6 were found undesirable because of poor intake pool characteristics, difficult crane access for maintenance activities, exposure to debris in the river, and long access bridge length. These upstream sites are also located adjacent to City of Gladstone public park lands that are zoned for open space use, which would make it difficult to obtain property easements or acquisitions for a new RIPS facility. For these reasons, Sites 5 and 6 were removed from further consideration.

6.3.3 RIPS Existing Site (Site 4)

The existing site was found to be most favorable with respect to the evaluation criteria. The water rights are located at this point of diversion and moving the RIPS to another more distant location would require moving the point of diversion. The river pool at this location is sufficiently deep and has stable geophysical conditions, as evidenced by its 41-year history for the existing intake. A challenge with the existing site is fish screen sweeping velocity. The existing intake and associated fish screen are located away from the main river current in a backwater area, which currently results in eddy currents and upstream flow velocity at low river levels. In order to maintain future fish screen downstream sweeping velocity that is greater than the approach velocity and optimally between 0.8 and 3.0 feet per second (fps) (National Marine Fisheries Service guideline) for the proposed RIPS at this location, either the use of mechanically-induced sweeping velocity or redirection of the river current across the front of the intake via upstream channeling changes may be required.

6.3.4 Site Evaluation and Selection

While considering the attributes of the sites as described above, the sites were evaluated using the criteria. The existing site (Site 4) rated most favorable with respect to the criteria and was selected for the new RIPS location. The evaluation of the sites according to the criteria was as follows:

- **Acceptability** – Influence from the existing Rossman Landfill and nearby upstream storm drains is a potential water quality concern for the downstream Sites 1 and 2. The upstream Sites 5 and 6 were determined to be undesirable due to poor intake pool characteristics, difficulty of access for maintenance activities, exposure to debris in the river, long access distances from the river bank, and land use issues.
- **Affordability** – Site 3 was removed from consideration because of difficult construction access and the need to purchase adjoining residential property and existing homes to accommodate construction and permanent access. Sites 1, 2, 3, 5, and 6 would be more costly than Site 4 as a result of land acquisition needs and more challenging site conditions.
- **Permitability** – Sites 5 and 6 would move the intake upstream, which in turn would require the existing water right point of diversion to be moved. This would require additional water rights permitting for Sites 5 and 6, delaying the operational date of the project well beyond 2016. Sites 1, 2, 3, and 4 could secure all necessary permits so that the project can be operational for the one-year startup and testing period beginning in summer 2015.

6.4 INTAKE SCREEN ALTERNATIVES ANALYSIS

Design of the intake included selecting screens and screen cleaning systems with features to address the design criteria and guidelines of the fisheries agencies. Screen alternatives were evaluated based upon the NMFS Anadromous Salmonid Passage Facility Design guidelines, July 2011; the primary criteria for intake fish screen design are the following:

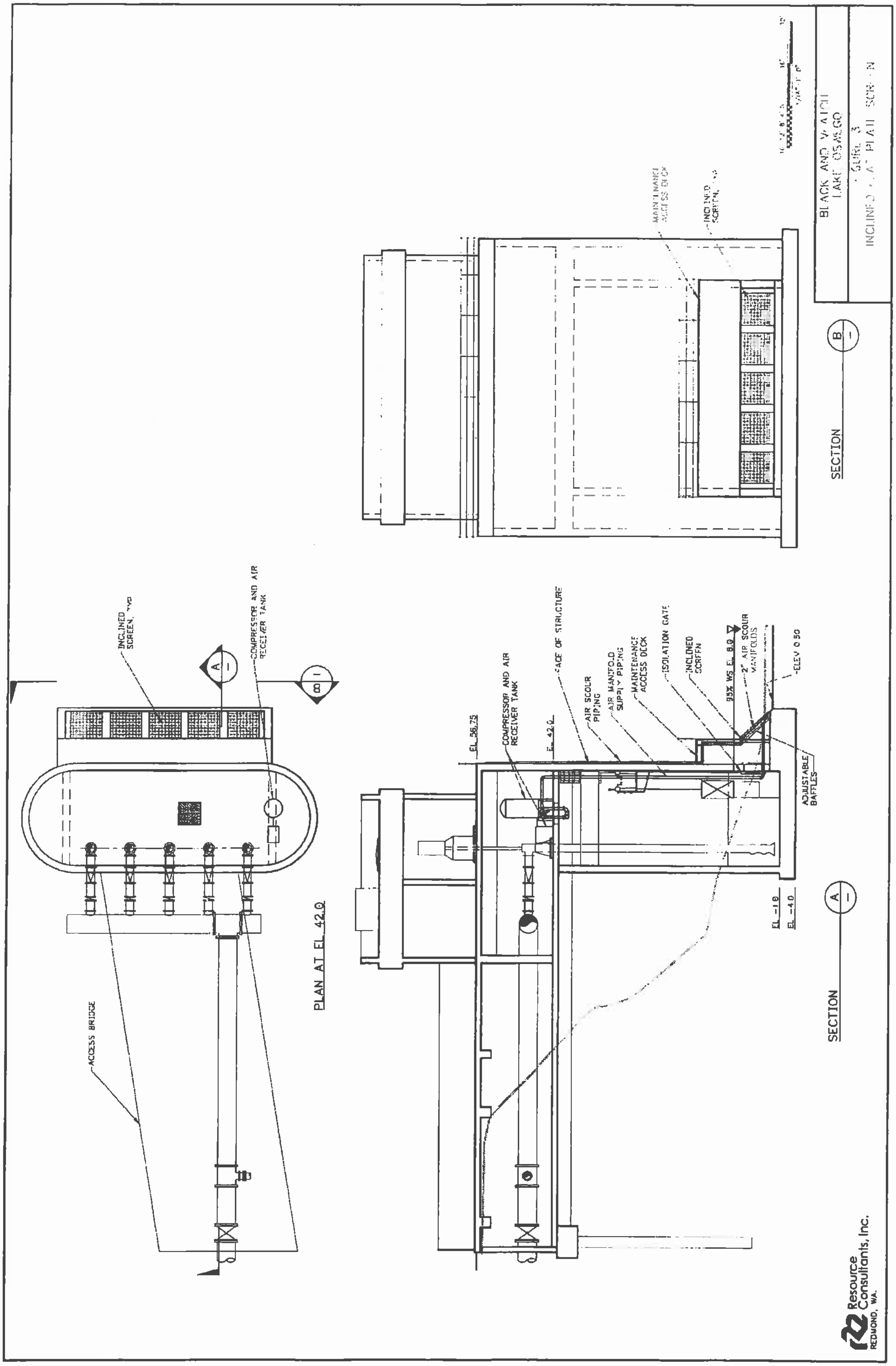
- Maximum screen approach velocity of 0.4 feet per second (fps);
- Open space between bars should be 1.75 millimeters or less;
- Sweeping velocity, the water velocity across the screen, greater than approach velocity and optimally between 0.8 and 3.0 fps; and
- Automatic screen cleaning system to clean the screens on detection of headloss across the screens and on an automatic, timed cycle with the ability for complete debris removal at least every 5 minutes.

6.4.1 Preliminary Intake Screen Alternatives Considered

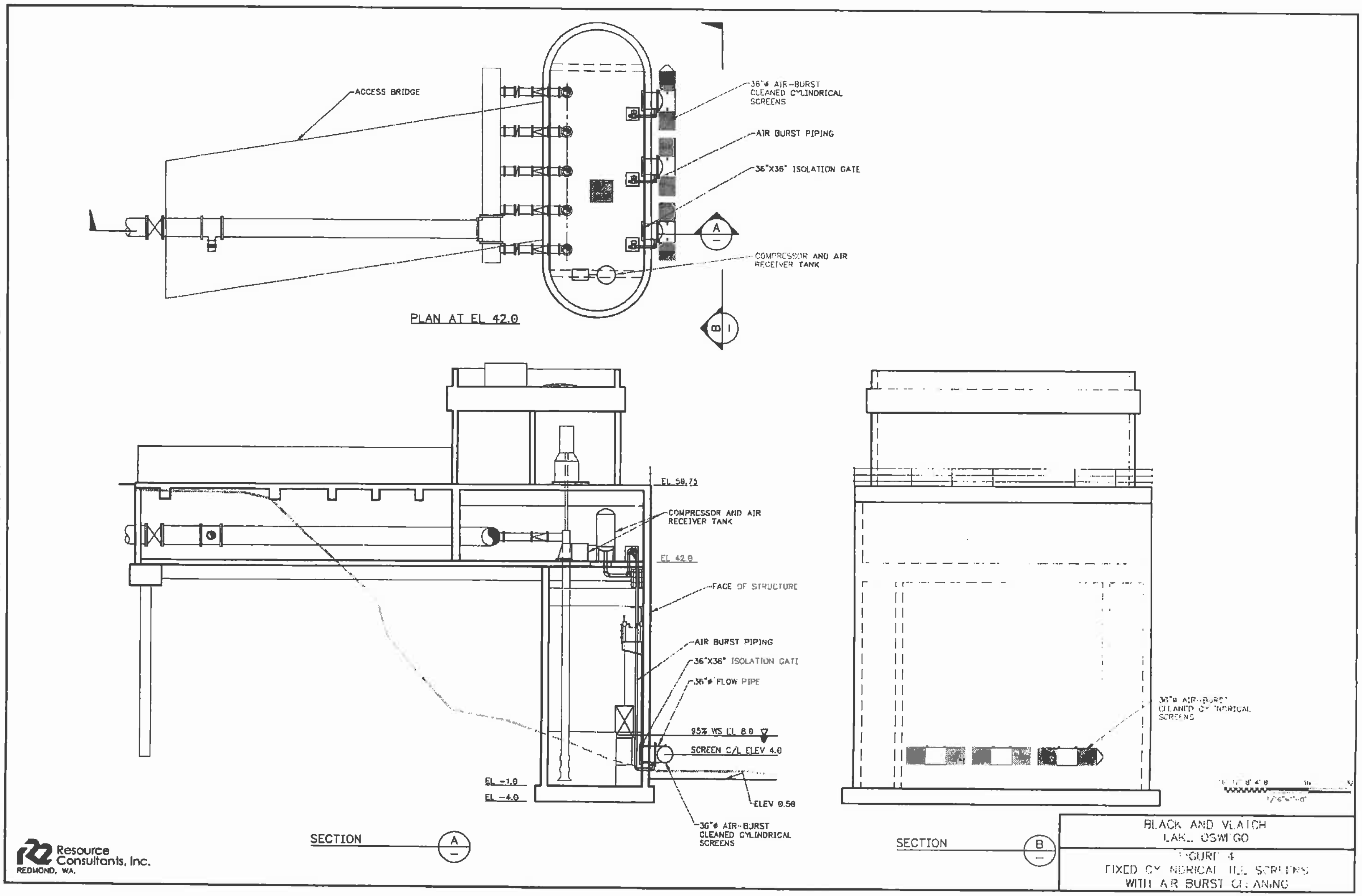
The following intake screens were initially considered for use at the new RIPS:

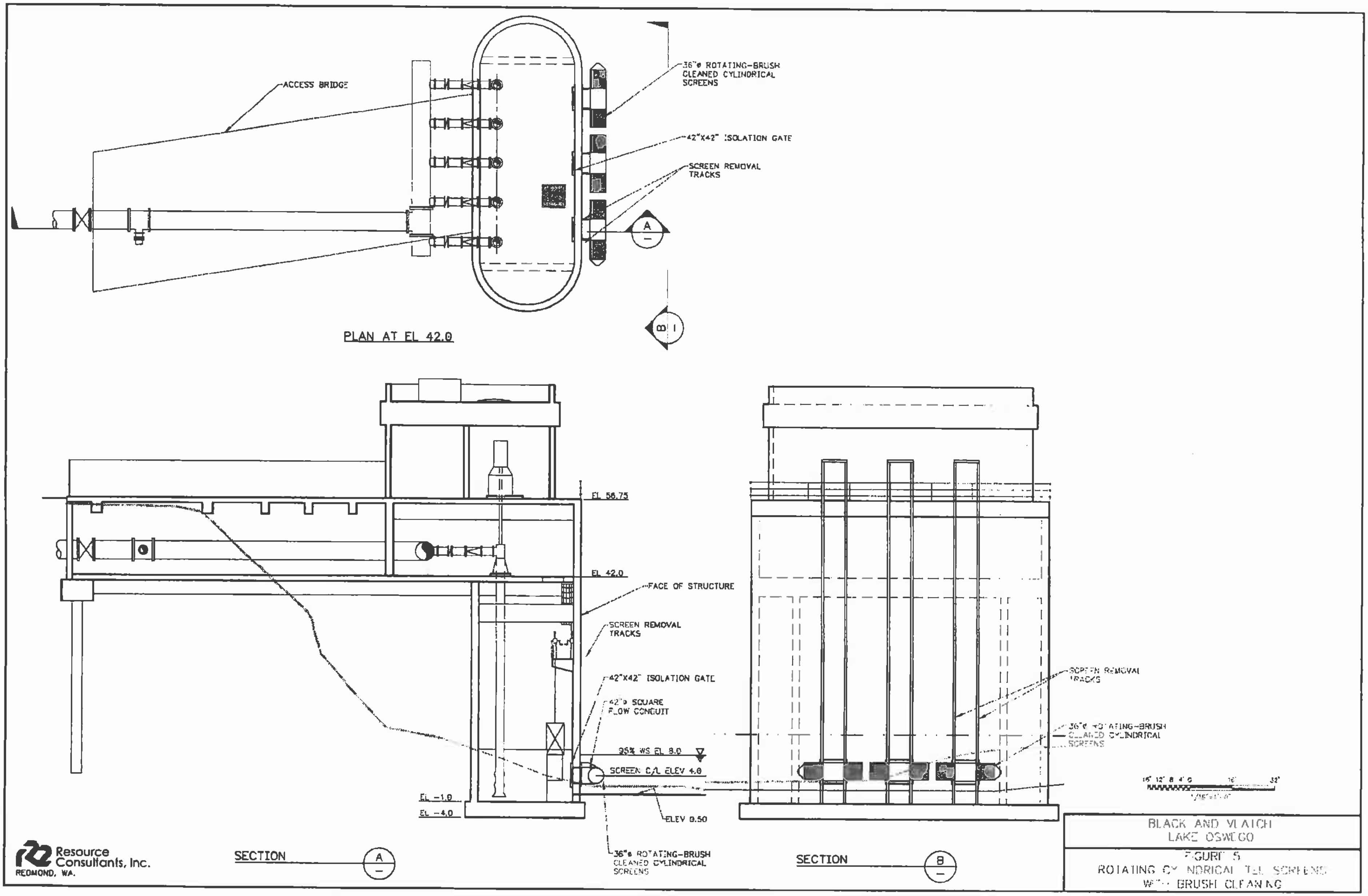
- Fixed vertical plate screens with water-jet cleaning;
- Fixed inclined plate screens with water-jet cleaning;
- Cylindrical fixed tee screens;
- Rotating cylindrical tee screens;
- Fixed cone screens;
- Vertical traveling screens; and
- Horizontal bar or plate screens.

The preliminary evaluation considered site-specific conditions, agency guidelines, constraints, and review of similar intakes on the Clackamas River. Fixed inclined plate screens, cylindrical fixed tee screens and rotating cylindrical tee screens were selected for further evaluation. Fixed cone screens were rejected because they offer no advantage over cylindrical fixed tee screens for this application.



INCLINED SCREEN, TYP
COMPRESSOR AND AIR RECEIVER TANK
ACCESS BRIDGE
PLAN AT EL 42.0
EL 56.75
EL 42.0
FACE OF STRUCTURE
AIR SCOUR PIPING
AIR MANIFOLD SUPPLY PIPING
MAINTENANCE ACCESS DECK
ISOLATION GATE
INCLINED SCREEN
95% WS EL 8.0
2" AIR SCOUR MANIFOLDS
ELEV 0.50
ADJUSTABLE BAFFLES
EL -1.0
EL -4.0
SECTION
SECTION
Resource Consultants, Inc.
REDMOND, WA.


ACCESS BRIDGE
36"ø AIR-BURST CLEANED CYLINDRICAL SCREENS
AIR BURST PIPING
36"X36" ISOLATION GATE
COMPRESSOR AND AIR RECEIVER TANK
PLAN AT EL 42.0
EL 58.75
COMPRESSOR AND AIR RECEIVER TANK
EL 42.0
FACE OF STRUCTURE
AIR BURST PIPING
36"X36" ISOLATION GATE
36"ø FLOW PIPE
95% WS EL 8.0
SCREEN C/L ELEV 4.0
EL -1.0
EL -4.0
ELEV 0.50
36"ø AIR-BURST CLEANED CYLINDRICAL SCREENS
SECTION A
SECTION B
Resource Consultants, Inc.
REDMOND, WA.
BLACK AND VEATCH
LAKE OSWEGO
FIGURE 4
FIXED CYLINDRICAL TEE SCREENS
WITH AIR BURST CLEANING


ACCESS BRIDGE
36"ø ROTATING-BRUSH CLEANED CYLINDRICAL SCREENS
42"X42" ISOLATION GATE
SCREEN REMOVAL TRACKS
PLAN AT EL 42.0
EL 56.75
EL 42.0
FACE OF STRUCTURE
SCREEN REMOVAL TRACKS
42"X42" ISOLATION GATE
42"ø SQUARE FLOW CONDUIT
95% WS EL 8.0
SCREEN C/L ELEV 4.0
EL -1.0
EL -4.0
ELEV 0.50
36"ø ROTATING-BRUSH CLEANED CYLINDRICAL SCREENS
SECTION A
SECTION B
Resource Consultants, Inc.
REDMOND, WA.
LAKE OSWEGO
BRUSH CLEANING

The cylindrical screens would be positioned with the screens away from any local hydraulic impacts from the side wall of the structure, and place the screens out into a better river flow sweeping velocity. The layout places the screens 18 inches clear off the face of the intake structure. No lower access deck would be required with the tee screens because the cylindrical shape of the screens do not lend themselves to manual cleaning from above, and the baffling and air burst piping are both internal to the screen drums and do not need adjustment.

The major advantages of this alternative over inclined flat plate screen alternative, in addition to the reduced cost, are the location of the screens away from the face of the structure, the potential for improved cleaning over an air scour system, and the relative simplicity of the cleaning system. The air burst system in a tee screen takes advantage of the confined, remote nature of the screen drum, as opposed to a flat screen integrally connected to the pump chamber, and fills the screen drum with 2 to 3 times the screen drum volume with pressurized air over a period of 3 to 4 seconds. This violent discharge of air through the screen dislodges debris impinged on the screen. The three screens are cleaned sequentially, from upstream to downstream, so that debris from an upstream screen will not accumulate for a prolonged period of time on a downstream screen. Even so, an air burst cleaning may be less than completely effective at dislodging items actually attached to the screen such as heavy algae accumulation, although likely more effective than the air scour system. This is because the air cleaning does not mechanically brush or scrape debris off the screen.

Disadvantages of the air burst tee screen include the inability to access the screens for maintenance or inspection without divers (including any physical removal of algae mats), the potential for boats to impact the screens during periods of low water level, and potential danger to boats or people in the water in the vicinity of the screens during a burst cleaning. The violent discharge of air from the tee screen during a cleaning cycle can capsize or even sink a boat if it is too close to the screen. It is advised that this alternative include some form of physical restriction or cautionary signage to boats in the near vicinity of the RIPS.

Air burst tee screens are fabricated by the Hendrick Screen Company and other manufacturers and are in use at numerous facilities around the country. The screens have been approved by NMFS for use on pump stations, and other small magnitude flow diversions, for the protection of fish and are referred to as end-of-pipe screens in the NMFS Anadromous Salmonid Passage Facility Design guidelines issued in July 2011. In fact, air burst tee screens are currently in use for fish protection on the Clackamas River. Three tee screens are located on the pumped attraction water intake for the fish ladder at River Mill Dam in Estacada, and a tee screen is located on the Clackamas River Water intake in Clackamas.

6.4.2.3 Rotating Cylindrical Tee Screens with Brush Cleaning

The brush cleaned rotating cylindrical tee screen, shown on Figure 5, is an alternative that offers some distinct advantages over both of the fixed inclined flat plate screen and the fixed cylindrical tee screen with air burst cleaning. Perhaps most significant is the physical removal of debris from the screen, even adhered material such as algae. Of all available means of cleaning screens, physically brushing the screen is the most effective means of removing accumulations of algae. The general arrangement of the RIPS structure and the brush cleaned tee screens is identical to that described for the air burst cylindrical tee screens with three significant differences.

First, rather than an air compressor, receiving tank, air distribution controls, and a series of air pipes running down to the tee screens a submersible motor is located inside the central manifold of each tee screen. Second, the brush-cleaned tee screens are designed to discharge into a larger rectangular central discharge conduit resulting in lower velocity flow entering the pump station. Finally, each tee screen is mounted on tracks so that they can be individually raised up to the level of the upper deck for maintenance and inspection, eliminating the need for divers. The brush-cleaned tee screens are manufactured by Intake Screens, Inc. (ISI), and the installation with tracks for removing and installing the screens is their standard design. Although it may be possible to design an air burst tee screen mounted on tracks, Hendrick Screen Company has never done this so it would have to be a custom design and would likely add significant cost and some level of complication to the design.

The ISI tee screens have a fixed strip brush on the outside of the drum and a rotating cylindrical brush on the inside. When a cleaning cycle is called for the screen drum is rotated past the brushes several turns in both clockwise and counterclockwise directions, effectively removing debris, and more significantly algae, from both sides of the screen. In the case of algae, the mechanical action of brushing the screen face has the added benefit of breaking up some of the algae into small enough pieces that they simply pass through the screen in the pump flow and are eliminated from the potential for future re-accumulation on the screen or downstream screens. The brush cleaning also has the advantage of the potential for near continuous cleaning (well below a 5 minute cycle) if conditions require. Air cleaning typically is limited to bursts on a cycle of 15 to 30 minutes.

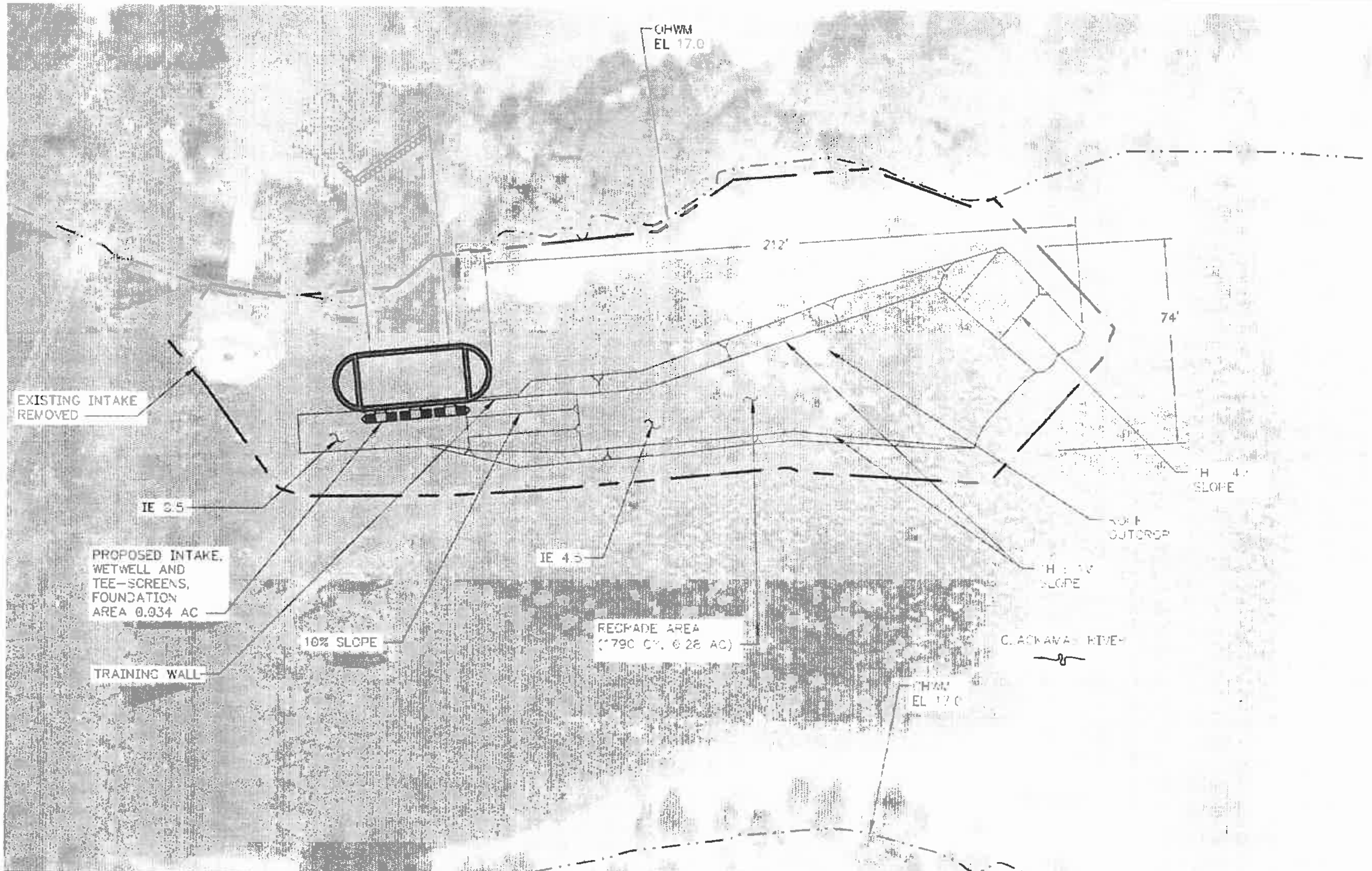
This alternative does have a significantly higher initial cost, mostly due to the track assembly for raising and lowering the screens, but the advantages of providing the most effective cleaning system and the ability to do inspections and maintenance in the dry may outweigh the higher initial cost over time.

6.4.3 River Channel Modifications to Improve Sweeping Velocity at the Intake

Under current conditions an eddy occurs at the intake resulting in poor sweeping velocity across the intake fish screens. To improve flow conditions across the screens a channel would be excavated parallel to the river bank upstream of the intake screens. The proposed channel, shown on Figure 6, will require excavation of approximately 1500 cubic yards of rock. The rock would be removed to create a strait upstream of the screens that would breach the rock outcrop and funnel the flow toward the screens. This strait is wider at the upstream end and maintains a constant elevation of 4.5 at the invert until it approaches the intake structure. Near the structure the invert slopes down at a 10% slope to an elevation of 0.5 feet below the screens. The channel walls are typically at a 1 foot horizontal to 1 foot vertical slope. A training wall is included just upstream of the intake on the right side of the channel to transition to the vertical intake wall. This wall has a top elevation of 10.0 feet. The upstream end of the channel transitions into the river bank at a 4 foot horizontal to 1 foot vertical slope.

The configuration of this channel results in a submerged ridge of rock between the proposed channel and the existing thalweg of the river. This ridge tends to direct the flow entering at the upstream end toward the screens and improve the sweeping velocity across the screens. This ridge also leaves a raised area to place gravel bags for cofferdams for isolating the area during construction.

With this channel configuration the sweeping velocity at the screen is estimated at 0.5 fps for the 95 percent exceedance condition for river flow. This sweeping velocity exceeds the approach velocity of the screen. Sweeping velocity is a particular concern when juvenile fish are present. The juvenile fish out migration period tends to peak from April to June. During this time frame the 95% exceedance flow is between 1000 and 2000 cfs. The area in the vicinity of the intake is scoured rock



NGVD29

NOTE: IE = INVERT ELEVATION

OVERALL SITE PLAN

NORTH

PRELIMINARY - NOT FOR CONSTRUCTION

WARNING

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

BLACK & VEATCH
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LOTWP
RIPS
JPA ALTERNATIVE ANALYSIS
SITE PLAN - RIPS AND CHANNELIZATION

FIGURE 6

0

and offers poor juvenile fish rearing conditions and it is unlikely that significant numbers of juvenile fish will be present near the screen during period other than the juvenile out migration. A design approach velocity of 0.3 fps is proposed to; insure compliance when using fixed baffled screens, better protect fish, better avoid debris clogging on the screens, and insure that the sweeping velocity will exceed the approach velocity. By removing rock upstream of the screen near to the right bank, a sweeping velocity of at least 1.0 fps can be achieved during the juvenile fish out migration season. The configuration of the screens adjacent to a large pool in the river results in conditions that allow fish ample freedom of movement around the screens by not confining fish in a structure close to the screens and avoiding the need for a fish bypass.

The proposed rock removal to create the channel near the right bank will greatly benefit sweeping conditions at the intake, and achieve sweeping velocity that equals or exceeds the approach velocity at the proposed screens under all low flow conditions. The individual screen lengths are relatively short and fish are not confined near the screens during operation. Providing consistent downstream sweeping velocity, as opposed to an upstream eddy flow, should be adequate to move fish downstream and away from the screens.

6.4.4 Intake Screen Arrangements Considered During Pre-Design

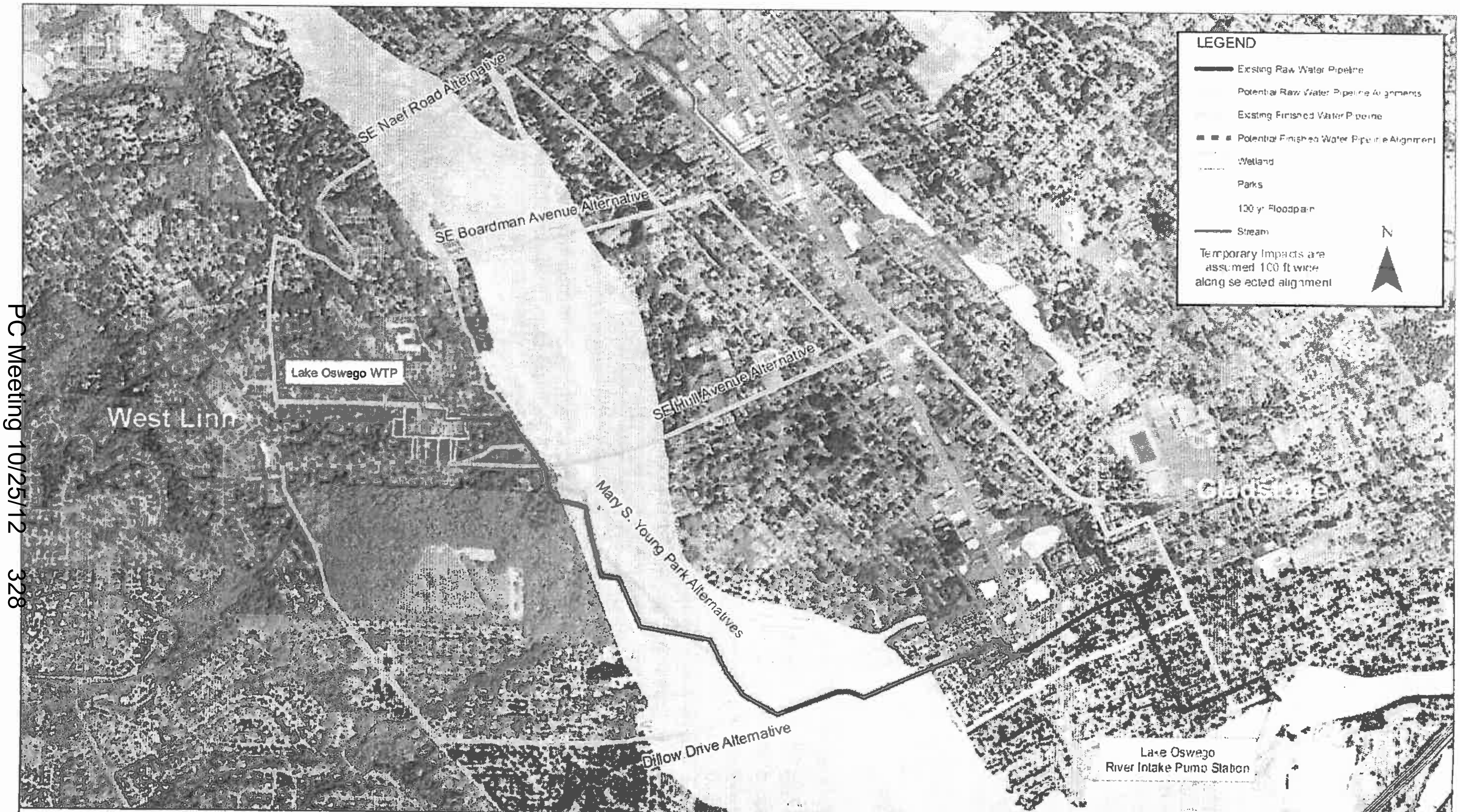
The inclined flat-plate screen, fixed tee-screen and rotating cylindrical tee-screen arrangements were evaluated during the project pre-design phase with respect to overall program evaluation parameters as follows:

- **Acceptability** – The rotating cylindrical tee screen with the brush cleaning system would be the most reliable for cleaning general debris and algae accumulations and the most accessible for periodic inspections and on-going maintenance.
- **Affordability** – The rotating cylindrical tee brush screen is the most expensive of the three screen alternatives, at an estimated cost of $561,000. The cylindrical tee screen with the air burst cleaning system is the least expensive, with an estimated cost of $295,000, and the inclined plate screen is in the middle with an estimated cost of $472,000.
- **Permitability** – All three screen alternatives would meet the NMFS screen design criteria, but the cylindrical brushed cleaned screen offers the best cleaning cycle time.

Despite the higher cost of the rotating cylindrical tee brush screens, they would be the best choice with respect to reliability, screen protection from river elements (permanence), cleaning, and ease of access for maintenance.

6.5 RWP ALTERNATIVES ANALYSIS

The proposed alternative would include construction of a new 14,000-foot-long, 42-inch-diameter RWP connecting the RIPS to the Lake Oswego WTP. The RWP would be sized to convey 38 MGD. The RWP consists of three primary segments: eastern, central, and western. The eastern segment of the RWP will extend from the new RIPS site in Gladstone to Meldrum Bar Park using primarily open-cut construction methods. The central segment of the RWP extends from Meldrum Bar Park in Gladstone near the river's edge on the east, across the river to the western HDD staging area in the vicinity of Mary S. Young State Park in West Linn. Construction methods and alignments for the central segment were



Lake Oswego · Tigard Water Partnership

Brown AND Caldwell

Raw Water Pipeline Alignment Alternative Analysis

Figure 7

considered as part of this alternatives analysis. The western segment of the RWP extends from the west side of the Willamette River in the vicinity of Mary S. Young State Park to the WTP. Conventional open-cut construction methods are anticipated for this reach.

The Willamette River crossing, part of the central segment, is a critical element in the RWP alignment. Alternatives for this river crossing consist of the following:

- Fourteen locations for crossing the river; and
- Four construction methods: open-cut, horizontal directional drilling (HDD), microtunneling, and aerial (suspension bridge) crossing.

6.5.1 Raw Water Pipeline River Crossing Alternatives Considered

During a preliminary evaluation, 14 crossing locations were considered for the RWP Willamette River Crossing. An initial fatal flaw analysis eliminated nine crossing locations due to infeasible construction access in residential neighborhoods. Five crossing locations were deemed constructible and were included in a more in-detailed evaluation (see Figure 7). Of the remaining five crossing locations, two alternatives (Naef Road and Boardman Avenue) were eliminated because of significantly longer routes and higher costs. The Dillow Drive alternative was eliminated because of a significantly longer route and large variation in ground surface elevation, resulting in significantly higher costs, more complex engineering design and long term operating challenges. The Hull Avenue alternative was eliminated because of difficult construction access, high construction impacts to neighborhoods and residential property. The only available construction method for this route would be HDD, which would result in prolonged equipment staging in a residential neighborhood including a public road closure. Additionally, the HDD pipeline alignment would pass directly under several homes and many private parcels including open space lands owned by the City of West Linn. The West Linn charter prohibits utilities within such lands. For these reasons the preferred alignment selected for crossing the Willamette River was the Meldrum Bar to Mary S. Young State Park alignment.

The benefits of the proposed Meldrum Bar to Mary S. Young alignment are that it:

- Provides good construction access on both sides of the river;
- Avoids pipeline alignment and excavations down very steep and potentially unstable banks on the east side of the Willamette River that would be necessary for the open-cut construction method;
- Minimizes the impact to heavily traveled roads;
- Avoids construction impacts to the existing raw water pipeline crossing of the Willamette River;
- Has a lower total cost due to minimized overall length and the ability to design an alignment without complex curves;
- Minimizes impact to residents and businesses, particularly with respect to the east side of the Willamette River;

6.5.2 RWP River Crossing Construction Methods Considered

Both HDD and open-cut construction methods are considered to be viable alternatives for the Willamette River crossing at select crossing locations. The aerial crossing was not considered to be a viable construction method, due to high cost and land use permitability. Preliminary cost estimates for an aerial crossing were developed by Clearspan Engineering, a pipeline aerial crossing specialty consulting firm in Houston, Texas. An aerial crossing of the Willamette River is estimated to cost approximately $8,500 per foot of length (approximately $21.3 million for the chosen alternative length of 2,500 feet), which is nearly double the cost of HDD and open-cut alternatives. All aerial crossing alternatives were eliminated from further consideration. The aerial crossing construction method would make it difficult to permit because it would require an aerial crossing tower, and anchors and anchor cable in both Meldrum Bar and Mary S Young Parks.

Microtunneling was not considered to be a viable construction method, due to high cost and geological characteristics of the rock. Preliminary construction cost estimates for microtunneling were significantly higher than for the HDD and open-cut alternatives. In addition, the rock through which the alignment passes was found to have strengths in the range of 40,000 psi, while microtunneling is typically suited for rock strengths of 15,000 psi or less. As a result, all microtunneling alternatives were eliminated from further consideration.

After a comprehensive evaluation of alternative crossing designs, through a process that included workshops, value engineering exercises, and multiple geotechnical investigations, the Project Sponsors selected the alternative of crossing the Willamette River via HDD. Crossing the Willamette River by open-cut methods was initially preferred based on preliminary geotechnical results and value engineering. However, subsequent analysis confirmed that HDD was a feasible construction method at this location and all previous concerns regarding HDD were resolved to the satisfaction of the project team. Therefore, an open-cut method was rejected in light of the less impactful and feasible HDD method. The following analysis provides an in-depth look into the methodology and associated risks of using HDD verses those of the open-cut construction method. The information below was obtained from contractors and consultants with substantial qualifications in HDD technology, including Staheli Trenchless Consultants and Jacobs Associates.

6.5.2.1 HDD Construction Methodology and Associated Risks

The HDD Willamette River crossing would be constructed by setting up an entry operation at a staging area located in the vicinity of Mary S. Young State Park on the west bank of the Willamette River, with the exit point in Meldrum Bar Park on the east bank. The HDD entry and exit points have been carefully placed to minimize the risk of the crossing and to reduce construction impacts as much as possible to the park properties, the Willamette River, and surrounding wetlands. The Meldrum Bar site was selected as the exit side because it provided the only location from which the fully assembled pipe could be pulled into the HDD borehole without significant disruption to roads, parks, and nearby residents. Pilot hole and reaming operations would be accomplished from the western HDD staging area in the vicinity of Mary S. Young State Park HDD entry location. After pilot hole and reaming operations were completed, the carrier pipe pull-back system would also be deployed at the western HDD entry site. During this pipe pull-back operation, the pipe would be strung and assembled on the Willamette River (on barges) off-shore from Meldrum Bar Park or assembled off-site and transported to Meldrum Bar Park, and strung along the river upstream of the HDD exit point for pull-back.

The total period of HDD construction would be between six to nine months. The boring depth would range from 25 to 60 feet below the river bed.

The HDD process includes boring a hole using fluid-assisted cutting and removing the excavated material in a drilling mud slurry. As such, it relies on stable geotechnical conditions or mitigation measures that keep the borehole open during excavation, so that the drilling mud can flow through the bore and remove the excavated material. Ideal materials for HDD include firm silts or clays, dense sands, or rock. HDD construction costs and risks increase where geotechnical conditions include soils or rock that is unstable. Open-graded gravel presents more risks than other geotechnical conditions; however, current risk mitigation strategies can enable successful HDD installation in open-graded gravels.

6.5.2.1.1 Geotechnical Conditions at the Proposed Crossing Location

The geology along the proposed Willamette River crossing consists of sandy gravel alluvial deposits of silt, sand, and gravel for approximately 350 feet, transitioning into a zone of slightly weathered basalt for approximately 100 feet, and further transitioning into over 2,000 feet of high-strength unweathered basalt flow(s) of the Columbia River Basalt Group.

Geotechnical investigations indicate that the unweathered basalt in this location has a compressive strength ranging from 17,800 to 41,000 psi (R4-R5). However, at other locations along the bore, basalt bedrock, which was encountered at Elevation (El.) -56 feet, is fractured and contains slickensides and brecciated zones, indicating that the rock may have been sheared at these locations.

Meldrum Bar Park is located on a low, broad, flat alluvial terrace, which consists of unconsolidated silt, sand, and gravel deposits. Zones of open-graded gravel and cobbles are expected within the alluvial soils. One of the vertical boring logs indicated the loss of drilling fluid at an area of high blow counts with very low sample recovery. This is indicative of open-graded gravel or cobbles. Basalt bedrock was not encountered in one boring (HDD-1), which extended down to El. -95.2 feet. Over 45 feet of clayey decomposed basalt underlies the alluvium in boring HDD-1. This material is juxtaposed against approximately 12 feet of gravelly decomposed basalt in boring HDD-2 within the river channel.

An east or northeast trending inactive fault, which cuts across the Willamette River channel between borings HDD-1 and HDD-2, may explain the lack of basalt outcrops, the change in geomorphology, the lack of bedrock in boring HDD-1, and the presence of sheared zones in boring HDD-2. The bedrock surface on the north side of this fault is expected to be irregular.

6.5.2.1.2 HDD Risks Associated with Proposed Crossing Location

Both of the HDD experts (Staheli Trenchless Consultants and Jacobs Associates) that evaluated the potential RWP alignments identified the following risks and available mitigation measures associated with an HDD crossing at this location. Available mitigation measures will significantly reduce, if not eliminate, the following risks:

- The RWP is anticipated to pass through an abrupt transition between hard rock and alluvial deposits, which has been inferred to be an inactive fault. This transition may cause borehole instability if proper mitigation measures are not employed;
- **Hydrofracture** in unconsolidated alluvial gravel deposits could result in borehole collapse, loss of drilling mud, reduced drilling efficiency, and the inability to remove excavated material if proper mitigation measures are not employed; and
- Construction may result in **impacts to the public parks** on either side of the river crossing; construction staging layout during the design stage will focus on reducing public impacts to a reasonable level.

6.5.2.1.2.1. Drilling Across the Fault Line

An inactive fault line exists between geotechnical exploratory bore holes HDD-1 and HDD-2, which will result in drilling from hard rock (R4) into alluvial deposits in the vicinity of bore hole HDD-2. The primary risk of the fault crossing would be borehole instability. A preliminary evaluation by RSR Solutions, Inc., a Value Engineering team that included an expert in HDD technology, reviewed the alternative during a Value Engineering process identified the risk that the HDD drilling rods could bind up at this fault zone. Subsequent research by Staheli Trenchless has identified that the use of common HDD mitigation measures such as pumping grout into fractured rock areas prior to drilling and deploying Loss Circulation Material (LCM) within the bore hole to seal-up potential fractures can eliminate the risks of bore hole stability and binding of the drill rods. There is no concern that this inactive fault line poses risk to the pipeline beyond the construction phase.

6.5.2.1.2.2. Hydrofracture

Hydrofracture is a risk often associated with drilling in open-graded gravel deposits in which drilling fluid pressure exceeds the strength and confining stress of the soils surrounding the borehole. The excess pressure fractures the soil around the bore, allowing drilling fluid to escape from the borehole. The risk of hydrofracture was not found to be significant, except at the portions of the alignment located within open-graded gravel at the shallow portions of the alignment near the entry and exit locations where overburden is reduced and increased void space around grains may allow fluid escape. There is also a risk of borehole caving during reaming when gravel or cobbles are located in the crown of the bore. These materials are anticipated within the first 500 feet of the bore from Meldrum Bar Park. At Meldrum Bar Park, a conductor casing, an oversized pipe through which the bore hole is drilled, will be used for the first 200 feet to completely contain any potential hydrofracture and prevent borehole collapse. Other mitigation measures will be employed for the remaining 300 feet of open graded gravel in Meldrum Bar Park such as grouting and using LCM to significantly decrease the risks of hydrofracture or borehole collapse during drilling. The proposed HDD alignment has sufficient clear space from the existing RWP and additional monitoring measures will be put in place to ensure vibrations created during installation of the conductor casing via pipe ramming methods will not damage the existing pipeline.

6.5.2.1.2.3. Impacts to Public Parks

HDD installation will require construction staging areas to be located in two parks, one on either side of the Willamette River: Mary S. Young Park on the west side of the river, where the HDD construction entry point is anticipated to be located, and Meldrum Bar Park on the east, where the exit point and pipe pull-back area is anticipated to be located. The equipment staging areas needed for HDD will be approximately 0.6 acres at Meldrum Bar Park. The staging area has not yet been selected for the staging area in the vicinity of Mary S. Young State Park. The estimated duration for these staging areas is 6 to 9 months. A pipe layout area of approximately 1.5 acres (3,200-foot-long by 20-foot-wide) will be required on the river off-shore from Meldrum Bar Park for a shorter period of approximately 2 months during pipe assembly (welding and lining) and pull-back. The proposed staging areas for HDD construction will be situated to allow continued use of all park facilities including boat ramps and trails. HDD staging areas may result in limited tree and vegetation removal that will be mitigated where ever necessary. The pipe layout area on the river will be parallel and well to the side of the main channel.

HDD operations would be set up in the western HDD staging area in the vicinity of Mary S. Young Park above OHW. Pilot and reaming operations would be accomplished from this site. After pilot and reaming operations are completed, the pipe would be strung and assembled in Meldrum Bar Park for pull-back. Because of the limited bending radius of 42-inch-diameter welded steel pipe, the pipe will be laid out on the river via barges. The actual pulling operation is anticipated to be accomplished in one to two days. Cranes will be needed on the river for lofting the pipe for pulling into the borehole. No closure of either Mary S. Young or Meldrum Bar Park is anticipated during any stage in the HDD construction process.

The primary difference between the impacts to parks of HDD construction versus open-cut construction is associated with slight increase in the area required for the HDD entrance and exit staging areas and the additional area required for pipe assembly and pull-back. The slight increase in staging areas at Meldrum Bar and Mary S. Young Park is not anticipated to be significant as all park facilities will be accessible throughout construction. The impact from pipe pull-back is not considered significant as it will not affect Meldrum Bar Park and will be clear of the main channel and high boat traffic areas on the river.

6.5.2.1.3 HDD Cost Estimate

An initial review of the proposed HDD alignment by RSR Solutions, Inc., Jacobs Associates, and Staheli Trenchless Consultants and subsequent detailed cost estimate by Staheli Trenchless indicates that the cost of HDD will exceed the open-cut method by approximately $5 million. This cost includes mitigation measures that will significantly reduce or eliminate the risks discussed above and contingency for any additional uncertainty associated with HDD construction including costs resulting from installing conductor casing, grouting and using LCM.

6.5.2.2 Open-Cut Construction Method and Associated Issues

There are three distinct "in-water work" regions for the RWP open-cut river crossing alternative, where "in-water work" is any work below the ordinary high water line. The three in-water work areas for pipeline construction are: (1) in the Willamette River, (2) on the gravel bars east and west of the Willamette River, and (3) additional land work to arrive at the land-based raw water pipeline contract termination points. The open-cut method description and evaluation below pertain to pipeline construction below the ordinary high water line.

6.5.2.2.1 Open-Cut Construction Method

The open-cut river crossing trench is assumed to be benched at a slope of 2:1 (horizontal-to-vertical). Onshore staging for open-cut construction would be within portions of both Meldrum Bar Park and Mary S. Young State Park. Main river channel crossing work will be completed from barges using drag line or clamshell excavators. Material will be side-cast in the river and recovered for trench backfill pipe installation, although pipe bedding material will be imported via barges. Pipe will be set in place by barge-mounted cranes. It is expected that pipe segments will be joined on land to approximately 40-foot lengths to minimize the number of in-river joint connections that will be assembled by divers. Imported bedding material will be clean rock two to three inches in size, which will encapsulate the 42-inch-diameter pipe in the trench. Native material from the side-cast spoils will be placed in the trench over the pipe. To further protect the pipe and trench from scour erosion, riprap surface protection may be placed over the open-cut installation within the trench or at grade line. Rip-rap to be placed above the pipe zone material and beneath the side-cast excavation backfill material will also be imported using barges. Depth of cover of the pipe will range between 10 feet and 20 feet or more, with the intent being to match the elevation of the existing pipeline. The spoils that would remain outside of the trench as a result of the volume occupied by the pipe and imported bedding material may be disposed of in a number of different ways, including relocating the spoils to a downstream scour hole, excavating and disposing off-site, and flattening in place. Shoreline work will be completed using conventional excavation equipment on mats with materials delivery via barge as necessary.

6.5.2.2.2 Sediment Evaluation Framework (SEF)

The U.S. Army Corps of Engineers Sediment Evaluation Framework (SEF) provides guidance for the assessment and characterization of freshwater and marine sediments in Idaho, Oregon, and Washington. For the open-cut RWP alternative, 12 pieces of information were compiled for the SEF Level 1 Site History Review. This review identified insignificant risk of those potential contaminants being present. Based on these results, it was determined that physical and chemical testing was not warranted.

6.5.2.2.3 Beneficial Use of Trench Spoil Material

It is anticipated that there will be an excess amount of native spoil material from trenching the pipeline, estimated to be 11,500 cubic yards. The excess native spoil material may be placed within the Ross Island Wetland and Riparian Habitat Reclamation Plan (Ross Island Plan) area. Implementation of the Ross Island Plan will result in development of 118 acres of upland forest, 22 acres of wetland habitat, and 14 acres of shallow water habitat. Because the SEF determined that the excavated trench material is suitable for in-water placement, it is anticipated that Ross Island Sand and Gravel will accept the material; however, there has been no coordination with Ross Island Sand and Gravel.

6.5.2.2.4 Risks and Consequences at the Selected Crossing Location

A thorough geotechnical boring investigation was conducted along the open-cut river crossing alignment. These borings did not encounter rock outcroppings that would impact open-cut construction methods and cost; therefore rock excavation is not considered a risk of the open-cut construction methodology at this location. A thorough analysis of other potential risks for an open-cut construction methodology identified the following major risks:

- An open-cut crossing will require extensive underwater excavation, which will result in an increased risk of undesirable **turbidity levels** in the area surrounding the project. However, available mitigation measures will be able to decrease this risk;
- An open-cut crossing will require a significant amount of construction to occur with-in the designated **in-water work window**. Although the duration of the work is not anticipated to extend beyond the work window, there are many unknowns in marine construction which could result is delays, which could result in missing the target window; and
- Open-cut pipeline installation will require a significant amount of equipment and activity. Additionally, marine construction crews will need access to their equipment from shore, which will result in impacts to parks on both sides of the river. This equipment and activity will result in adverse **impacts to the river and parks** within the vicinity of the construction location.

6.5.2.2.5 Turbidity Levels

Due to the large amount of underwater excavation required for an open-cut crossing of the Willamette River there is a high risk of increased turbidity. Turbidity control related to open-cut construction will occur through a multi-pronged approach that includes monitoring, silt curtain implementation, minimal spoils relocation, and careful spoils side-casting placement.

Turbidity may be reduced by maintaining silt curtains downstream of the excavation and side cast activity as it progresses across the river. Silt curtains promote settlement within a relatively short distance downstream from the disturbance activities. The following silt curtain measures would be considered:

- Prior to excavation, silt curtains would be deployed downstream from earthwork activity to allow side-casting of excavated material.
- Silt curtains would be anchored to a barge or floats, establishing an in-river anchoring system.
- Silt curtains would be installed and maintained as the excavation and backfill operations move across the river channel.
- Silt curtains would be maintained during harvesting of excess spoils materials for off-site disposal.

A spoils management plan will be developed to address the portion of spoils that will not be used to backfill the trench. Some material (if not needed for backfill) could be placed in a barge and taken elsewhere for disposal or, if suitable, to a gravel material processor.

In order to minimize the effects of the open-cut crossing, silt curtains will be placed to isolate the shallow water shoreline areas. This method was used for a pipeline crossing of the lower Clackamas River in 2004. Any juvenile salmonids isolated between the silt curtain and the bank would be removed prior to excavation within the isolation area. Silt curtains would be used in the main channel. This type of silt curtain arrangement can be designed for containment in the deeper, swifter portion of the channel for river velocities of up to 2.5 fps. Summer main channel velocities at this location in the Willamette range from 1.0 to 2.3 fps. Although, no measurable long-term effects would be anticipated from the excavation activities and mitigation measures will be in place there is still a risk of increased turbidity during construction.

6.5.2.2.6 In-Water Work Window and Fish Presence

The preferred ODFW in-water work window for the affected section of the Willamette River is July 1 through October 31. It is expected that open-cut construction could be mobilized in the river for this entire period.

This in-water work window partially coincides with peak fall Chinook adult migration into the Clackamas River; some, more limited adult steelhead and coho migration into the Clackamas River; and the end of the adult Upper Willamette River spring Chinook migration. Lower Columbia River (fall) Chinook spawn in the lower Clackamas River and could potentially spawn at Meldrum Bar, although spawning has not been confirmed at this location.

6.5.2.1.2.4. Impacts to the River and Parks

Open-cut installation will require a large footprint of marine construction equipment including delivery barges, assembly barges, crane barges, dive barges, and work boats within the vicinity of the construction area. A significant amount of the marine work will be conducted within the main channel of the Willamette River and thereby affect river traffic and recreational activities near the construction area. Additionally, access to marine equipment will be made from Meldrum Bar Parks which could require temporary docks and access to boat ramps and possibly result in restrictions to park facilities.

6.5.2.2.7 Open-Cut Cost Estimate

As stated above, initial cost estimates indicate that the open-cut method is significantly less expensive than the HDD alternative by approximately $5 million. However, it is very difficult to determine the cost of potential risks and large construction claims. As construction claims and risk mitigation has been more fully explored for the HDD option, it is anticipated that the open-cut construction costs would increase with more development.

6.5.3 HDD versus Open-Cut Construction Alternatives Evaluation

HDD and open-cut construction methods for the Willamette River RWP crossing were evaluated in relation to the three evaluation criteria of acceptability, affordability, and permitability, based on the findings discussed in the previous sections. Despite being more expensive, the HDD construction method was selected as the most desirable alternative based on the information presented above and the evaluation below.

- **Acceptability** – Use of the HDD construction method of the Willamette River RWP crossing is a more acceptable alternative because it would significantly decrease the amount of in-water work and potential adverse impacts to the Willamette River and recreational users. The duration of construction at each side of the river resulting from HDD construction will be will significantly longer than what would be required for open-cut, but the construction areas will be small and still allow full access and use of the facilities at each park. Available HDD mitigation measures reduce construction risks that could cause delays in the completion of the project and additional impacts. Construction risks during open-cut construction could result in construction delays in which the project duration could possibly extend beyond the allowable in-water work window resulting in additional impacts to fish, recreation, and traffic in the river.
- **Affordability** – The HDD alternative is estimated to be more expensive than the open-cut alternative by approximately $5 million dollars, or roughly 80 percent of the cost of the estimated open-cut RWP crossing.
- **Permitability** – The HDD alternative avoids the possible impacts to listed fish. Although open-cut construction of the RWP across the Willamette River could be completed during the Willamette River in-water work window, construction risks could result in decreased water quality (increased turbidity) during the in-water work window or project delays resulting in construction extending beyond the allowable schedule. Either a decrease in water quality during the in-water work window or project delay could result in an impact to adult upstream and juvenile downstream migrants.

6.6 FINISHED WATER PIPELINE

The FWP has four potentially environmentally sensitive water and wetland crossings: Oswego Creek, Oswego Lake, the Lake Oswego Hunt Club, and Springbrook Creek.

6.6.1 Oswego Creek and Lake Crossing Alignment

There are four alternatives for constructing a pipeline across and around Oswego Creek and Oswego Lake (see Figure 8):

1. Attach the pipeline to the Highway 43 Bridge;

2. Attach the pipeline to the McVey Bridge;
3. Open cut Oswego Creek and install the pipe in a trench; or
4. Use an alignment that avoids Oswego Creek, west along Laurel Street.

The Highway 43 Bridge over Oswego Creek is old and has seismic stability issues. There are no planned improvements to this bridge that would rectify these issues. If the pipeline were to be attached to the bridge, substantial bridge improvements would likely be necessary to allow this alternative to move forward. These improvements, although not specifically estimated as part of the alternatives analysis, would be very expensive, perhaps prohibitively so.

The McVey Bridge lacks any known comprehensive seismic reports and is located approximately 100 feet downstream from the Oswego Lake Dam owned by the Lake Corporation. The outcome of several workshops conducted by the Project Sponsors concluded that the FWP was not worth the perceived risk of the effect of an unknown seismic event on the bridge or dam that could potentially damage the FWP. In addition, crossing McVey Bridge would include open-cut construction methods on the heavily traveled McVey Avenue and on State Street, which would have an extensive negative impact on the entire community.

Installing the pipeline in a trench across Oswego Creek also has some significant drawbacks. Oswego Creek runs through a steep, narrow ravine in the area of the crossing. The slopes are wooded and geologically unstable, with exposed rock in some areas. Construction in unstable slopes and in rock increases costs and poses difficulties that are better avoided. Avoiding cutting the wooded areas is also preferable from an environmental perspective. Additionally, Oswego Creek crossing alternatives could be disruptive to George Rogers Park. Therefore, the preferred alternative would be to not cross Oswego Creek, but rather to construct the pipeline so that it travels west along Laurel Street and then resumes its northward path upstream from Oswego Creek. This alignment would cross the southeast arm and Lakewood Bay portions of Oswego Lake.

To minimize traffic-related and environmental construction impacts, the FWP would be constructed under Oswego Lake by the HDD method. The preferred alignment along Laurel Street would travel west on Laurel Street from Highway 43 to Erickson Street and then travel north on Erickson Street to the HDD exit staging area, located at Erickson Street and McVey Avenue. The 2,600-linear-foot HDD alignment would cross under several private properties, the southeast arm of Oswego Lake, Kenwood Road, Lakewood Bay, and the Union Pacific Railroad to the HDD entrance staging area at the intersection of Fifth Street and Cabana Lane. From this location, the FWP alignment would continue in a northwesterly direction through public rights-of-way to the Lake Oswego Hunt Club and Springbrook Creek crossing.

6.6.2 Oswego Creek and Lake Crossing Alternatives Evaluation

The FWP alignment at these locations were evaluated in relation to the three evaluation criteria of acceptability, affordability, and permitability, based on the findings discussed in the previous sections. The Laurel Street to Erickson Street with the HDD crossing of Oswego Lake alignment was selected as the most desirable alternative based on the above information and the evaluation below.

- **Acceptability** – The Oswego Creek alignment was found to cause the most disturbance to the communities in the area of the alignments. The Laurel Street HDD alignment provides the least disturbance to the surrounding communities and avoids the temporary impact of crossing

Brown and Caldwell	JPA Alternative Analysis	Finished Water Pipeline Central Segment Alternatives	Figure 8

Oswego Creek. The alignment alternatives that attach the FWP to either the Highway 43 Bridge or the McVey Bridge both pose seismic stability issues.

- **Affordability** – The Laurel Street HDD alignment is comparably priced but avoids the seismic stability issues of the alternative that attaches the FWP to the McVey Bridge or Highway 43 bridge.
- **Permitability** – The Laurel Street HDD alternative would avoid temporary impacts to Oswego Creek. This alternative would be permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented.

6.6.2 Lake Oswego Hunt Club and Springbrook Crossing Alignment

There are two location alternatives for constructing a pipeline across and around the Lake Oswego Hunt Club and Springbrook Creek (see Figure 9):

1. Install the pipeline in the Iron Mountain Boulevard right-of-way south of the Lake Oswego Hunt Club and cross Springbrook Creek within the Iron Mountain public right-of-way;
2. Install the pipeline through the Lake Oswego Hunt Club and cross Springbrook Creek immediately west of Hunt Club property

The Iron Mountain Boulevard right-of-way near the Hunt Club and the Springbrook crossing has a number of major utility installations and traffic limitations. The presence of utilities may result in the need for several utilities to be relocated in order to secure a corridor for the new FWP pipe. A traffic circle has been installed immediately west of the Springbrook Creek crossing that significantly decreases traffic control options to the point that a complete road closure would most likely be required to install the FWP through this area. Springbrook Creek crosses Iron Mountain Boulevard via a concrete culvert immediately east of the traffic circle. Recent survey identified that there is sufficient clearance above the culvert to allow the FWP to be installed above the culvert. Therefore, there would be no impacts to Springbrook Creek resulting from this alignment alterative.

The other alternative considered would avoid this congested section of the Iron Mountain Boulevard right-of-way. The Hunt Club alignment would require pipeline installation through the Lake Oswego Hunt Club property to the north of the right-of-way and cross Springbrook Creek immediately east of Brookside Road. This alignment through the Hunt Club would have minor impacts to degraded wetlands, but would otherwise stay within grassy fields used for recreational horse riding. After crossing through the Hunt Club, the alignment would cross Springbrook Creek via auger boring construction methods. Using auger boring methods could impact native fish passage and have minor impacts to the waterway. However, this construction method would require temporary diversion of the creek into a bypass pipe that would be installed in the stream bed. This temporary creek diversion would start upstream and extend downstream of the crossing location and would decrease the amount of construction dewatering required within the bore hole. Additionally, the trenchless crossing would require a jacking pit that would be over 30 feet deep within the Brookside Road right-of-way. This pit would result in significant traffic impacts on the road and may result in access issues for residents who rely on Brookside Road for access to their homes. After crossing Springbrook Creek, the alignment would continue on public right-of-way and property in a westerly direction to the City of Lake Oswego's reservoir on city-owned property near Waluga Park.

6.6.4 Lake Oswego Hunt Club and Springbrook Crossing Alternatives Evaluation

The FWP alignment at this location was evaluated in relation to the three evaluation criteria of acceptability, affordability, and permitability, based on the findings discussed in the previous sections. The alignment alternative along Iron Mountain Boulevard crossing over the Springbrook Creek culvert within the existing roadway, through the traffic circle and continuing west along Upper Drive was selected as the most desirable alternative based on the above information and the evaluation below.

- **Acceptability** – The Hunt Club alignment was found to cause the most disturbance to the communities in the area of the alignments. The Iron Mountain Boulevard alignment provides less disturbance to the surrounding communities.
- **Affordability** – It is estimated that the Iron Mountain Boulevard alignment was the least expensive. A longer alignment and expensive auger bored crossing of Springbrook Creek for the Hunt Club alternative makes it a less attractive financial option.
- **Permitability** – The Iron Mountain boulevard alternative would have no environmental impacts. The Hunt Club alternative would temporarily impact Springbrook Creek and slightly impact degraded wetlands.

7 CONCLUSION

The proposed project would expand the current Lake Oswego and Tigard water supply facilities to accommodate the existing and future needs of both the City of Lake Oswego (24 MGD) and the City of Tigard (20 MGD), utilizing Lake Oswego's senior and junior water rights on the Clackamas River of 38 MGD. The City of Tigard will also use its ASR system as a supplemental supply source for up to 6 MGD during peak demand periods. The proposed project is the only alternative that meets the Project Sponsors' objectives of providing an adequate, safe, reliable, long-term, acceptable, and affordable regional water supply to Lake Oswego and Tigard, both for current demands and for the anticipated growth in demand forecast to occur over the 30-year planning horizon. Water supply source reliability is ensured for both Lake Oswego and Tigard through the ownership of their water supply. The proposed project would also be the most acceptable to the communities that it serves because the Clackamas River is an excellent source of high quality raw water and new infrastructure would replace unreliable and obsolete facilities at the lowest NPV of all alternatives considered.

The proposed project will reliably serve the needs of both communities for the long term and can be fully operational by the expiration of Tigard's contract with Portland on June 30, 2016.

The construction methods, construction timing, and alignment details have been developed to minimize environmental impacts by avoiding waters and geologically unstable areas and by boring major crossings to the extent practicable.

Lake Oswego · Tigard
Water Partnership

Figure 9
FWP Alignment Alternatives

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Lake Oswego · Tigard Water Partnership
sharing water · connecting communities

Brown AND Caldwell

Technical Memorandum

Date: April 17, 2012

Prepared for: Lake Oswego Tigard Water Partnership

Subject: Joint Permit Application Alternatives Analysis

To: Karla Ellis, Project Manager, Portland District, USACE
Mike Turaski, Section Chief, Portland District, USACE

From: Terry Buchholz, Project Permitting Task Lead
Integrated Water Solutions, LLC

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1 INTRODUCTION

In August 2008, the cities of Lake Oswego and Tigard (the "Project Sponsors") entered into a partnership agreement for sharing drinking water resources and costs. Lake Oswego's water supply system was nearing capacity, and key facilities needed expansion and upgrades. Tigard residents needed a secure, dependable water source. Both cities want to keep water affordable for their customers, and sharing the cost of new infrastructure to serve both communities does that. Sharing water resources isn't new. Lake Oswego and Tigard have benefitted from a water sharing relationship dating back to the 1970s—Lake Oswego as the seller of water, Tigard as the buyer. The Oregon Water Resources Department (OWRD) and the conservation community encourage regional water supply planning and collaboration among multiple communities as an efficient and environmentally responsible way to manage water needs.

This Alternatives Analysis presents the following:

- Project need;
- Project purpose;
- Water supply source alternatives evaluation criteria, description, and evaluation; and
- Proposed project design/location/alignment alternatives evaluation criteria, description, and evaluation.

2 PROJECT NEED

The cities of Lake Oswego and Tigard have grown in population since their incorporations in 1910 and 1961, respectively, and have increased demand for water even though they have implemented water conservation measures. Lake Oswego and Tigard have undeveloped land within their Metropolitan Area Boundaries (the "Urban Growth Boundary") that were established by the Metropolitan Government (Metro). Development of these lands will increase the demand for water. The elected officials and governments of Lake Oswego and Tigard are responsible for ensuring adequate, safe drinking water for current and future citizens, and that responsibility involves planning for, financing, and building infrastructure that supports the needed safe drinking water supply in a manner consistent with water rights permits and state and federal environmental law.

Major components of the City of Lake Oswego's water supply system, which was constructed in the late 1960s, are nearing the end of their ability to reliably meet the water demands of the city residents and wholesale customers. Key facilities need to operate with best utility and engineering practice. In addition, operations staff at the water treatment plant must exercise extraordinary care and diligence to ensure that treated water quality standards and goals are consistently achieved, regardless of incoming water quality. Despite conservation efforts and investments made in Lake Oswego's supply and treatment infrastructure to squeeze every bit of capacity and value from the more than 40-year-old system, renewal, replacement, and expansion of facilities must occur to reliably and economically meet this community's long-term needs for a safe drinking water supply.

The City of Tigard does not currently have an ownership position in a primary water supply source, and therefore has limited control over the availability and increasing cost of its water supply. Tigard currently obtains its water primarily through a contract with the City of Portland, and during peak use, in spite of significant conservation efforts, demand exceeds the contracted water allotment, and infrastructure capacity. Currently, Tigard can only obtain 5.9 MGD from the City of Portland using the existing connections. Additionally, purchase of water from the City of Portland is more costly and availability of water is not guaranteed. The City of Tigard seeks a partnership in a water supply system that can ensure access to an affordable, adequate, reliable, long-term supply of safe drinking water.

Both communities—Tigard and Lake Oswego—want to pool their resources, implement real multi-community regional water supply planning, and replace the historical approach of isolated city-by-city competition for water with a cooperative approach on a joint project that will endure for the benefit of both for many years to come. Such projects cannot and should not be limited to the current need, but must take into account future need based on Metro decisions on urban growth within the Urban Growth Boundary as well as realistic growth projections that, as is the case with Lake Oswego and Tigard, have been reviewed and found reasonable by the OWRD.

3 PROJECT PURPOSE

The project purpose is to upgrade, replace, and expand Lake Oswego's existing drinking water infrastructure to provide water to Lake Oswego and Tigard, to satisfy current demands and for the anticipated growth in demand forecast to occur over the 30-year planning horizon.

To ensure that the project purpose is achieved, the project must meet the following project objectives. Specifically, the project must:

- Be an ***adequate source*** of ***safe*** drinking water to supply the current and future demands of the citizens and wholesale customers of Lake Oswego and Tigard over the 30-year planning horizon;
- Be a ***reliable, long-term*** supply that satisfies the water demands of the cities for the 30-year planning horizon while acknowledging the many uncertainties inherent in long-term water supply planning (e.g., population growth rates, development patterns and density, changes in basin hydrology, local and national economic conditions, changes in environmental regulations, conservation, etc.);
- Be a supply source that is ***acceptable*** and ***supportable*** by the policy makers and the end water users within Lake Oswego and Tigard, including residents, businesses, and wholesale customers, in the context of a safe drinking water supply as well as for the protection of the natural environment of Oregon;
- Be an ***affordable*** source that makes an efficient use of public dollars spent as measured by the cost per gallon of water delivered over the planning horizon; and
- Be ***permitable, constructible***, and ***operational*** (including a 12-month operational startup and testing period) by June 30, 2016 (the expiration date of Tigard's contract with the City of Portland).

4 WATER SUPPLY PLANNING

Water supply planning information relevant to the Lake Oswego Tigard Water Partnership is summarized in the following sections including forecasted future water demand, water rights and water conservation.

4.1 WATER DEMAND

The cities of Lake Oswego and Tigard will need a reliable, long-term supply that satisfies the water demands of the cities for the 30-year planning horizon. Demand forecasts were completed for both cities using population projections and historical per capita demand values. The future peak day demands were forecasted to be 24 million gallons per day (MGD) for Lake Oswego and 20 MGD for Tigard, for a total system peak day demand of 44 MGD (Brown and Caldwell, 2011).

4.2 WATER RIGHTS

The City of Tigard holds seven surface water rights for local irrigation purposes only. The City of Tigard does not solely hold any surface water rights that could be used for municipal water supply purposes.

In addition to its non-municipal surface water rights, the City of Tigard also holds five groundwater rights within the Tualatin River Basin that authorize a total use of up to 2.3 MGD for municipal purposes. These municipal groundwater rights are within the Cooper Mountain-Bull Mountain Critical Ground Water Area (CMBM CGWA). The CMBM CGWA order limits the total use of groundwater from the basalt aquifer within the CGWA and the City of Tigard must request that OWRD authorize use of a quantity of water each year.

The City of Tigard is also a member of the Willamette River Water Coalition (WRWC), which holds permit S-49240 for use of water from the Willamette River. The WRWC holds this water right permit and Tigard could have future access to this water right through a cooperative agreement with WRWC. Tigard does not currently have access to water under this permit because of the lack of public confidence in the Willamette River as a source and the excessive cost of treatment and delivery.

The City of Tigard has a limited license to operate its Aquifer Storage and Recovery (ASR) system as a supplemental supply source. By 2016, the ASR system would provide a supplemental capacity of 5.8 MGD that would be used during times of seasonal peak demand.

The City of Lake Oswego holds permits and certificates that authorize the use of surface water from the Clackamas and Willamette rivers as well as from three groundwater sources. The City of Lake Oswego holds two water right permits for the Clackamas River authorizing diversions of up to 38 MGD. Lake Oswego's senior water right of 32 MGD, with a priority date of March 14, 1967, has priority because it is senior to the instream water right located on the same stretch of river. This instream right has an August 26, 1968 priority date and preserves stream flow to support aquatic life. Lake Oswego also has a 6 MGD water right permit that is junior to the instream water right.

In 2001, Lake Oswego received a certificate for a "partial perfection" of its senior water right. By partially perfecting this water right, Lake Oswego proved that 16 MGD of water had been beneficially used in accordance with the permit conditions. Oregon water law allows permits to be incrementally perfected in amounts not less than 25 percent of the full permitted amount. Oregon water law also establishes a process by which municipal permit holders may seek additional time to fully develop their permits. Lake Oswego sought an extension of time to fully develop the remaining 22 MGD of its Clackamas River water rights permits. In 2007, the OWRD issued a Proposed Final Order to extend the permit until 2040, but the order was protested and went to a contested case hearing. The hearing before an administrative law judge concluded in March 2010. In a ruling issued August 2010, Judge Barber found that OWRD properly granted the extensions and conditioned the extended permits to maintain persistence of listed fish. In response to this ruling, OWRD issued a Final Order for the remaining 22 MGD. The Final Order stipulates conditions that must be followed in order to maintain the persistence of fish in the Lower Clackamas River. Those conditions are as follows:

a Minimum fish flow needs on the Lower Clackamas River as recommended by ODFW are presented in Table 1, below, and are to be measured at United States Geological Survey (USGS) Gage Number 14211010, Clackamas River near Oregon City, Oregon, or its equivalent.

b In cooperation with other members of the Clackamas River Water Providers[1] (CRWP), the City of Lake Oswego must have an annual meeting with ODFW to devise a strategy to maximize fishery benefits that can be derived from CRWP's Stored Water Agreement[2] with Portland General Electric (PGE) for the release of stored water from Timothy Lake. This is of particular significance when augmenting stream flow during the period of July 1 through November 30.

c From the first Monday in September through June 30, the maximum total amount of the undeveloped portion of the Permits S-32410 and S-37839 that can legally be diverted shall be reduced in proportion to the amount by which the flows shown in Table 1 are not met based on a seven-day rolling average of mean daily flows measured on the Clackamas River at USGS Gage Number 14211010, near Oregon City, Oregon, or its equivalent as demonstrated in the following examples.

Example 1:

On June 15, the last seven mean daily flows were 750, 725, 700, 650, 625, 600 and 575 cubic feet per second (cfs). The seven-day rolling average is 661 cfs. The maximum total amount of the undeveloped portion of the permit that could legally be diverted under this permit would not be reduced, because the seven-day average of mean daily flows is greater than the 650 target flow for June 15.

Example 2:

If on June 15, the average of the last seven mean daily flows was 578 cfs, then the target flows would be missed by 11 percent (100 - [(578/650)x 100)]). If the maximum total amount of the undeveloped portion of the permit that can legally be diverted under this permit is 10 cfs, then the maximum total amount of the undeveloped portion of the permit that could be legally diverted under this permit would be reduced by 11 percent. The maximum total amount of the undeveloped portion of the permit that could be legally diverted under the permit under this condition would be 8.9 cfs (10-[10 x 0.11] = 8.9).

[1] The Clackamas River Water Providers is an entity created pursuant to ORS 190 comprised of water providers on the Clackamas River that are working together on water resource issues. The purpose of the organization is to collectively fund and coordinate efforts regarding water resource planning and management, water conservation, and the development of the Clackamas River on a sustainable basis. Lake Oswego is a member of this group.

[2] PGE and the Clackamas River Water Providers have a Stored Water Agreement that allows the water providers the option to reserve water stored in Timothy Lake and call for that stored water to be released certain times of the year to maximize fishery benefits from any available releases. This agreement is the process of being revised and will be tied to the new PGE FERC license. The purpose of this agreement is to give the water providers more flexibility to manage for flow variations in the lower river.

Table 1. Minimum Fish Flow Needs on the Clackamas River

Month	Flow
June 1 – September 15	650 cfs
September 16 – May 31	800 cfs

State law requires cities to create Water Management and Conservation Plans (WMCPs) and to demonstrate use without waste before additional water may be diverted out of stream. Development of the Lake Oswego and Tigard WMCPs is discussed in the next section.

4.3 WATER CONSERVATION

The cities of Lake Oswego and Tigard continue to pursue water conservation programs. In 2007, the OWRD issued a Final Order approving a WMCP for the City of Lake Oswego. With formation of the partnership between the two cities, Lake Oswego developed an update to the WMCP in January 2010. This plan update has been reviewed, and OWRD issued a Proposed Final Order in August 2010. Issuance by OWRD of a Final Order for the WMCP is pending.

Although not required to do so by Oregon statute, the City of Tigard completed its Draft WMCP in March 2010. The Tigard Draft WMCP has been reviewed by OWRD and a Final Order approving Tigard's WMCP was issued on September, 23, 2011. Both cities' WMCPs build on the success of already robust water conservation programs and guide the development, financing, and implementation of ongoing and new programs and policies to ensure sustainable use of water resources while the cities plan for their future water needs. Also, the WMCPs establish a prioritized list of current and future conservation measures and practices to meet regulatory benchmarks and self-imposed performance targets, and they guide the cities' future investments in conservation programs.

Lake Oswego and Tigard will continue to utilize a suite of programs and practices to achieve their conservation objectives of water use without waste; however, both communities realize that conservation alone cannot eliminate the need for expansion of their water supply system. These ongoing conservation programs and practices include the following:

- Conservation pricing through use of tiered pricing structures;
- Toilet/urinal rebates (residential and commercial);
- High efficiency clothes washer rebates;
- Public education;
- Water audits for residential/commercial customers;
- Give-aways (hose nozzles, faucet aerators, hose timers, toilet tank bags, and dye tablets);
- Restaurant high efficiency spray rinse nozzles;
- Landscape sprinkler system rain sensors; and
- System-wide metering, leak detection, and meter testing and replacement.

5 ALTERNATIVES (WATER SUPPLY SOURCES)

The Project Sponsors acknowledge and accept responsibility for selecting a water supply alternative that achieves the project purpose and satisfies the public's interest in maintaining and enhancing the environmental functions and values of this state and, in particular, of the Clackamas River. The following sections of this memorandum identify evaluation criteria and use them to evaluate the efficacy of water supply source alternatives to achieve the project purpose in the least environmentally damaging way possible.

5.1 EVALUATION CRITERIA

The following evaluation criteria were used to determine the feasibility of the water supply source alternatives:

- **Adequacy** – The selected alternative must ensure an adequate source of safe drinking water to supply the current and future water demands of the citizens of Lake Oswego and Tigard over the 30-year planning horizon.
- **Reliability** – The selected alternative must be sufficiently reliable to eliminate unnecessary risk of loss or damage to the two communities' supply of safe drinking water. Reliability includes the concepts of redundancy and resiliency of access to a source of supply under the control of the water users.
- **Acceptability** – The selected alternative must be acceptable to the ultimate water consumers, the residents and businesses of the cities of Lake Oswego and Tigard. For purposes of this alternative evaluation, acceptability metrics include perceived health risks, associated water quality of a source, and avoidance of excessive adverse environmental impacts. Without the support of the end water consumer, an alternative is not viable because it would not be built and another alternative would be selected.
- **Affordability** – The selected alternative must be affordable for the citizens of Lake Oswego and Tigard in difficult economic times. The affordability of an alternative will be based on a net present value analysis of capital, and operating and maintenance costs over the period of analysis (30-year project planning horizon).
- **Permitability** – The selected alternative must avoid environmental impacts if possible, minimize impacts where avoidance is not possible, and mitigate any environmental impacts through careful planning and design. The permitability criterion will also evaluate the ability to secure all necessary permits so that the project can be operational for the one-year startup and testing period beginning in summer 2015.

5.2 ALTERNATIVES CONSIDERED

The following water supply source alternatives were considered for evaluation in meeting the project purpose:

- **No Action Alternative – Clackamas Supply and Alternate Sources:** Major repair, replacement, and renewal of existing Clackamas River supply infrastructure, continued conservation programs, and reliance on alternate sources to supply demands in excess of 16 MGD. Until June 2016, the City of Tigard would continue to get its water from Portland and Tigard's Aquifer Storage and Recovery (ASR) wells. This alternative would not meet the water needs of Lake Oswego or Tigard beyond June 2016 and therefore fails the adequacy criterion.

- **Full System Expansion – Clackamas Supply (Proposed Alternative):** Construct new and expand existing supply infrastructure to allow development of Lake Oswego's Clackamas River water rights up to 38 MGD.
- **Full System Expansion – Clackamas and Willamette River Supplies:** Major repair, replacement, and renewal of existing Clackamas River supply infrastructure to continue to deliver Lake Oswego's currently certificated portion of its Clackamas River water rights (16 MGD) and apply for a new permit to appropriate an additional 22 MGD of water from the Willamette River, for a total potential diversion of 38 MGD. This alternative requires construction of a new 22 MGD intake on the Willamette River.
- **Partial System Expansion of Clackamas Intake and Expansion to Portland Source Supply:** Construct new and replace the existing Clackamas River supply infrastructure to deliver up to 24 MGD to the City of Lake Oswego. To meet its future demand of 20 MGD, the City of Tigard would need to negotiate a new long-term water supply contract with the City of Portland, construct a new supply line, and continue to use its ASR wells.

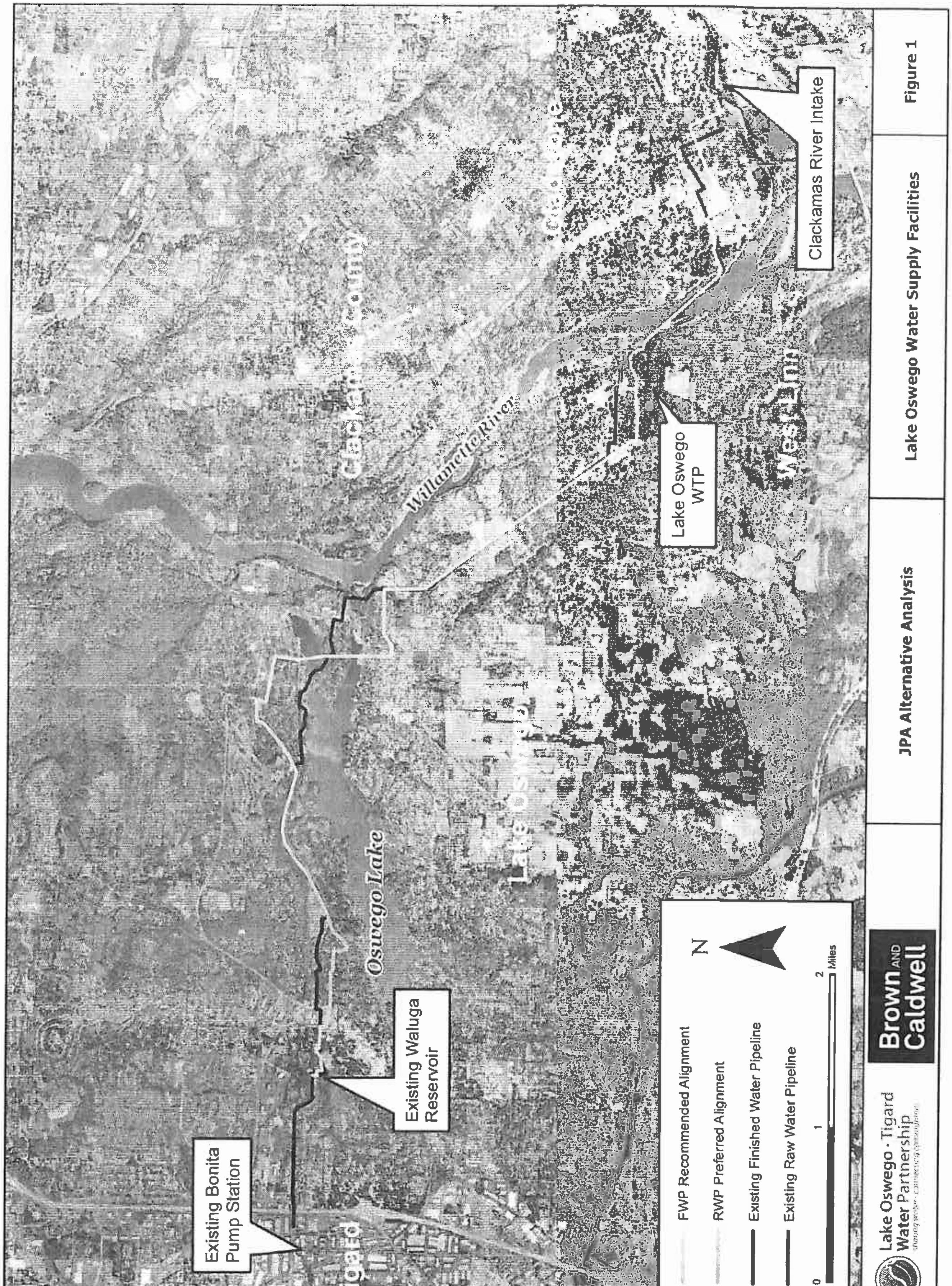
5.3 ALTERNATIVES ANALYSIS

The summary below describes the water supply source alternatives, evaluates the alternatives based on the project purpose and evaluation criteria, and provides the reasons for rejecting certain alternatives.

5.3.1 No Action Alternative

This alternative involves major repair, renewal, and replacement of existing Lake Oswego water supply system components (see Figure 1), and continuation and enhancement of water conservation programs within the Cities of Lake Oswego and Tigard. This alternative would not meet the demands of Lake Oswego or Tigard beyond June 2016 nor does it avoid impacts to the environment.

The City of Lake Oswego would need to upgrade and repair the existing River Intake Pump Station (RIPS), because its foundation is structurally unsound and the mechanical and electrical systems are becoming obsolete and unreliable, and the capacity is inadequate to meet future demands. Implementing repairs to correct these deficiencies would trigger requirements to meet current electrical and life/safety building codes and regulations that cannot be achieved within the current building envelope and structure. In addition, the Raw Water Pipeline (RWP) is more than 40 years old. Therefore, this alternative has many of the same capital costs and environmental impacts of the proposed project (see description below), including construction within the Clackamas River and along the RWP route (including the Willamette River crossing and associated riparian areas), without achieving the project purpose.



Existing Bonita Pump Station
Tigard
Existing Waluga Reservoir
Oswego Lake
Willamette River
Lake Oswego WTP
Clackamas River Intake
FWP Recommended Alignment
RWP Preferred Alignment
Existing Finished Water Pipeline
Existing Raw Water Pipeline
N
0
1
2
Miles
Lake Oswego · Tigard Water Partnership
Brown AND Caldwell
JPA Alternative Analysis
Lake Oswego Water Supply Facilities
Figure 1

The no action alternative would not meet Tigard's water demand beyond June 2016. Through June 2016, the City of Tigard would meet its average day demands of 6.4 MGD from Portland (current capacity of 6.8 MGD) and supplement its peak day demands of 13 MGD with the ASR wells (current capacity of 5.8 MGD).

Tigard's water needs are expected to increase to 20 MGD even with enhanced water conservation strategies, due to additional growth within Tigard's service area and future development of currently undeveloped lands. The no action alternative would not meet the project purpose for Tigard, because it does not meet the long-term water supply demand for Tigard for the following reasons:

- Tigard's ability to meet peak day demands from current sources of supply is near deficient.
- Portland's supply to Tigard is limited to 6.8 MGD and cannot be expanded without negotiating a long-term contract with Portland and investing in a new supply transmission system to Tigard from Portland.
- Further development of the ASR system could be attempted, but current hydrogeological information does not support successful expansion to this extent.
- The City of Portland source causes operational issues during winter refill of the Tigard ASR system. Tigard operations staff must closely monitor and manage the refill of the ASR system, having to halt refill with the Portland unfiltered source water during high turbidity periods. This results in a reduced reliability of refill of the ASR system and higher operational costs.

When evaluated against the five evaluation criteria noted above, the no action alternative was rejected because it failed to satisfy the project purpose, as follows:

- **Adequacy** – The no action alternative does not satisfy this criterion because it does not meet the long-term water supply needs of Lake Oswego and Tigard. It is not realistic to assume that both cities, for a second time in five years, would undertake a second set of costly engineering, financial, and intergovernmental studies in order to identify feasible alternative sources of water supply and that these alternative sources of supply could be developed on the same schedule as the proposed alternative. Both cities commissioned a comprehensive engineering and financial analysis of supply source alternatives in 2007, and this work resulted in a finding that the proposed alternative best meets the project purpose.
- **Reliability** – This alternative would not provide a long-term water supply for the City of Lake Oswego, because it fails to ensure a reliable supply of drinking water beyond the current demand of 16 MGD. The no action alternative is fatally flawed, because alternative sources of supply are not immediately available, and it would not be a timely process to secure appropriate intergovernmental agreements with other water suppliers. This alternative also fails to achieve the project purpose because it leaves the City of Tigard without a water source that is reliable into the future and presumes Tigard would have to secure water from other water suppliers, with no guarantee either that water would be available or that it could be purchased at a competitive cost after 2016.
- **Acceptability** – The no action alternative would not be acceptable to the end water users in either Lake Oswego or Tigard, because it would not meet future water supply demands of 24 MGD and 20 MGD, respectively. If the no action alternative were selected and implemented, there would be mandatory curtailment during the peak summer season to ensure demand is managed to the current "firm capacity" of 12 MGD. This would include curtailment of supplies to Tigard as well as other current wholesale customers of Lake Oswego.

- **Affordability** – The net present value cost for the no action alternative for the cities of Lake Oswego and Tigard was not developed, because the no action alternative would not meet the project purpose for either city.
- **Permitability** – The no action alternative would likely be permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented.

5.3.2 Full System Expansion - Clackamas Intake (Proposed Alternative)

The Full System Expansion – Clackamas Intake is the proposed alternative. This alternative would expand the current Lake Oswego and Tigard water supply facilities to accommodate the existing and future needs of both the City of Lake Oswego (24 MGD) and the City of Tigard (20 MGD), utilizing Lake Oswego's senior and junior water rights on the Clackamas River of 38 MGD. The City of Tigard will also use its ASR system as a supplemental supply source. The proposed ASR system would provide a supplemental capacity of 5.8 MGD that would be used during times of seasonal peak demand.

The proposed alternative is anticipated to include the following primary elements:

- New River Intake Pump Station (RIPS)
- New Raw Water Pipeline (RWP)
- Expansion and upgrades to the Water Treatment Plant (WTP)
- New Finished Water Pipeline (FWP)
- A second reservoir at the Waluga Reservoir Site to provide additional storage capacity (WR2)
- New Bonita Pump Station (BPS)

This alternative best satisfies the project purpose and objectives and:

- Implements improvements to Lake Oswego's existing RIPS, RWP, and WTP that would be necessary even without the project;
- Creates opportunities for new or upsized interconnections to other regional sources of supply, increasing reliability and providing a backup water source;
- There will be a negligible reduction in the water surface elevation in this reach of the Clackamas River due to the increased Lake Oswego – Tigard withdrawal from 16 MGD to 38 MGD (less than 1/10 of a foot during the 95 percentile exceedance flow);
- Is the lowest life-cycle cost option for the City of Lake Oswego and for the City of Tigard; and
- Assures the City of Tigard an ownership interest in supply facilities and a reliable long-term source of water.

When evaluated against the five evaluation criteria noted above, this alternative was selected because it best satisfies the project purpose, as follows:

- **Adequacy** – This alternative would meet the needs of the City of Lake Oswego and the City of Tigard for a safe drinking water supply based on anticipated current need and future growth for the 30-year planning horizon.

- **Reliability** – This alternative provides Tigard an ownership share in its water supply, and also provides the potential for redundancy through future access to alternative supply sources, if and when they are identified and determined feasible.
- **Acceptability** – This alternative meets the project purpose of providing access to an excellent source of high quality raw water and new infrastructure that replaces unreliable and obsolete facilities at the lowest net present value of all alternatives evaluated.
- **Affordability** – The 30-year Net Present Value (NPV) costs were developed for all of the water source alternatives, with the exception of the no action alternative. The Full Expansion Alternative - Clackamas Intake (proposed alternative) has the lowest 30-year NPV cost, by nearly $50 million, for both the City of Lake Oswego and the City of Tigard (see Table 2).

Table 2. Water Supply Source Alternatives: 30-year Net Present Value (NPV) Cost

Table 2. Water Supply Source Alternatives: 30-year Net Present Value (NPV) Cost			
Alternative	**Lake Oswego NPV Cost**	**Tigard NPV Cost**	**Combined NPV Cost**
No Action	N/A	N/A	N/A
Full Expansion – Clackamas R.	$168,000,000	$179,000,000	$347,000,000
Full Expansion – Willamette R.	$191,000,000	$205,000,000	$396,000,000
Partial Expansion	$243,000,000	$446,000,000	$689,000,000

- **Permitability** – This alternative would complete an existing permitted use of a high quality source of drinking water for Lake Oswego and Tigard that has long been contemplated by the original water rights permits acquired by Lake Oswego. The public's interest in further development of the City of Lake Oswego's water rights permits was recently tested using contemporary standards of review, and this alternative was found to uphold the highest and best use water policy of Oregon. As part of the water rights permit process, the Oregon Department of Fish and Wildlife (ODFW) advised the OWRD concerning the conditions that would allow Lake Oswego to meet its water supply needs while maintaining the persistence of listed fish species. ODFW's fish persistence advice for Lake Oswego's undeveloped water rights was based on the best available information and existing data and recommends the stream flows for maintaining the persistence of listed fish species. Based on these stipulated water withdrawal conditions in the Final Order for the water rights permit extension, this alternative would maintain the persistence of listed fish species and have negligible impact on water levels of the Clackamas River.

  This alternative is permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented, because it minimizes environmental impacts and can be completely operational by June 30, 2016.

5.3.3 Full System Expansion – Clackamas and Willamette Intakes

Under this alternative, major repair, replacement, and renewal of existing Clackamas River supply infrastructure would be required to continue to reliably deliver the City of Lake Oswego's certificated portion of its Clackamas River water rights (16 MGD). These improvements would be the same as those described in the no action alternative for Lake Oswego. To meet the demands of both cities, a new water right to divert an additional 22 MGD would be required for the Willamette

River. After a new water right permit is acquired, the cities would construct a new 22 MGD RIPS on the west bank of the Willamette River at a point of diversion that is not yet known.

When evaluated against the criteria noted above, the Clackamas and Willamette Intakes alternative was rejected, because it failed to satisfy the project purpose, as follows:

- **Adequacy** – Subject to acquisition of a new permit to divert 22 MGD from the Willamette River, acquisition of state-owned property to site a new 22 MGD intake on the west bank of the Willamette River, and public acceptance, this alternative could provide an adequate supply of raw water for treatment and supply to citizens of Lake Oswego and Tigard and their respective wholesale customers.
- **Reliability** – This alternative could provide a reliable source of water for both cities.
- **Acceptability** – This alternative would be rejected by the citizens of both Lake Oswego and Tigard. Lake Oswego currently enjoys and has long-standing water rights to drinking water from the Clackamas River, an excellent source of high quality water. It is highly likely that Lake Oswego residents would reject receiving a portion of their water supply from the Willamette River. The City of Tigard currently has a co-owned water right on the Willamette River; however, Section 51 of Tigard's City Charter includes a restriction established by a vote of the citizens in 1999 that prohibits use of the Willamette as a source of drinking water without a city-wide vote. Moreover, the necessary new development on the banks of the Willamette River would not be seen as an appropriate and necessary environmental impact by the citizens of both communities.
- **Affordability** – The 30-year NPV cost for this alternative was almost $50 million more than the 30-year NPV cost for the proposed alternative (see Table 2).

  Additional costs for this alternative would result from:

  - Land acquisition costs for a new intake structure;
  - Costs associated with land use approvals for a new intake structure;
  - Costs associated with water rights permit acquisition;
  - Lost revenue from wholesale customers choosing to terminate existing agreements with Lake Oswego and Tigard due to negative public perception related to the Willamette River;
  - Costs to Tigard associated with a multi-year extension of water purchase agreements with the City of Portland until this option could be approved and constructed; and
  - Costs associated with attempting to overcome negative public reaction to developing the Willamette River for a drinking water supply (e.g., delays for studies and debates and use of more expensive treatment technology to address perceived public health risks from this water source).
- **Permitability** – This alternative would not avoid any of the environmental impacts of the proposed alternative but would increase environmental impacts by introducing a new water withdrawal and installing a new intake facility on the west bank of the Willamette River. Additional water rights would need to be acquired for the Willamette River. The administrative process required to acquire a permit for diverting waters of the State takes a substantial amount of time, and there is no certainty of approval. To undertake this effort now would impose significant schedule and cost risk to the Project Sponsors and would most certainly delay the project past the expiration of Tigard's water contract with the City of Portland in 2016.

Additionally, land would need to be acquired from the State of Oregon in order to site a new RIPS. If the Willamette RIPS facility is sited in Mary S. Young Park, an Oregon State Park operated by the City of West Linn, the type of facility would violate certain land use restrictions. In order to mitigate the use of park property for construction of the new Willamette RIPS, land would also need to be acquired to replace the acquired park parcel with an equivalent parcel for park purposes.

5.3.4 Partial System Expansion of Clackamas Intake, and Contract and Expand Portland Source

This "go it alone" alternative would include partial expansion of the existing Clackamas River supply infrastructure to meet Lake Oswego's 24 MGD demand and the negotiation of a long-term water supply contract with the City of Portland to meet Tigard's demand of 20 MGD. It should be noted that this alternative does not support a move toward regional water supply planning because Lake Oswego and Tigard would not be working together for their long-term water supplies.

The City of Lake Oswego would construct a new RIPS on the Clackamas River, a raw water pipeline, a treatment plant, and a finished water pipeline and reservoir, with an ultimate build-out capacity of 24 MGD. This alternative would fulfill the City of Lake Oswego's projected supply needs; however, this is Lake Oswego's most expensive alternative, because none of the capital or long-term operations and maintenance costs would be shared with Tigard.

The City of Tigard would be required to obtain its municipal water supply from other sources, the most likely of which is the City of Portland. Tigard's water needs are expected to increase to 20 MGD even with the water conservation strategies in place and planned for the future. The City of Tigard would need to negotiate a long-term water supply contract with the City of Portland and construct a new supply line and associated pumping system improvements. At a minimum, the new supply line would be approximately 11 miles long and run between Willamette Park and Tigard's 10 million gallon terminal reservoir. Tigard would also continue to use its ASR system for peak day seasonal demand. As discussed in the No Action alternative, the City of Portland source would cause operational issues during winter refill of the Tigard ASR system. Tigard operations staff would need to closely monitor and manage the refill of the ASR system, having to halt refill with the Portland unfiltered source water during high turbidity periods. This would result in reduced reliability of refill of the ASR system and higher operational costs.

When evaluated against the criteria, this alternative was rejected because it does not achieve the project purpose, as follows:

- **Adequacy** – While this alternative could provide Lake Oswego and Tigard with an adequate supply of drinking water, it does not support regional water supply planning and development on a multi-community basis.
- **Affordability** – This is both cities' most expensive alternative, with the 30-year NPV cost being almost twice that of the proposed alternative (Table 1). The NPV cost for this alternative includes partial expansion and operation of the Lake Oswego water supply facilities, construction of the new Portland supply line and associated pumping system improvement, and projected water rates that Tigard would pay to the City of Portland. The projected Tigard water rates are based on the Portland Water Bureau's Fiscal Year 2011-12 Five-Year Preliminary Financial Plan dated January 2011.

- **Acceptability** – Beyond affordability, this alternative could meet the desire of the citizens of the two communities for a high quality water source, since it does not rely on the Willamette River. However, it may be seen as unacceptable to the citizens of Lake Oswego because it jeopardizes the further development of Lake Oswego's remaining undeveloped water rights beyond 24 MGD. It would be unacceptable to the citizens of Tigard because it forces those citizens to continue purchasing water on a contract basis and therefore not achieve control over future costs. Additionally, this alternative would not fulfill a regional regulatory agency desire to move toward regional water supply planning.
- **Reliability** – Although this alternative would be reliable for the City of Lake Oswego, it would mean that Tigard would continue to purchase water from Portland or other suppliers, with no guarantee that the water would be supplied at a cost equivalent to the proposed alternative or at all.
- **Permitability** – This alternative would likely be permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented.

6 ALTERNATIVES (PROJECT DESIGN/LOCATION/ ALIGNMENT)

The river intake design and location, and pipeline alignments for the proposed project will be developed to avoid, where possible, and otherwise minimize impacts to fisheries, waterways, and wetlands. The proposed project's fishery, waterway, and wetland impacts occur at the RIPS, the RWP, and the FWP. No fishery, waterway, or wetland impacts are anticipated at the water treatment plant or the WR2. The intake design and location and pipeline alignments of the alternatives were the focus of alternative evaluations and impact avoidance strategies.

6.1 EVALUATION CRITERIA

The following evaluation criteria were used to determine the feasibility of alternative intake designs and locations and the alternative pipeline alignments:

- **Acceptability** – The selected intake design and location and the pipeline alignments not only must be acceptable to the ultimate water consumers but also must provide the least amount of disturbance to the communities where the intake and pipelines are being constructed.
- **Affordability** – The selected alternative must be affordable for the citizens of Lake Oswego and Tigard. The affordability of an alternative will be based on a comparison of NPV costs for both capital and operating and maintenance costs over the 30-year period of analysis.
- **Permitability** – The selected intake designs and locations and pipeline alignments must avoid environmental impacts if possible, minimize them where avoidance is not possible, and mitigate them through careful planning and design, and through the various permitting processes, secure all necessary permits so that the project can be operational for the one-year startup and testing period beginning in summer 2015.

The evaluation criteria of adequacy and reliability were not used to evaluate design, location, or alignment alternatives, because those two evaluation criteria pertain specifically to the feasibility of the alternative water supply sources. Design, location, and alignment alternatives were considered only for the proposed alternative—Full System Expansion – Clackamas Intake.

6.2 ALTERNATIVES CONSIDERED

The following alternatives were also considered for evaluation in meeting the project purpose:

- Evaluation of alternative intake locations and intake screening designs;
- Evaluation of open excavation versus trenchless construction for major water body crossings; and
- Evaluation of constructing around versus through wetlands.

6.3 RIPS LOCATION ALTERNATIVES ANALYSIS

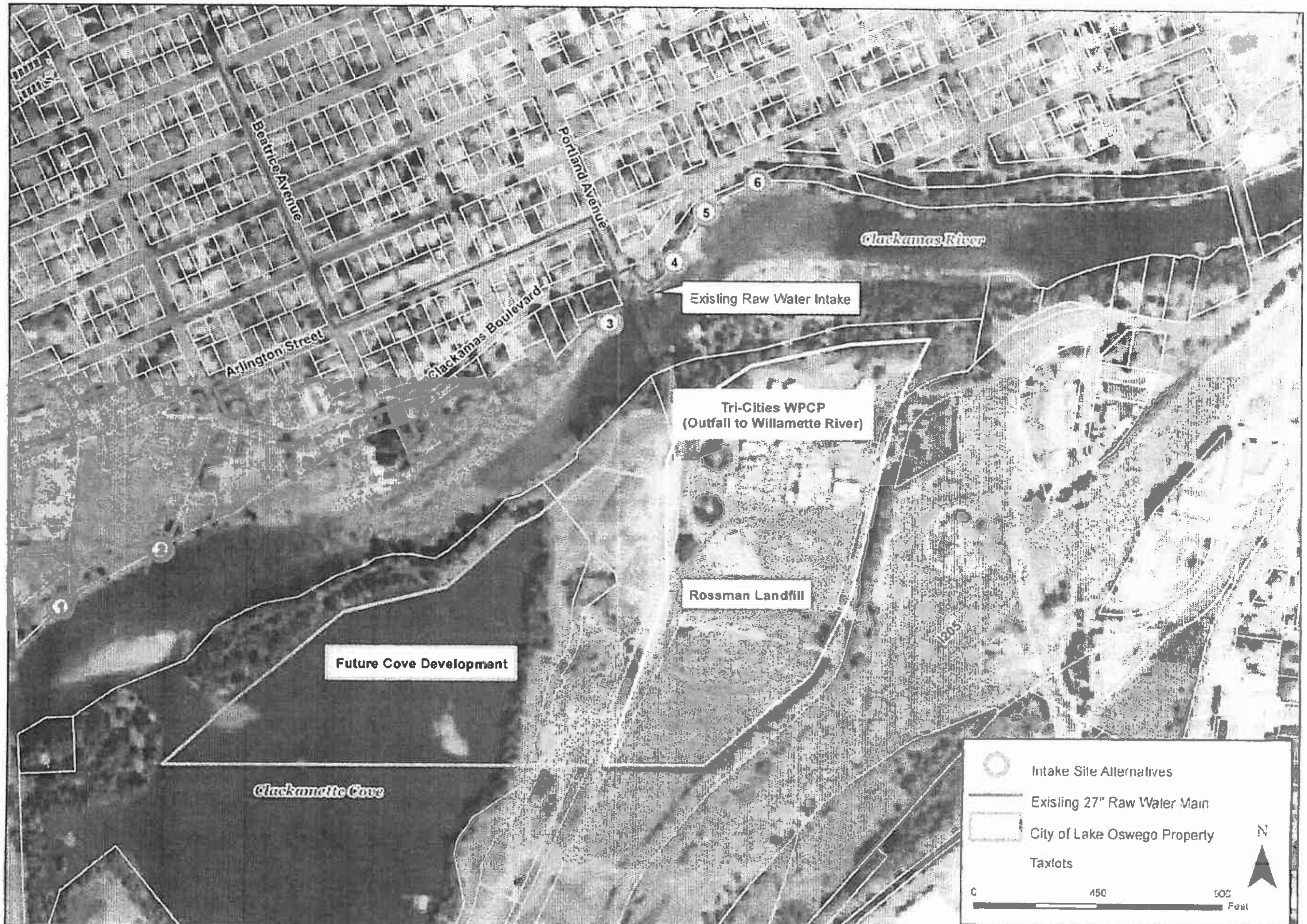
The existing RIPS facility draws raw water from the Clackamas River and pumps it to the Lake Oswego WTP for treatment. The proposed RIPS facility design would accommodate the combined senior and junior water rights of 38 MGD. Alternative intake locations were the focus of the evaluations and impact avoidance strategies. The existing RIPS is located at River Mile 0.8 on the right bank of the Clackamas River. The existing site and other locations both upstream and downstream were evaluated to determine the most favorable location for the new RIPS. The six locations identified for evaluation are shown in Figure 2. The key factors considered in the development of the alternative locations for the RIPS were the following:

- Water quality issues;
- Location (point of withdrawal) of existing water rights;
- Riverbed/riverbank stability;
- River bathymetry relative to proper pump submergence;
- Operations and maintenance (O&M) access;
- Fish considerations, including sweeping velocity and permitting;
- Utility access;
- Potential for issues related to river debris;
- Constructability;
- Location relative to 100-year floodplain;
- Access bridge length;
- Access road pipe alignment;
- Impediments to Clackamas River recreation; and
- Land use and property ownership.

6.3.1 RIPS Downstream Alternatives (Sites 1, 2, and 3)

Sites 1 and 2 are undesirable because of potentially unstable river conditions, potentially lower water quality, difficult utility access, exposure to large debris in the river, and the impact on recreational activity on the river.

A potential water quality concern for the downstream alternatives (Sites 1 and 2) is the influence from the Rossman Landfill and nearby upstream storm drainage discharges.



Lake Oswego · Tigard Water Partnership
sharing water connecting communities

Brown AND Caldwell

JPA Alternative Analysis	River Intake Pump Station Site Alternatives	Figure 2

The Rossman Landfill is located just south of the Tri-City Water Pollution Control Plant on the south side of the Clackamas River, upstream of potential intake Sites 1 and 2 and the Clackamette Cove, which is located on the south side of the Clackamas River, downstream of the existing RIPS and upstream of the Highway 99E Bridge. The remedial action plan for the Rossman Landfill was designed so that the leachate from the landfill would not result in any exceedance of drinking water maximum contaminant levels (MCLs) in the Clackamette Cove, as discussed in *Remedial Action Work Plan: Unpermitted Rossman Landfill* report completed by URS Corporation in 2000. However, another study would need to be completed to confirm that water quality in the Clackamas River is not affected by landfill leachate at the downstream sites being considered.

Storm drain and combined sewer outfalls also pose a water quality concern for the downstream sites. A 54-inch-diameter storm drain outfall is located just upstream of the potential downstream sites. Water quality is not monitored at this outfall. Data from other outfalls in the area are available and indicate that constituents typical of storm drainage are discharged to the Clackamas River upstream of potential intake sites 1 and 2.

Site 3 was removed from consideration due to difficult construction access and the need to purchase adjoining residential property and existing homes to accommodate construction and permanent access.

6.3.2 RIPS Upstream Alternatives (Sites 5 and 6)

The upstream Sites 5 and 6 were found undesirable because of poor intake pool characteristics, difficult crane access for maintenance activities, exposure to debris in the river, and long access bridge length. These upstream sites are also located adjacent to City of Gladstone public park lands that are zoned for open space use, which would make it difficult to obtain property easements or acquisitions for a new RIPS facility. For these reasons, Sites 5 and 6 were removed from further consideration.

6.3.3 RIPS Existing Site (Site 4)

The existing site was found to be most favorable with respect to the evaluation criteria. The water rights are located at this point of diversion and moving the RIPS to another more distant location would require moving the point of diversion. The river pool at this location is sufficiently deep and has stable geophysical conditions, as evidenced by its 41-year history for the existing intake. A challenge with the existing site is fish screen sweeping velocity. The existing intake and associated fish screen are located away from the main river current in a backwater area, which currently results in eddy currents and upstream flow velocity at low river levels. In order to maintain future fish screen downstream sweeping velocity that is greater than the approach velocity and optimally between 0.8 and 3.0 feet per second (fps) (National Marine Fisheries Service guideline) for the proposed RIPS at this location, either the use of mechanically-induced sweeping velocity or redirection of the river current across the front of the intake via upstream channeling changes may be required.

6.3.4 Site Evaluation and Selection

While considering the attributes of the sites as described above, the sites were evaluated using the criteria. The existing site (Site 4) rated most favorable with respect to the criteria and was selected for the new RIPS location. The evaluation of the sites according to the criteria was as follows:

- **Acceptability** – Influence from the existing Rossman Landfill and nearby upstream storm drains is a potential water quality concern for the downstream Sites 1 and 2. The upstream Sites 5 and 6 were determined to be undesirable due to poor intake pool characteristics, difficulty of access for maintenance activities, exposure to debris in the river, long access distances from the river bank, and land use issues.
- **Affordability** – Site 3 was removed from consideration because of difficult construction access and the need to purchase adjoining residential property and existing homes to accommodate construction and permanent access. Sites 1, 2, 3, 5, and 6 would be more costly than Site 4 as a result of land acquisition needs and more challenging site conditions.
- **Permitability** – Sites 5 and 6 would move the intake upstream, which in turn would require the existing water right point of diversion to be moved. This would require additional water rights permitting for Sites 5 and 6, delaying the operational date of the project well beyond 2016. Sites 1, 2, 3, and 4 could secure all necessary permits so that the project can be operational for the one-year startup and testing period beginning in summer 2015.

6.4 INTAKE SCREEN ALTERNATIVES ANALYSIS

Design of the intake included selecting screens and screen cleaning systems with features to address the design criteria and guidelines of the fisheries agencies. Screen alternatives were evaluated based upon the NMFS Anadromous Salmonid Passage Facility Design guidelines, July 2011; the primary criteria for intake fish screen design are the following:

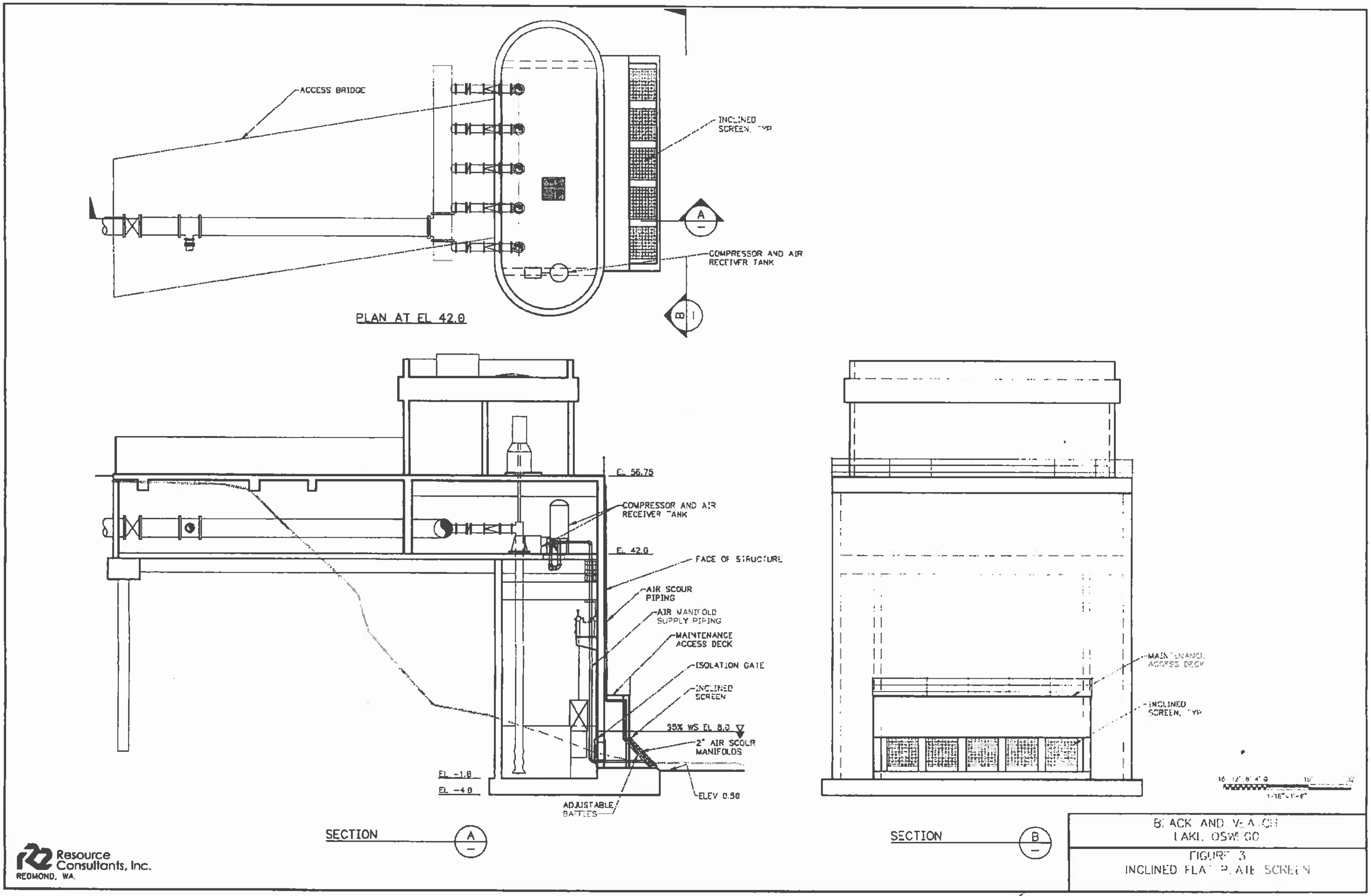
- Maximum screen approach velocity of 0.4 feet per second (fps);
- Open space between bars should be 1.75 millimeters or less;
- Sweeping velocity, the water velocity across the screen, greater than approach velocity and optimally between 0.8 and 3.0 fps; and
- Automatic screen cleaning system to clean the screens on detection of headloss across the screens and on an automatic, timed cycle with the ability for complete debris removal at least every 5 minutes.

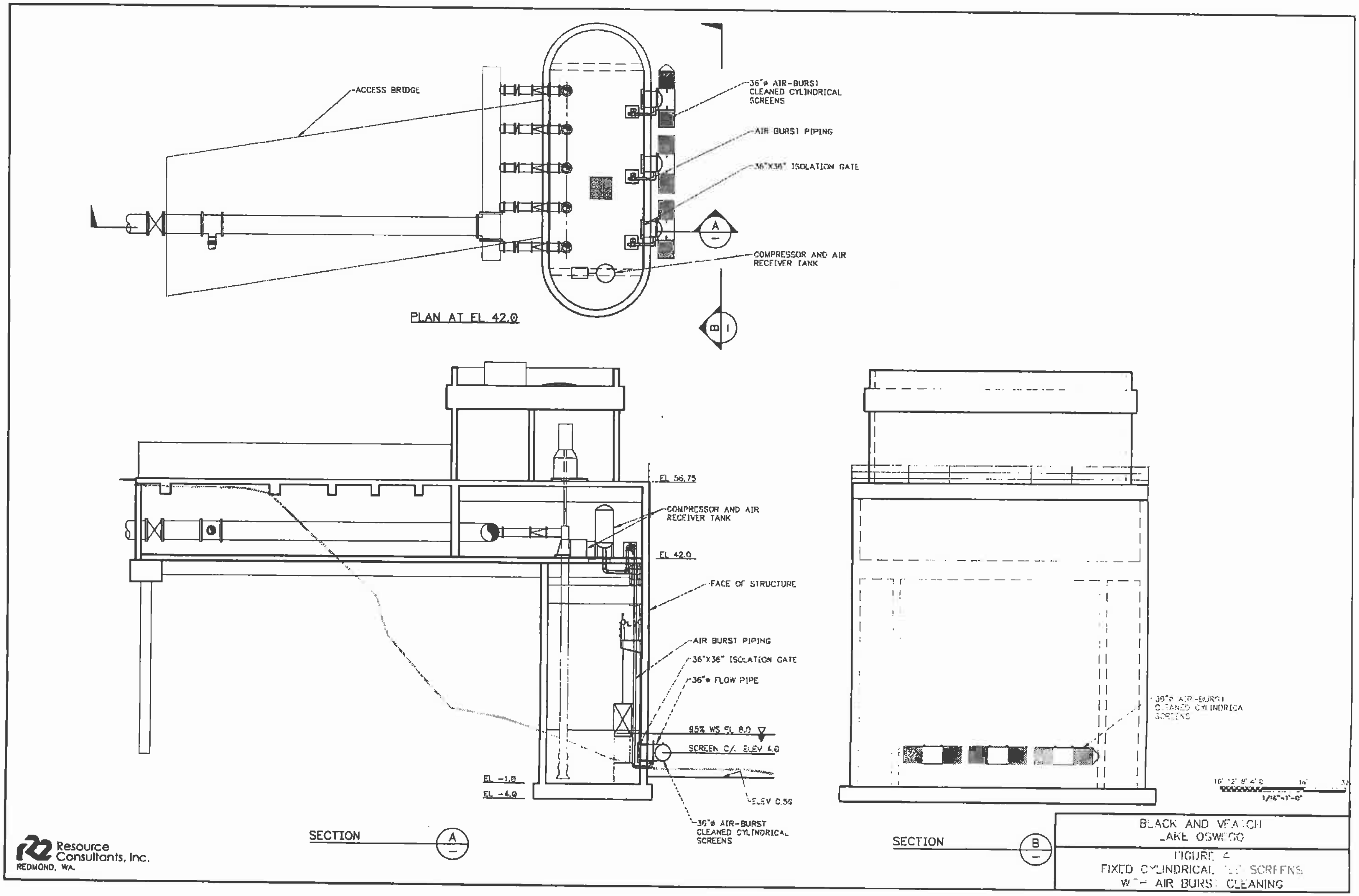
6.4.1 Preliminary Intake Screen Alternatives Considered

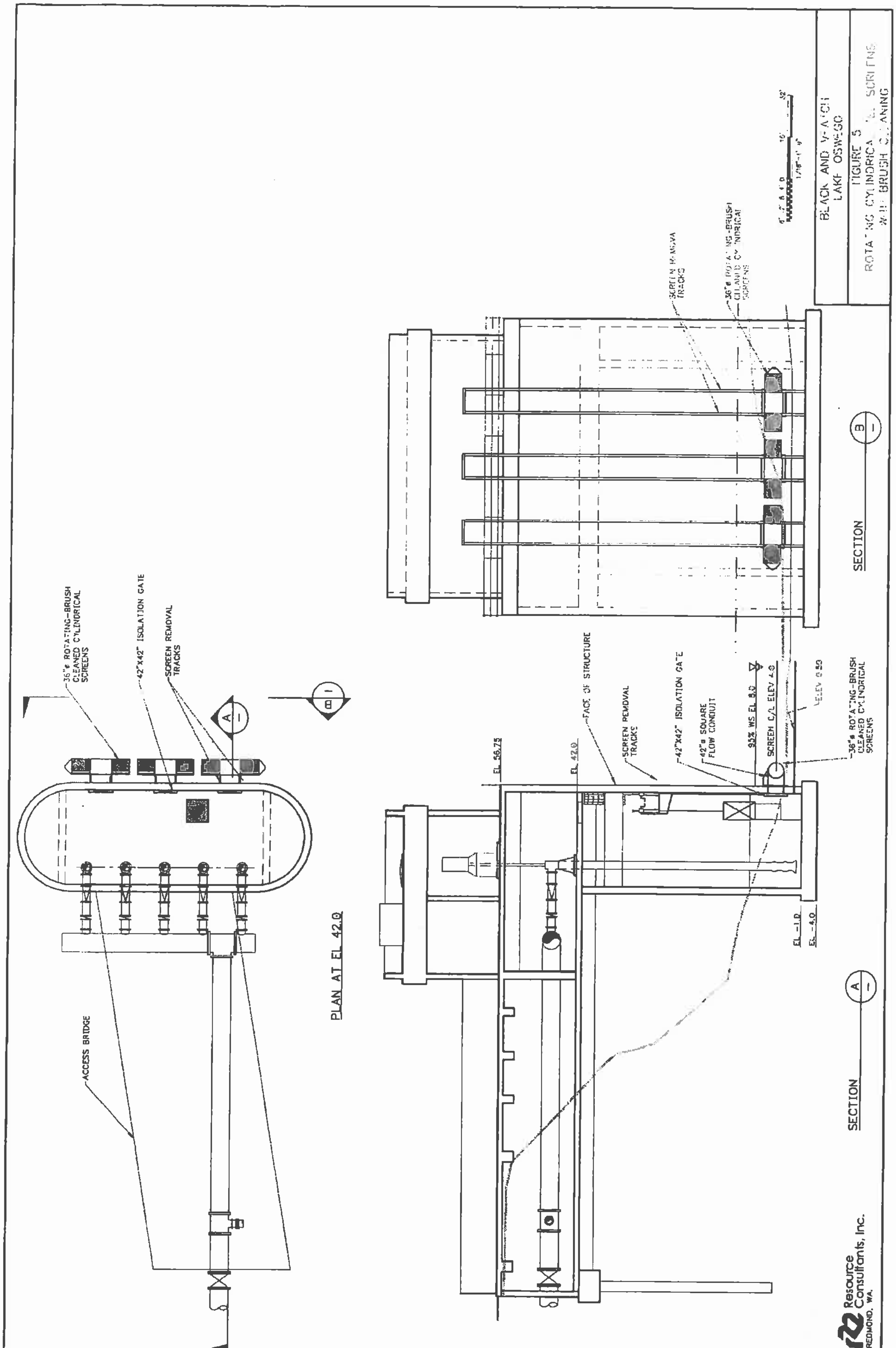
The following intake screens were initially considered for use at the new RIPS:

- Fixed vertical plate screens with water-jet cleaning;
- Fixed inclined plate screens with water-jet cleaning;
- Cylindrical fixed tee screens;
- Rotating cylindrical tee screens;
- Fixed cone screens;
- Vertical traveling screens; and
- Horizontal bar or plate screens.

The preliminary evaluation considered site-specific conditions, agency guidelines, constraints, and review of similar intakes on the Clackamas River. Fixed inclined plate screens, cylindrical fixed tee screens and rotating cylindrical tee screens were selected for further evaluation. Fixed cone screens were rejected because they offer no advantage over cylindrical fixed tee screens for this application.


ACCESS BRIDGE
INCLINED SCREEN, TYP
COMPRESSOR AND AIR RECEIVER TANK
PLAN AT EL 42.0
EL 56.75
COMPRESSOR AND AIR RECEIVER TANK
EL 42.0
FACE OF STRUCTURE
AIR SCOUR PIPING
AIR MANIFOLD SUPPLY PIPING
MAINTENANCE ACCESS DECK
ISOLATION GATE
INCLINED SCREEN
35% WS EL 8.0
2" AIR SCOUR MANIFOLDS
EL -1.8
EL -4.0
ELEV 0.50
ADJUSTABLE BAFFLES
SECTION A
SECTION B
INCLINED SCREEN, TYP
Resource Consultants, Inc.
REDMOND, WA.


ACCESS BRIDGE
36"ø AIR-BURST CLEANED CYLINDRICAL SCREENS
AIR BURST PIPING
36"X36" ISOLATION GATE
COMPRESSOR AND AIR RECEIVER TANK
PLAN AT EL 42.0
EL 56.75
COMPRESSOR AND AIR RECEIVER TANK
EL 42.0
FACE OF STRUCTURE
AIR BURST PIPING
36"X36" ISOLATION GATE
36"ø FLOW PIPE
95% WS EL 8.0
SCREEN C/L ELEV 4.0
EL -1.8
EL -4.0
ELEV 0.56
36"ø AIR-BURST CLEANED CYLINDRICAL SCREENS
SECTION
A
SECTION
B
Resource Consultants, Inc.
REDMOND, WA.
FIGURE 4
WITH AIR BURST CLEANING


36"ø ROTATING-BRUSH CLEANED CYLINDRICAL SCREENS
42"X42" ISOLATION GATE
SCREEN REMOVAL TRACKS
ACCESS BRIDGE
PLAN AT EL 42.0
EL 56.75
EL 42.0
FACE OF STRUCTURE
SCREEN REMOVAL TRACKS
42"X42" ISOLATION GATE
42"ø SQUARE FLOW CONDUIT
95% WS EL 8.0
SCREEN C/L ELEV 4.0
36"ø ROTATING-BRUSH CLEANED CYLINDRICAL SCREENS
EL -1.0
EL -4.0
SECTION
SECTION
BLACK AND
LAKE OSWEGO
FIGURE 5
Resource Consultants, Inc.
REDMOND, WA.

The cylindrical screens would be positioned with the screens away from any local hydraulic impacts from the side wall of the structure, and place the screens out into a better river flow sweeping velocity. The layout places the screens 18 inches clear off the face of the intake structure. No lower access deck would be required with the tee screens because the cylindrical shape of the screens do not lend themselves to manual cleaning from above, and the baffling and air burst piping are both internal to the screen drums and do not need adjustment.

The major advantages of this alternative over inclined flat plate screen alternative, in addition to the reduced cost, are the location of the screens away from the face of the structure, the potential for improved cleaning over an air scour system, and the relative simplicity of the cleaning system. The air burst system in a tee screen takes advantage of the confined, remote nature of the screen drum, as opposed to a flat screen integrally connected to the pump chamber, and fills the screen drum with 2 to 3 times the screen drum volume with pressurized air over a period of 3 to 4 seconds. This violent discharge of air through the screen dislodges debris impinged on the screen. The three screens are cleaned sequentially, from upstream to downstream, so that debris from an upstream screen will not accumulate for a prolonged period of time on a downstream screen. Even so, an air burst cleaning may be less than completely effective at dislodging items actually attached to the screen such as heavy algae accumulation, although likely more effective than the air scour system. This is because the air cleaning does not mechanically brush or scrape debris off the screen.

Disadvantages of the air burst tee screen include the inability to access the screens for maintenance or inspection without divers (including any physical removal of algae mats), the potential for boats to impact the screens during periods of low water level, and potential danger to boats or people in the water in the vicinity of the screens during a burst cleaning. The violent discharge of air from the tee screen during a cleaning cycle can capsize or even sink a boat if it is too close to the screen. It is advised that this alternative include some form of physical restriction or cautionary signage to boats in the near vicinity of the RIPS.

Air burst tee screens are fabricated by the Hendrick Screen Company and other manufacturers and are in use at numerous facilities around the country. The screens have been approved by NMFS for use on pump stations, and other small magnitude flow diversions, for the protection of fish and are referred to as end-of-pipe screens in the NMFS Anadromous Salmonid Passage Facility Design guidelines issued in July 2011. In fact, air burst tee screens are currently in use for fish protection on the Clackamas River. Three tee screens are located on the pumped attraction water intake for the fish ladder at River Mill Dam in Estacada, and a tee screen is located on the Clackamas River Water intake in Clackamas.

6.4.2.3 Rotating Cylindrical Tee Screens with Brush Cleaning

The brush cleaned rotating cylindrical tee screen, shown on Figure 5, is an alternative that offers some distinct advantages over both of the fixed inclined flat plate screen and the fixed cylindrical tee screen with air burst cleaning. Perhaps most significant is the physical removal of debris from the screen, even adhered material such as algae. Of all available means of cleaning screens, physically brushing the screen is the most effective means of removing accumulations of algae. The general arrangement of the RIPS structure and the brush cleaned tee screens is identical to that described for the air burst cylindrical tee screens with three significant differences.

First, rather than an air compressor, receiving tank, air distribution controls, and a series of air pipes running down to the tee screens a submersible motor is located inside the central manifold of each tee screen. Second, the brush-cleaned tee screens are designed to discharge into a larger rectangular central discharge conduit resulting in lower velocity flow entering the pump station. Finally, each tee screen is mounted on tracks so that they can be individually raised up to the level of the upper deck for maintenance and inspection, eliminating the need for divers. The brush-cleaned tee screens are manufactured by Intake Screens, Inc. (ISI), and the installation with tracks for removing and installing the screens is their standard design. Although it may be possible to design an air burst tee screen mounted on tracks, Hendrick Screen Company has never done this so it would have to be a custom design and would likely add significant cost and some level of complication to the design.

The ISI tee screens have a fixed strip brush on the outside of the drum and a rotating cylindrical brush on the inside. When a cleaning cycle is called for the screen drum is rotated past the brushes several turns in both clockwise and counterclockwise directions, effectively removing debris, and more significantly algae, from both sides of the screen. In the case of algae, the mechanical action of brushing the screen face has the added benefit of breaking up some of the algae into small enough pieces that they simply pass through the screen in the pump flow and are eliminated from the potential for future re-accumulation on the screen or downstream screens. The brush cleaning also has the advantage of the potential for near continuous cleaning (well below a 5 minute cycle) if conditions require. Air cleaning typically is limited to bursts on a cycle of 15 to 30 minutes.

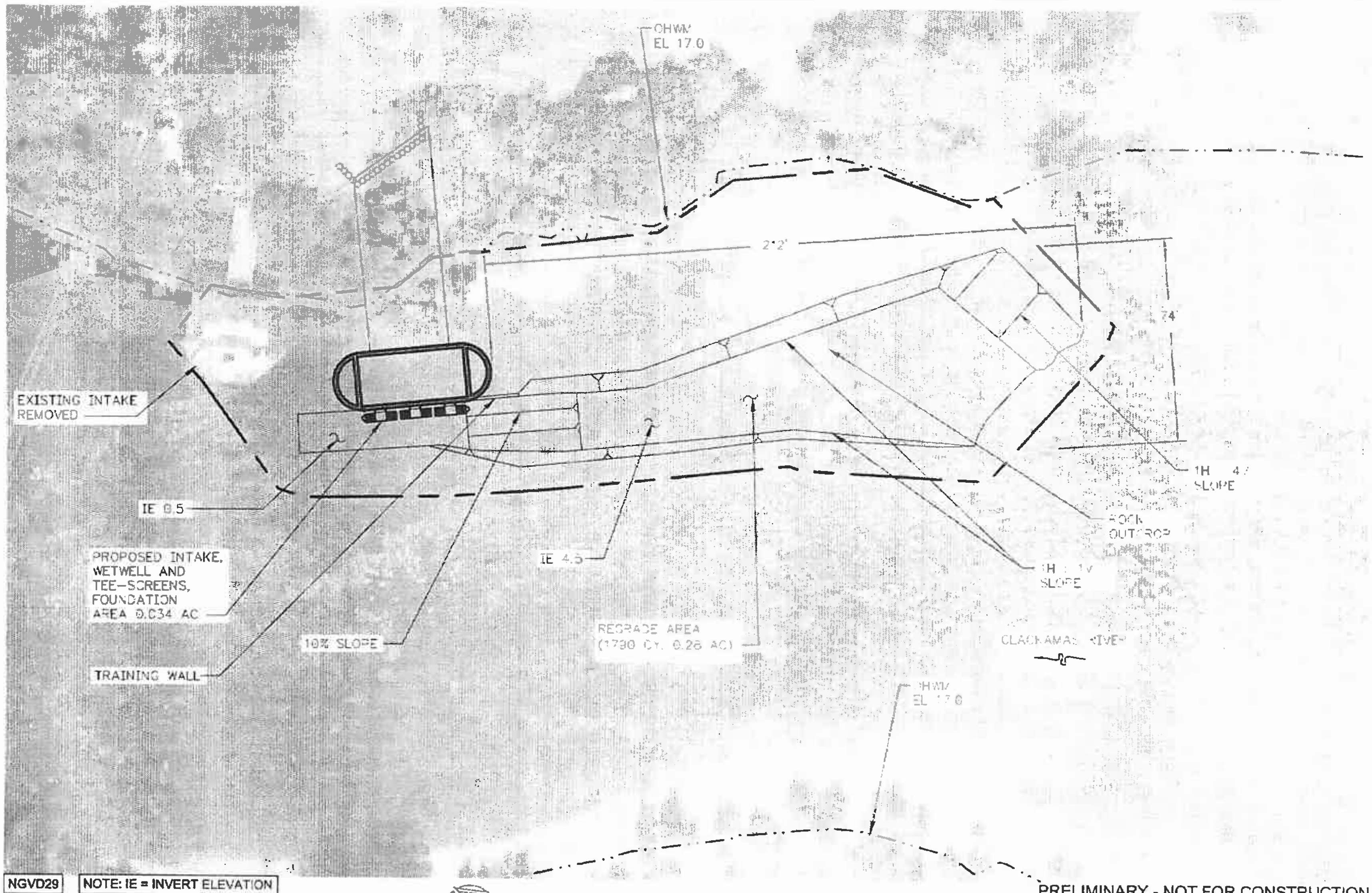
This alternative does have a significantly higher initial cost, mostly due to the track assembly for raising and lowering the screens, but the advantages of providing the most effective cleaning system and the ability to do inspections and maintenance in the dry may outweigh the higher initial cost over time.

6.4.3 River Channel Modifications to Improve Sweeping Velocity at the Intake

Under current conditions an eddy occurs at the intake resulting in poor sweeping velocity across the intake fish screens. To improve flow conditions across the screens a channel would be excavated parallel to the river bank upstream of the intake screens. The proposed channel, shown on Figure 6, will require excavation of approximately 1500 cubic yards of rock. The rock would be removed to create a strait upstream of the screens that would breach the rock outcrop and funnel the flow toward the screens. This strait is wider at the upstream end and maintains a constant elevation of 4.5 at the invert until it approaches the intake structure. Near the structure the invert slopes down at a 10% slope to an elevation of 0.5 feet below the screens. The channel walls are typically at a 1 foot horizontal to 1 foot vertical slope. A training wall is included just upstream of the intake on the right side of the channel to transition to the vertical intake wall. This wall has a top elevation of 10.0 feet. The upstream end of the channel transitions into the river bank at a 4 foot horizontal to 1 foot vertical slope.

The configuration of this channel results in a submerged ridge of rock between the proposed channel and the existing thalweg of the river. This ridge tends to direct the flow entering at the upstream end toward the screens and improve the sweeping velocity across the screens. This ridge also leaves a raised area to place gravel bags for cofferdams for isolating the area during construction.

With this channel configuration the sweeping velocity at the screen is estimated at 0.5 fps for the 95 percent exceedance condition for river flow. This sweeping velocity exceeds the approach velocity of the screen. Sweeping velocity is a particular concern when juvenile fish are present. The juvenile fish out migration period tends to peak from April to June. During this time frame the 95% exceedance flow is between 1000 and 2000 cfs. The area in the vicinity of the intake is scoured rock



NORTH

OVERALL SITE PLAN

WARNING

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

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Building a world of difference.
Black & Veatch Corporation

LOTWP
RIPS
JPA ALTERNATIVE ANALYSIS
SITE PLAN - RIPS AND CHANNELIZATION

FIGURE 6 | 0

and offers poor juvenile fish rearing conditions and it is unlikely that significant numbers of juvenile fish will be present near the screen during period other than the juvenile out migration. A design approach velocity of 0.3 fps is proposed to; insure compliance when using fixed baffled screens, better protect fish, better avoid debris clogging on the screens, and insure that the sweeping velocity will exceed the approach velocity. By removing rock upstream of the screen near to the right bank, a sweeping velocity of at least 1.0 fps can be achieved during the juvenile fish out migration season. The configuration of the screens adjacent to a large pool in the river results in conditions that allow fish ample freedom of movement around the screens by not confining fish in a structure close to the screens and avoiding the need for a fish bypass.

The proposed rock removal to create the channel near the right bank will greatly benefit sweeping conditions at the intake, and achieve sweeping velocity that equals or exceeds the approach velocity at the proposed screens under all low flow conditions. The individual screen lengths are relatively short and fish are not confined near the screens during operation. Providing consistent downstream sweeping velocity, as opposed to an upstream eddy flow, should be adequate to move fish downstream and away from the screens.

6.4.4 Intake Screen Arrangements Considered During Pre-Design

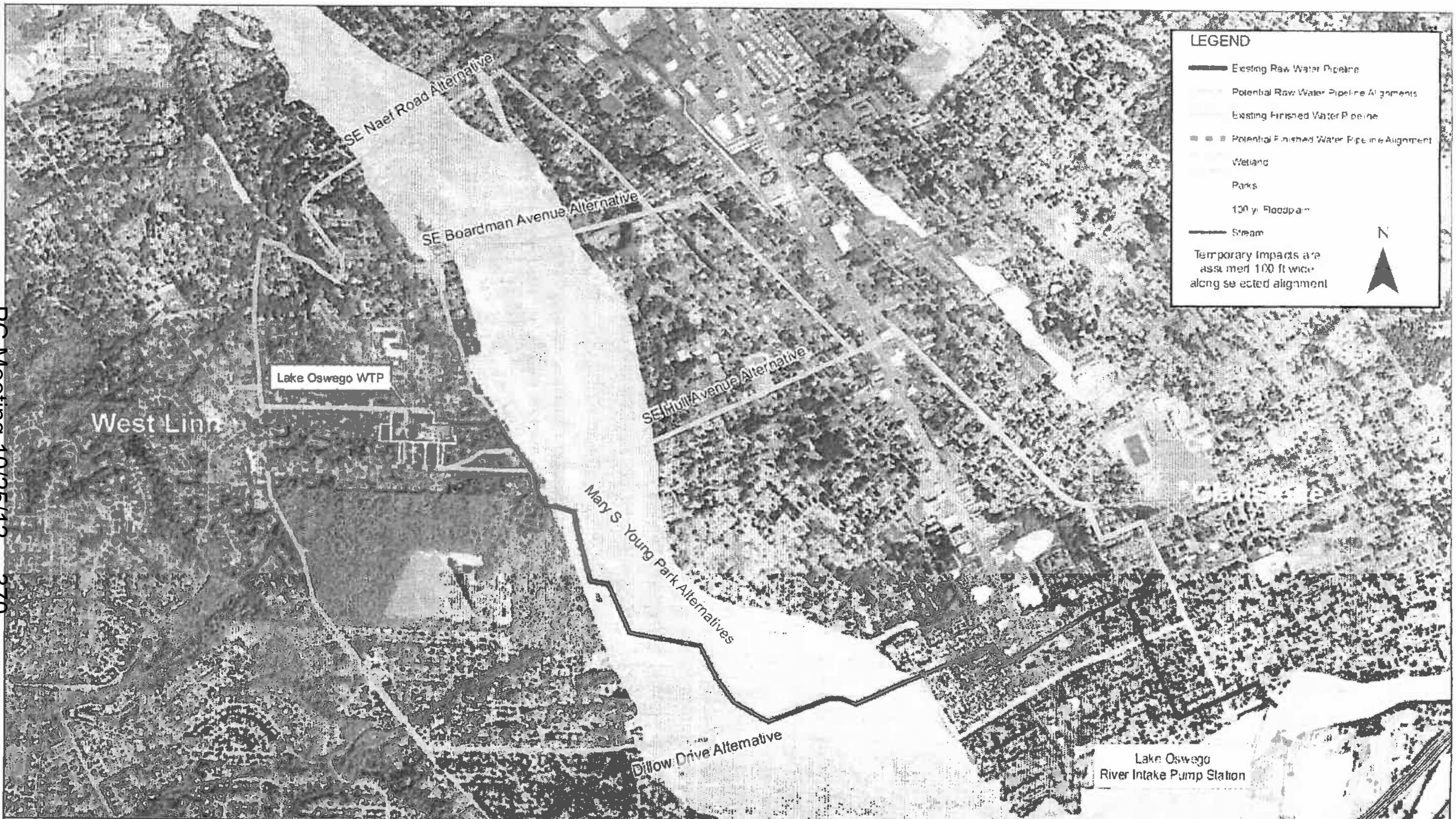
The inclined flat-plate screen, fixed tee-screen and rotating cylindrical tee-screen arrangements were evaluated during the project pre-design phase with respect to overall program evaluation parameters as follows:

- **Acceptability** – The rotating cylindrical tee screen with the brush cleaning system would be the most reliable for cleaning general debris and algae accumulations and the most accessible for periodic inspections and on-going maintenance.
- **Affordability** – The rotating cylindrical tee brush screen is the most expensive of the three screen alternatives, at an estimated cost of $561,000. The cylindrical tee screen with the air burst cleaning system is the least expensive, with an estimated cost of $295,000, and the inclined plate screen is in the middle with an estimated cost of $472,000.
- **Permitability** – All three screen alternatives would meet the NMFS screen design criteria, but the cylindrical brushed cleaned screen offers the best cleaning cycle time.

Despite the higher cost of the rotating cylindrical tee brush screens, they would be the best choice with respect to reliability, screen protection from river elements (permanence), cleaning, and ease of access for maintenance.

6.5 RWP ALTERNATIVES ANALYSIS

The proposed alternative would include construction of a new 14,000-foot-long, 42-inch-diameter RWP connecting the RIPS to the Lake Oswego WTP. The RWP would be sized to convey 38 MGD. The RWP consists of three primary segments: eastern, central, and western. The eastern segment of the RWP will extend from the new RIPS site in Gladstone to Meldrum Bar Park using primarily open-cut construction methods. The central segment of the RWP extends from Meldrum Bar Park in Gladstone near the river's edge on the east, across the river to the western HDD staging area in the vicinity of Mary S. Young State Park in West Linn. Construction methods and alignments for the central segment were



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Raw Water Pipeline Alignment Alternative Analysis

Figure 7

considered as part of this alternatives analysis. The western segment of the RWP extends from the west side of the Willamette River in the vicinity of Mary S. Young State Park to the WTP. Conventional open-cut construction methods are anticipated for this reach.

The Willamette River crossing, part of the central segment, is a critical element in the RWP alignment. Alternatives for this river crossing consist of the following:

- Fourteen locations for crossing the river; and
- Four construction methods: open-cut, horizontal directional drilling (HDD), microtunneling, and aerial (suspension bridge) crossing.

6.5.1 Raw Water Pipeline River Crossing Alternatives Considered

During a preliminary evaluation, 14 crossing locations were considered for the RWP Willamette River Crossing. An initial fatal flaw analysis eliminated nine crossing locations due to infeasible construction access in residential neighborhoods. Five crossing locations were deemed constructible and were included in a more in-detailed evaluation (see Figure 7). Of the remaining five crossing locations, two alternatives (Naef Road and Boardman Avenue) were eliminated because of significantly longer routes and higher costs. The Dillow Drive alternative was eliminated because of a significantly longer route and large variation in ground surface elevation, resulting in significantly higher costs, more complex engineering design and long term operating challenges. The Hull Avenue alternative was eliminated because of difficult construction access, high construction impacts to neighborhoods and residential property. The only available construction method for this route would be HDD, which would result in prolonged equipment staging in a residential neighborhood including a public road closure. Additionally, the HDD pipeline alignment would pass directly under several homes and many private parcels including open space lands owned by the City of West Linn. The West Linn charter prohibits utilities within such lands. For these reasons the preferred alignment selected for crossing the Willamette River was the Meldrum Bar to Mary S. Young State Park alignment.

The benefits of the proposed Meldrum Bar to Mary S. Young alignment are that it:

- Provides good construction access on both sides of the river;
- Avoids pipeline alignment and excavations down very steep and potentially unstable banks on the east side of the Willamette River that would be necessary for the open-cut construction method;
- Minimizes the impact to heavily traveled roads;
- Avoids construction impacts to the existing raw water pipeline crossing of the Willamette River;
- Has a lower total cost due to minimized overall length and the ability to design an alignment without complex curves;
- Minimizes impact to residents and businesses, particularly with respect to the east side of the Willamette River;

6.5.2 RWP River Crossing Construction Methods Considered

Both HDD and open-cut construction methods are considered to be viable alternatives for the Willamette River crossing at select crossing locations. The aerial crossing was not considered to be a viable construction method, due to high cost and land use permitability. Preliminary cost estimates for an aerial crossing were developed by Clearspan Engineering, a pipeline aerial crossing specialty consulting firm in Houston, Texas. An aerial crossing of the Willamette River is estimated to cost approximately $8,500 per foot of length (approximately $21.3 million for the chosen alternative length of 2,500 feet), which is nearly double the cost of HDD and open-cut alternatives. All aerial crossing alternatives were eliminated from further consideration. The aerial crossing construction method would make it difficult to permit because it would require an aerial crossing tower, and anchors and anchor cable in both Meldrum Bar and Mary S Young Parks.

Microtunneling was not considered to be a viable construction method, due to high cost and geological characteristics of the rock. Preliminary construction cost estimates for microtunneling were significantly higher than for the HDD and open-cut alternatives. In addition, the rock through which the alignment passes was found to have strengths in the range of 40,000 psi, while microtunneling is typically suited for rock strengths of 15,000 psi or less. As a result, all microtunneling alternatives were eliminated from further consideration.

After a comprehensive evaluation of alternative crossing designs, through a process that included workshops, value engineering exercises, and multiple geotechnical investigations, the Project Sponsors selected the alternative of crossing the Willamette River via HDD. Crossing the Willamette River by open-cut methods was initially preferred based on preliminary geotechnical results and value engineering. However, subsequent analysis confirmed that HDD was a feasible construction method at this location and all previous concerns regarding HDD were resolved to the satisfaction of the project team. Therefore, an open-cut method was rejected in light of the less impactful and feasible HDD method. The following analysis provides an in-depth look into the methodology and associated risks of using HDD verses those of the open-cut construction method. The information below was obtained from contractors and consultants with substantial qualifications in HDD technology, including Staheli Trenchless Consultants and Jacobs Associates.

6.5.2.1 HDD Construction Methodology and Associated Risks

The HDD Willamette River crossing would be constructed by setting up an entry operation at a staging area located in the vicinity of Mary S. Young State Park on the west bank of the Willamette River, with the exit point in Meldrum Bar Park on the east bank. The HDD entry and exit points have been carefully placed to minimize the risk of the crossing and to reduce construction impacts as much as possible to the park properties, the Willamette River, and surrounding wetlands. The Meldrum Bar site was selected as the exit side because it provided the only location from which the fully assembled pipe could be pulled into the HDD borehole without significant disruption to roads, parks, and nearby residents. Pilot hole and reaming operations would be accomplished from the western HDD staging area in the vicinity of Mary S. Young State Park HDD entry location. After pilot hole and reaming operations were completed, the carrier pipe pull-back system would also be deployed at the western HDD entry site. During this pipe pull-back operation, the pipe would be strung and assembled on the Willamette River (on barges) off-shore from Meldrum Bar Park or assembled off-site and transported to Meldrum Bar Park, and strung along the river upstream of the HDD exit point for pull-back.

The total period of HDD construction would be between six to nine months. The boring depth would range from 25 to 60 feet below the river bed.

The HDD process includes boring a hole using fluid-assisted cutting and removing the excavated material in a drilling mud slurry. As such, it relies on stable geotechnical conditions or mitigation measures that keep the borehole open during excavation, so that the drilling mud can flow through the bore and remove the excavated material. Ideal materials for HDD include firm silts or clays, dense sands, or rock. HDD construction costs and risks increase where geotechnical conditions include soils or rock that is unstable. Open-graded gravel presents more risks than other geotechnical conditions; however, current risk mitigation strategies can enable successful HDD installation in open-graded gravels.

6.5.2.1.1 Geotechnical Conditions at the Proposed Crossing Location

The geology along the proposed Willamette River crossing consists of sandy gravel alluvial deposits of silt, sand, and gravel for approximately 350 feet, transitioning into a zone of slightly weathered basalt for approximately 100 feet, and further transitioning into over 2,000 feet of high-strength unweathered basalt flow(s) of the Columbia River Basalt Group.

Geotechnical investigations indicate that the unweathered basalt in this location has a compressive strength ranging from 17,800 to 41,000 psi (R4-R5). However, at other locations along the bore, basalt bedrock, which was encountered at Elevation (El.) -56 feet, is fractured and contains slickensides and brecciated zones, indicating that the rock may have been sheared at these locations.

Meldrum Bar Park is located on a low, broad, flat alluvial terrace, which consists of unconsolidated silt, sand, and gravel deposits. Zones of open-graded gravel and cobbles are expected within the alluvial soils. One of the vertical boring logs indicated the loss of drilling fluid at an area of high blow counts with very low sample recovery. This is indicative of open-graded gravel or cobbles. Basalt bedrock was not encountered in one boring (HDD-1), which extended down to El. -95.2 feet. Over 45 feet of clayey decomposed basalt underlies the alluvium in boring HDD-1. This material is juxtaposed against approximately 12 feet of gravelly decomposed basalt in boring HDD-2 within the river channel.

An east or northeast trending inactive fault, which cuts across the Willamette River channel between borings HDD-1 and HDD-2, may explain the lack of basalt outcrops, the change in geomorphology, the lack of bedrock in boring HDD-1, and the presence of sheared zones in boring HDD-2. The bedrock surface on the north side of this fault is expected to be irregular.

6.5.2.1.2 HDD Risks Associated with Proposed Crossing Location

Both of the HDD experts (Staheli Trenchless Consultants and Jacobs Associates) that evaluated the potential RWP alignments identified the following risks and available mitigation measures associated with an HDD crossing at this location. Available mitigation measures will significantly reduce, if not eliminate, the following risks:

- The RWP is anticipated to pass through an abrupt transition between hard rock and alluvial deposits, which has been inferred to be an inactive fault. This transition may cause borehole instability if proper mitigation measures are not employed;
- **Hydrofracture** in unconsolidated alluvial gravel deposits could result in borehole collapse, loss of drilling mud, reduced drilling efficiency, and the inability to remove excavated material if proper mitigation measures are not employed; and
- Construction may result in **impacts to the public parks** on either side of the river crossing; construction staging layout during the design stage will focus on reducing public impacts to a reasonable level.

6.5.2.1.2.1. Drilling Across the Fault Line

An inactive fault line exists between geotechnical exploratory bore holes HDD-1 and HDD-2, which will result in drilling from hard rock (R4) into alluvial deposits in the vicinity of bore hole HDD-2. The primary risk of the fault crossing would be borehole instability. A preliminary evaluation by RSR Solutions, Inc., a Value Engineering team that included an expert in HDD technology, reviewed the alternative during a Value Engineering process identified the risk that the HDD drilling rods could bind up at this fault zone. Subsequent research by Staheli Trenchless has identified that the use of common HDD mitigation measures such as pumping grout into fractured rock areas prior to drilling and deploying Loss Circulation Material (LCM) within the bore hole to seal-up potential fractures can eliminate the risks of bore hole stability and binding of the drill rods. There is no concern that this inactive fault line poses risk to the pipeline beyond the construction phase.

6.5.2.1.2.2. Hydrofracture

Hydrofracture is a risk often associated with drilling in open-graded gravel deposits in which drilling fluid pressure exceeds the strength and confining stress of the soils surrounding the borehole. The excess pressure fractures the soil around the bore, allowing drilling fluid to escape from the borehole. The risk of hydrofracture was not found to be significant, except at the portions of the alignment located within open-graded gravel at the shallow portions of the alignment near the entry and exit locations where overburden is reduced and increased void space around grains may allow fluid escape. There is also a risk of borehole caving during reaming when gravel or cobbles are located in the crown of the bore. These materials are anticipated within the first 500 feet of the bore from Meldrum Bar Park. At Meldrum Bar Park, a conductor casing, an oversized pipe through which the bore hole is drilled, will be used for the first 200 feet to completely contain any potential hydrofracture and prevent borehole collapse. Other mitigation measures will be employed for the remaining 300 feet of open graded gravel in Meldrum Bar Park such as grouting and using LCM to significantly decrease the risks of hydrofracture or borehole collapse during drilling. The proposed HDD alignment has sufficient clear space from the existing RWP and additional monitoring measures will be put in place to ensure vibrations created during installation of the conductor casing via pipe ramming methods will not damage the existing pipeline.

6.5.2.1.2.3. Impacts to Public Parks

HDD installation will require construction staging areas to be located in two parks, one on either side of the Willamette River: Mary S. Young Park on the west side of the river, where the HDD construction entry point is anticipated to be located, and Meldrum Bar Park on the east, where the exit point and pipe pull-back area is anticipated to be located. The equipment staging areas needed for HDD will be approximately 0.6 acres at Meldrum Bar Park. The staging area has not yet been selected for the staging area in the vicinity of Mary S. Young State Park. The estimated duration for these staging areas is 6 to 9 months. A pipe layout area of approximately 1.5 acres (3,200-foot-long by 20-foot-wide) will be required on the river off-shore from Meldrum Bar Park for a shorter period of approximately 2 months during pipe assembly (welding and lining) and pull-back. The proposed staging areas for HDD construction will be situated to allow continued use of all park facilities including boat ramps and trails. HDD staging areas may result in limited tree and vegetation removal that will be mitigated where ever necessary. The pipe layout area on the river will be parallel and well to the side of the main channel.

HDD operations would be set up in the western HDD staging area in the vicinity of Mary S. Young Park above OHW. Pilot and reaming operations would be accomplished from this site. After pilot and reaming operations are completed, the pipe would be strung and assembled in Meldrum Bar Park for pull-back. Because of the limited bending radius of 42-inch-diameter welded steel pipe, the pipe will be laid out on the river via barges. The actual pulling operation is anticipated to be accomplished in one to two days. Cranes will be needed on the river for lofting the pipe for pulling into the borehole. No closure of either Mary S. Young or Meldrum Bar Park is anticipated during any stage in the HDD construction process.

The primary difference between the impacts to parks of HDD construction versus open-cut construction is associated with slight increase in the area required for the HDD entrance and exit staging areas and the additional area required for pipe assembly and pull-back. The slight increase in staging areas at Meldrum Bar and Mary S. Young Park is not anticipated to be significant as all park facilities will be accessible throughout construction. The impact from pipe pull-back is not considered significant as it will not affect Meldrum Bar Park and will be clear of the main channel and high boat traffic areas on the river.

6.5.2.1.3 HDD Cost Estimate

An initial review of the proposed HDD alignment by RSR Solutions, Inc., Jacobs Associates, and Staheli Trenchless Consultants and subsequent detailed cost estimate by Staheli Trenchless indicates that the cost of HDD will exceed the open-cut method by approximately $5 million. This cost includes mitigation measures that will significantly reduce or eliminate the risks discussed above and contingency for any additional uncertainty associated with HDD construction including costs resulting from installing conductor casing, grouting and using LCM.

6.5.2.2 Open-Cut Construction Method and Associated Issues

There are three distinct "in-water work" regions for the RWP open-cut river crossing alternative, where "in-water work" is any work below the ordinary high water line. The three in-water work areas for pipeline construction are: (1) in the Willamette River, (2) on the gravel bars east and west of the Willamette River, and (3) additional land work to arrive at the land-based raw water pipeline contract termination points. The open-cut method description and evaluation below pertain to pipeline construction below the ordinary high water line.

6.5.2.2.1 Open-Cut Construction Method

The open-cut river crossing trench is assumed to be benched at a slope of 2:1 (horizontal-to-vertical). Onshore staging for open-cut construction would be within portions of both Meldrum Bar Park and Mary S. Young State Park. Main river channel crossing work will be completed from barges using drag line or clamshell excavators. Material will be side-cast in the river and recovered for trench backfill pipe installation, although pipe bedding material will be imported via barges. Pipe will be set in place by barge-mounted cranes. It is expected that pipe segments will be joined on land to approximately 40-foot lengths to minimize the number of in-river joint connections that will be assembled by divers. Imported bedding material will be clean rock two to three inches in size, which will encapsulate the 42-inch-diameter pipe in the trench. Native material from the side-cast spoils will be placed in the trench over the pipe. To further protect the pipe and trench from scour erosion, riprap surface protection may be placed over the open-cut installation within the trench or at grade line. Rip-rap to be placed above the pipe zone material and beneath the side-cast excavation backfill material will also be imported using barges. Depth of cover of the pipe will range between 10 feet and 20 feet or more, with the intent being to match the elevation of the existing pipeline. The spoils that would remain outside of the trench as a result of the volume occupied by the pipe and imported bedding material may be disposed of in a number of different ways, including relocating the spoils to a downstream scour hole, excavating and disposing off-site, and flattening in place. Shoreline work will be completed using conventional excavation equipment on mats with materials delivery via barge as necessary.

6.5.2.2.2 Sediment Evaluation Framework (SEF)

The U.S. Army Corps of Engineers Sediment Evaluation Framework (SEF) provides guidance for the assessment and characterization of freshwater and marine sediments in Idaho, Oregon, and Washington. For the open-cut RWP alternative, 12 pieces of information were compiled for the SEF Level 1 Site History Review. This review identified insignificant risk of those potential contaminants being present. Based on these results, it was determined that physical and chemical testing was not warranted.

6.5.2.2.3 Beneficial Use of Trench Spoil Material

It is anticipated that there will be an excess amount of native spoil material from trenching the pipeline, estimated to be 11,500 cubic yards. The excess native spoil material may be placed within the Ross Island Wetland and Riparian Habitat Reclamation Plan (Ross Island Plan) area. Implementation of the Ross Island Plan will result in development of 118 acres of upland forest, 22 acres of wetland habitat, and 14 acres of shallow water habitat. Because the SEF determined that the excavated trench material is suitable for in-water placement, it is anticipated that Ross Island Sand and Gravel will accept the material; however, there has been no coordination with Ross Island Sand and Gravel.

6.5.2.2.4 Risks and Consequences at the Selected Crossing Location

A thorough geotechnical boring investigation was conducted along the open-cut river crossing alignment. These borings did not encounter rock outcroppings that would impact open-cut construction methods and cost; therefore rock excavation is not considered a risk of the open-cut construction methodology at this location. A thorough analysis of other potential risks for an open-cut construction methodology identified the following major risks:

- An open-cut crossing will require extensive underwater excavation, which will result in an increased risk of undesirable **turbidity levels** in the area surrounding the project. However, available mitigation measures will be able to decrease this risk;
- An open-cut crossing will require a significant amount of construction to occur with-in the designated **in-water work window**. Although the duration of the work is not anticipated to extend beyond the work window, there are many unknowns in marine construction which could result is delays, which could result in missing the target window; and
- Open-cut pipeline installation will require a significant amount of equipment and activity. Additionally, marine construction crews will need access to their equipment from shore, which will result in impacts to parks on both sides of the river. This equipment and activity will result in adverse **impacts to the river and parks** within the vicinity of the construction location.

6.5.2.2.5 Turbidity Levels

Due to the large amount of underwater excavation required for an open-cut crossing of the Willamette River there is a high risk of increased turbidity. Turbidity control related to open-cut construction will occur through a multi-pronged approach that includes monitoring, silt curtain implementation, minimal spoils relocation, and careful spoils side-casting placement.

Turbidity may be reduced by maintaining silt curtains downstream of the excavation and side cast activity as it progresses across the river. Silt curtains promote settlement within a relatively short distance downstream from the disturbance activities. The following silt curtain measures would be considered:

- Prior to excavation, silt curtains would be deployed downstream from earthwork activity to allow side-casting of excavated material.
- Silt curtains would be anchored to a barge or floats, establishing an in-river anchoring system.
- Silt curtains would be installed and maintained as the excavation and backfill operations move across the river channel.
- Silt curtains would be maintained during harvesting of excess spoils materials for off-site disposal.

A spoils management plan will be developed to address the portion of spoils that will not be used to backfill the trench. Some material (if not needed for backfill) could be placed in a barge and taken elsewhere for disposal or, if suitable, to a gravel material processor.

In order to minimize the effects of the open-cut crossing, silt curtains will be placed to isolate the shallow water shoreline areas. This method was used for a pipeline crossing of the lower Clackamas River in 2004. Any juvenile salmonids isolated between the silt curtain and the bank would be removed prior to excavation within the isolation area. Silt curtains would be used in the main channel. This type of silt curtain arrangement can be designed for containment in the deeper, swifter portion of the channel for river velocities of up to 2.5 fps. Summer main channel velocities at this location in the Willamette range from 1.0 to 2.3 fps. Although, no measurable long-term effects would be anticipated from the excavation activities and mitigation measures will be in place there is still a risk of increased turbidity during construction.

6.5.2.2.6 In-Water Work Window and Fish Presence

The preferred ODFW in-water work window for the affected section of the Willamette River is July 1 through October 31. It is expected that open-cut construction could be mobilized in the river for this entire period.

This in-water work window partially coincides with peak fall Chinook adult migration into the Clackamas River; some, more limited adult steelhead and coho migration into the Clackamas River; and the end of the adult Upper Willamette River spring Chinook migration. Lower Columbia River (fall) Chinook spawn in the lower Clackamas River and could potentially spawn at Meldrum Bar, although spawning has not been confirmed at this location.

6.5.2.1.2.4. Impacts to the River and Parks

Open-cut installation will require a large footprint of marine construction equipment including delivery barges, assembly barges, crane barges, dive barges, and work boats within the vicinity of the construction area. A significant amount of the marine work will be conducted within the main channel of the Willamette River and thereby affect river traffic and recreational activities near the construction area. Additionally, access to marine equipment will be made from Meldrum Bar Parks which could require temporary docks and access to boat ramps and possibly result in restrictions to park facilities.

6.5.2.2.7 Open-Cut Cost Estimate

As stated above, initial cost estimates indicate that the open-cut method is significantly less expensive than the HDD alternative by approximately $5 million. However, it is very difficult to determine the cost of potential risks and large construction claims. As construction claims and risk mitigation has been more fully explored for the HDD option, it is anticipated that the open-cut construction costs would increase with more development.

6.5.3 HDD versus Open-Cut Construction Alternatives Evaluation

HDD and open-cut construction methods for the Willamette River RWP crossing were evaluated in relation to the three evaluation criteria of acceptability, affordability, and permitability, based on the findings discussed in the previous sections. Despite being more expensive, the HDD construction method was selected as the most desirable alternative based on the information presented above and the evaluation below.

- **Acceptability** – Use of the HDD construction method of the Willamette River RWP crossing is a more acceptable alternative because it would significantly decrease the amount of in-water work and potential adverse impacts to the Willamette River and recreational users. The duration of construction at each side of the river resulting from HDD construction will be will significantly longer than what would be required for open-cut, but the construction areas will be small and still allow full access and use of the facilities at each park. Available HDD mitigation measures reduce construction risks that could cause delays in the completion of the project and additional impacts. Construction risks during open-cut construction could result in construction delays in which the project duration could possibly extend beyond the allowable in-water work window resulting in additional impacts to fish, recreation, and traffic in the river.
- **Affordability** – The HDD alternative is estimated to be more expensive than the open-cut alternative by approximately $5 million dollars, or roughly 80 percent of the cost of the estimated open-cut RWP crossing.
- **Permitability** – The HDD alternative avoids the possible impacts to listed fish. Although open-cut construction of the RWP across the Willamette River could be completed during the Willamette River in-water work window, construction risks could result in decreased water quality (increased turbidity) during the in-water work window or project delays resulting in construction extending beyond the allowable schedule. Either a decrease in water quality during the in-water work window or project delay could result in an impact to adult upstream and juvenile downstream migrants.

6.6 FINISHED WATER PIPELINE

The FWP has four potentially environmentally sensitive water and wetland crossings: Oswego Creek, Oswego Lake, the Lake Oswego Hunt Club, and Springbrook Creek.

6.6.1 Oswego Creek and Lake Crossing Alignment

There are four alternatives for constructing a pipeline across and around Oswego Creek and Oswego Lake (see Figure 8):

1. Attach the pipeline to the Highway 43 Bridge;

2. Attach the pipeline to the McVey Bridge;
3. Open cut Oswego Creek and install the pipe in a trench; or
4. Use an alignment that avoids Oswego Creek, west along Laurel Street.

The Highway 43 Bridge over Oswego Creek is old and has seismic stability issues. There are no planned improvements to this bridge that would rectify these issues. If the pipeline were to be attached to the bridge, substantial bridge improvements would likely be necessary to allow this alternative to move forward. These improvements, although not specifically estimated as part of the alternatives analysis, would be very expensive, perhaps prohibitively so.

The McVey Bridge lacks any known comprehensive seismic reports and is located approximately 100 feet downstream from the Oswego Lake Dam owned by the Lake Corporation. The outcome of several workshops conducted by the Project Sponsors concluded that the FWP was not worth the perceived risk of the effect of an unknown seismic event on the bridge or dam that could potentially damage the FWP. In addition, crossing McVey Bridge would include open-cut construction methods on the heavily traveled McVey Avenue and on State Street, which would have an extensive negative impact on the entire community.

Installing the pipeline in a trench across Oswego Creek also has some significant drawbacks. Oswego Creek runs through a steep, narrow ravine in the area of the crossing. The slopes are wooded and geologically unstable, with exposed rock in some areas. Construction in unstable slopes and in rock increases costs and poses difficulties that are better avoided. Avoiding cutting the wooded areas is also preferable from an environmental perspective. Additionally, Oswego Creek crossing alternatives could be disruptive to George Rogers Park. Therefore, the preferred alternative would be to not cross Oswego Creek, but rather to construct the pipeline so that it travels west along Laurel Street and then resumes its northward path upstream from Oswego Creek. This alignment would cross the southeast arm and Lakewood Bay portions of Oswego Lake.

To minimize traffic-related and environmental construction impacts, the FWP would be constructed under Oswego Lake by the HDD method. The preferred alignment along Laurel Street would travel west on Laurel Street from Highway 43 to Erickson Street and then travel north on Erickson Street to the HDD exit staging area, located at Erickson Street and McVey Avenue. The 2,600-linear-foot HDD alignment would cross under several private properties, the southeast arm of Oswego Lake, Kenwood Road, Lakewood Bay, and the Union Pacific Railroad to the HDD entrance staging area at the intersection of Fifth Street and Cabana Lane. From this location, the FWP alignment would continue in a northwesterly direction through public rights-of-way to the Lake Oswego Hunt Club and Springbrook Creek crossing.

6.6.2 Oswego Creek and Lake Crossing Alternatives Evaluation

The FWP alignment at these locations were evaluated in relation to the three evaluation criteria of acceptability, affordability, and permitability, based on the findings discussed in the previous sections. The Laurel Street to Erickson Street with the HDD crossing of Oswego Lake alignment was selected as the most desirable alternative based on the above information and the evaluation below.

- **Acceptability** – The Oswego Creek alignment was found to cause the most disturbance to the communities in the area of the alignments. The Laurel Street HDD alignment provides the least disturbance to the surrounding communities and avoids the temporary impact of crossing

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Oswego Creek. The alignment alternatives that attach the FWP to either the Highway 43 Bridge or the McVey Bridge both pose seismic stability issues.

- **Affordability** – The Laurel Street HDD alignment is comparably priced but avoids the seismic stability issues of the alternative that attaches the FWP to the McVey Bridge or Highway 43 bridge.
- **Permitability** – The Laurel Street HDD alternative would avoid temporary impacts to Oswego Creek. This alternative would be permitable, provided that construction timing, techniques, and best management practices for protecting natural resources are implemented.

6.6.3 Lake Oswego Hunt Club and Springbrook Crossing Alignment

There are two location alternatives for constructing a pipeline across and around the Lake Oswego Hunt Club and Springbrook Creek (see Figure 9):

1. Install the pipeline in the Iron Mountain Boulevard right-of-way south of the Lake Oswego Hunt Club and cross Springbrook Creek within the Iron Mountain public right-of-way;
2. Install the pipeline through the Lake Oswego Hunt Club and cross Springbrook Creek immediately west of Hunt Club property

The Iron Mountain Boulevard right-of-way near the Hunt Club and the Springbrook crossing has a number of major utility installations and traffic limitations. The presence of utilities may result in the need for several utilities to be relocated in order to secure a corridor for the new FWP pipe. A traffic circle has been installed immediately west of the Springbrook Creek crossing that significantly decreases traffic control options to the point that a complete road closure would most likely be required to install the FWP through this area. Springbrook Creek crosses Iron Mountain Boulevard via a concrete culvert immediately east of the traffic circle. Recent survey identified that there is sufficient clearance above the culvert to allow the FWP to be installed above the culvert. Therefore, there would be no impacts to Springbrook Creek resulting from this alignment alterative.

The other alternative considered would avoid this congested section of the Iron Mountain Boulevard right-of-way. The Hunt Club alignment would require pipeline installation through the Lake Oswego Hunt Club property to the north of the right-of-way and cross Springbrook Creek immediately east of Brookside Road. This alignment through the Hunt Club would have minor impacts to degraded wetlands, but would otherwise stay within grassy fields used for recreational horse riding. After crossing through the Hunt Club, the alignment would cross Springbrook Creek via auger boring construction methods. Using auger boring methods could impact native fish passage and have minor impacts to the waterway. However, this construction method would require temporary diversion of the creek into a bypass pipe that would be installed in the stream bed. This temporary creek diversion would start upstream and extend downstream of the crossing location and would decrease the amount of construction dewatering required within the bore hole. Additionally, the trenchless crossing would require a jacking pit that would be over 30 feet deep within the Brookside Road right-of-way. This pit would result in significant traffic impacts on the road and may result in access issues for residents who rely on Brookside Road for access to their homes. After crossing Springbrook Creek, the alignment would continue on public right-of-way and property in a westerly direction to the City of Lake Oswego's reservoir on city-owned property near Waluga Park.

6.6.4 Lake Oswego Hunt Club and Springbrook Crossing Alternatives Evaluation

The FWP alignment at this location was evaluated in relation to the three evaluation criteria of acceptability, affordability, and permitability, based on the findings discussed in the previous sections. The alignment alternative along Iron Mountain Boulevard crossing over the Springbrook Creek culvert within the existing roadway, through the traffic circle and continuing west along Upper Drive was selected as the most desirable alternative based on the above information and the evaluation below.

- **Acceptability** – The Hunt Club alignment was found to cause the most disturbance to the communities in the area of the alignments. The Iron Mountain Boulevard alignment provides less disturbance to the surrounding communities.
- **Affordability** – It is estimated that the Iron Mountain Boulevard alignment was the least expensive. A longer alignment and expensive auger bored crossing of Springbrook Creek for the Hunt Club alternative makes it a less attractive financial option.
- **Permitability** – The Iron Mountain boulevard alternative would have no environmental impacts. The Hunt Club alternative would temporarily impact Springbrook Creek and slightly impact degraded wetlands.

7 CONCLUSION

The proposed project would expand the current Lake Oswego and Tigard water supply facilities to accommodate the existing and future needs of both the City of Lake Oswego (24 MGD) and the City of Tigard (20 MGD), utilizing Lake Oswego's senior and junior water rights on the Clackamas River of 38 MGD. The City of Tigard will also use its ASR system as a supplemental supply source for up to 6 MGD during peak demand periods. The proposed project is the only alternative that meets the Project Sponsors' objectives of providing an adequate, safe, reliable, long-term, acceptable, and affordable regional water supply to Lake Oswego and Tigard, both for current demands and for the anticipated growth in demand forecast to occur over the 30-year planning horizon. Water supply source reliability is ensured for both Lake Oswego and Tigard through the ownership of their water supply. The proposed project would also be the most acceptable to the communities that it serves because the Clackamas River is an excellent source of high quality raw water and new infrastructure would replace unreliable and obsolete facilities at the lowest NPV of all alternatives considered.

The proposed project will reliably serve the needs of both communities for the long term and can be fully operational by the expiration of Tigard's contract with Portland on June 30, 2016.

The construction methods, construction timing, and alignment details have been developed to minimize environmental impacts by avoiding waters and geologically unstable areas and by boring major crossings to the extent practicable.

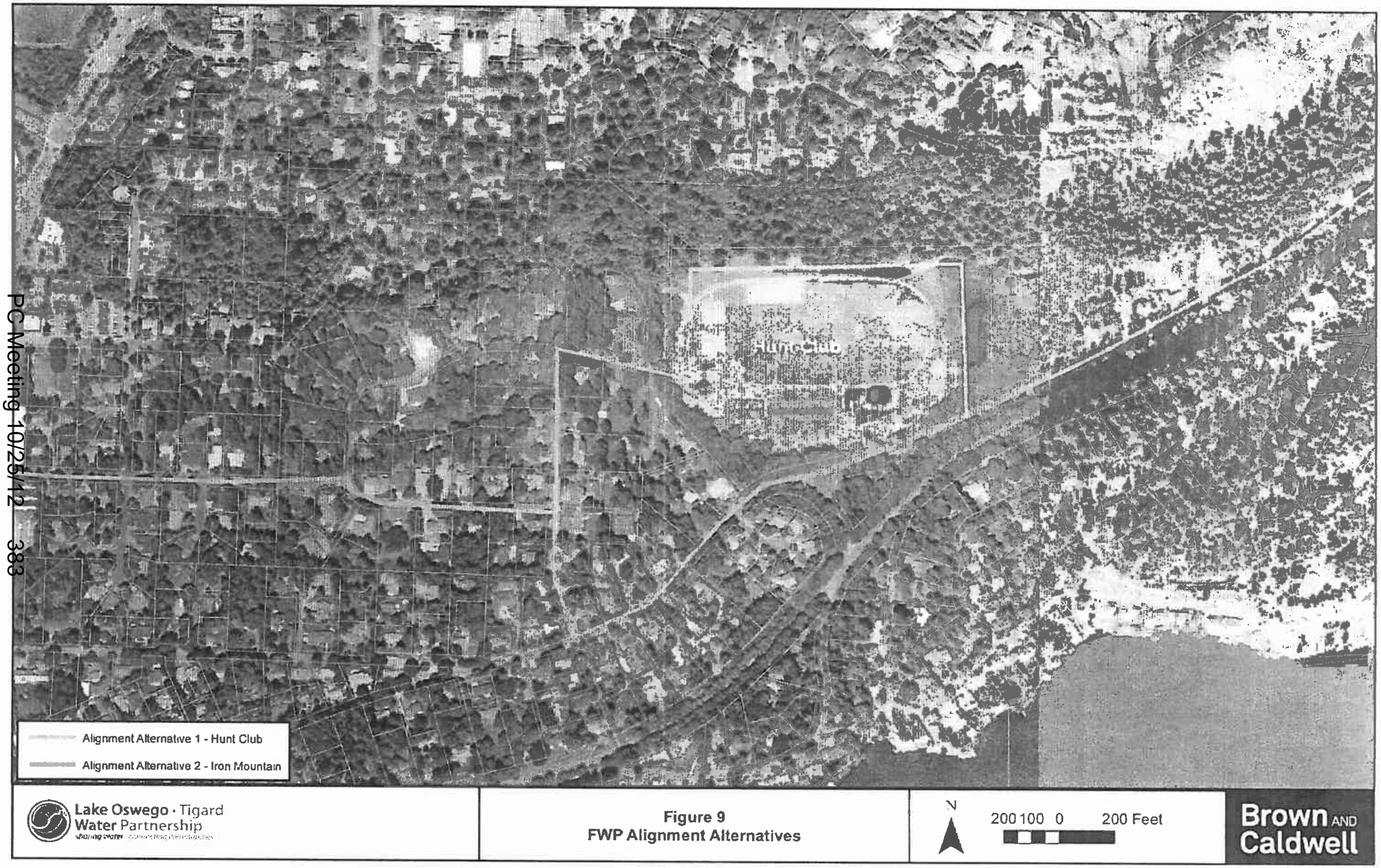


Figure 9
FWP Alignment Alternatives

Lake Oswego · Tigard
Water Partnership
sharing water · connecting communities

Appendix G: Adjacent Taxlot Maps

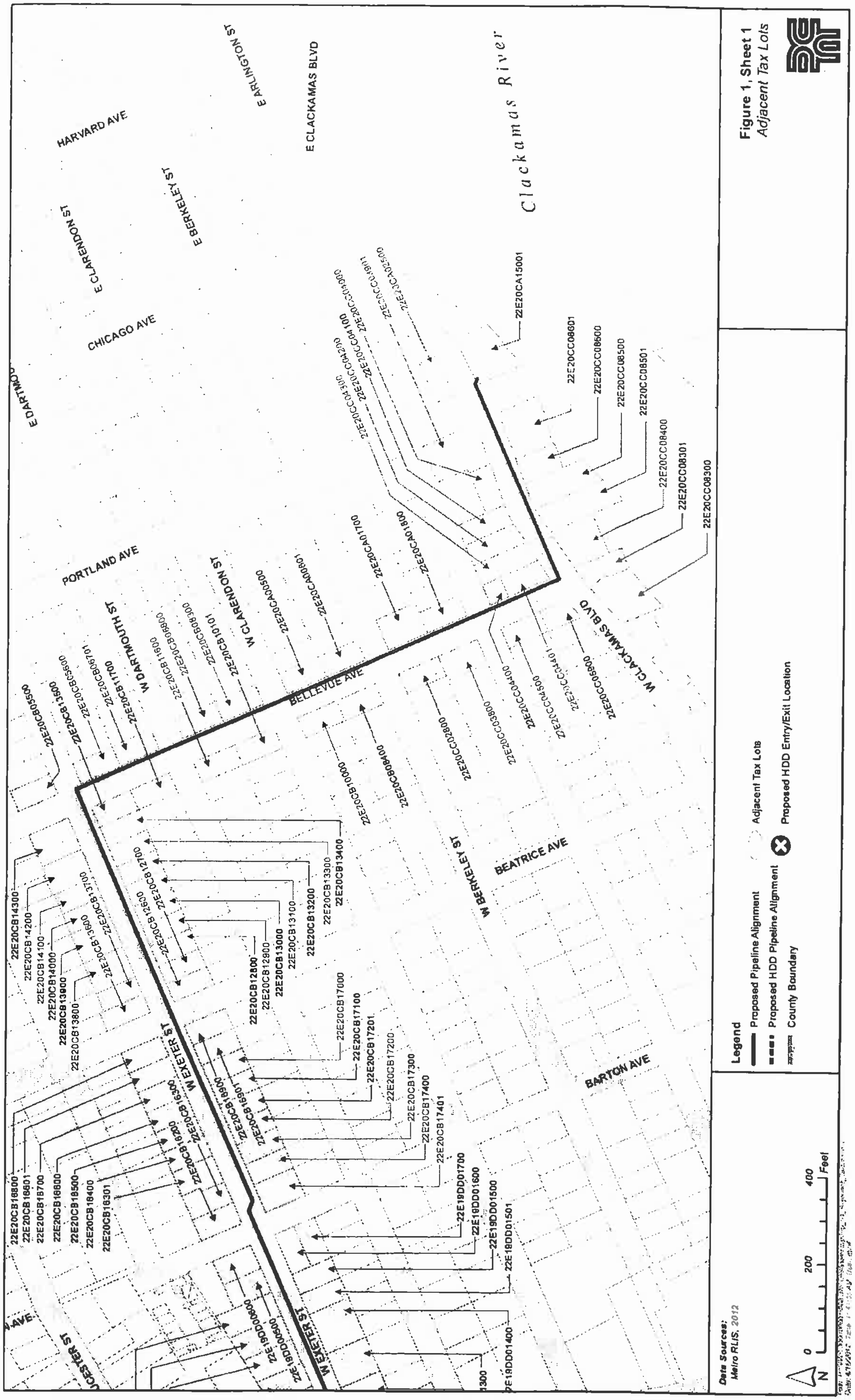


Figure 1, Sheet 1
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
Clackamas River
HARVARD AVE
E CLARENDON ST
E BERKELEY ST
E ARLINGTON ST
E CLACKAMAS BLVD
CHICAGO AVE
E DARTMOUTH
PORTLAND AVE
W DARTMOUTH ST
W CLARENDON ST
BELLEVUE AVE
W CLACKAMAS BLVD
W BERKELEY ST
BEATRICE AVE
BARTON AVE
W EXETER ST

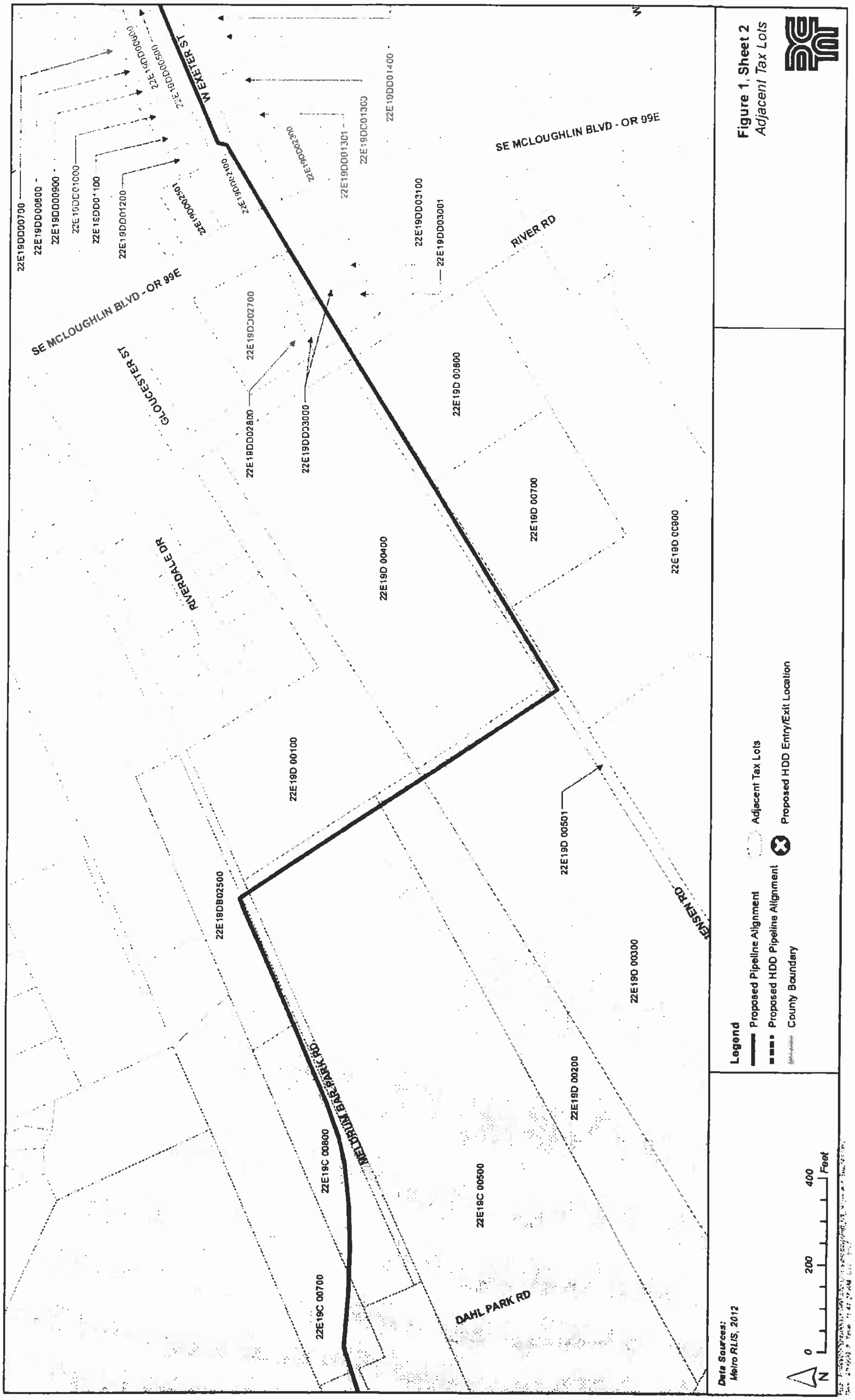


Figure 1, Sheet 2
Adjacent Tax Lots
W EXETER ST
SE MCLOUGHLIN BLVD - OR 99E
SE MCLOUGHLIN BLVD - OR 99E
GLOUCESTER ST
RIVER RD
RIVERDALE DR
JENSEN RD
DAHL PARK RD
22E19DD00700
22E19DD00800
22E19DD00900
22E19DD01100
22E19DD01200
22E19DD02700
22E19DD02800
22E19DD03000
22E19DD03100
22E19DD03001
22E19DC01300
22E19DD01400
22E19D 00600
22E19D 00700
22E19D 00800
22E19D 00400
22E19D 00100
22E19D 00501
22E19D 00300
22E19D 00200
22E18DB02500
22E19C 00800
22E19C 00500
22E19C 00700
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N

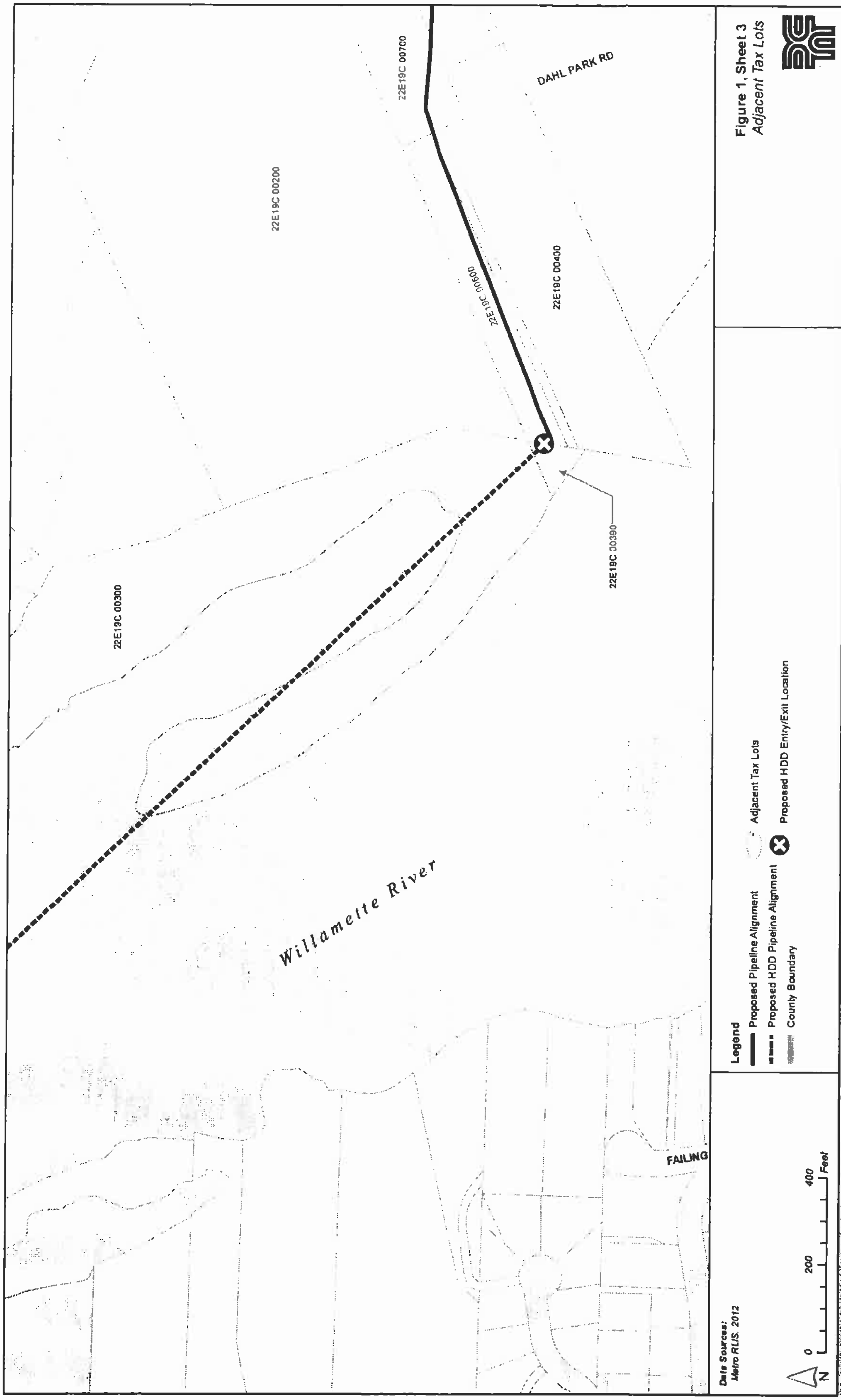


Figure 1, Sheet 3
Adjacent Tax Lots
DAHL PARK RD
22E19C 00700
22E19C 00200
22E19C 00600
22E19C 00400
22E19C 00300
22E19C 00390
Willamette River
FAILING
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N

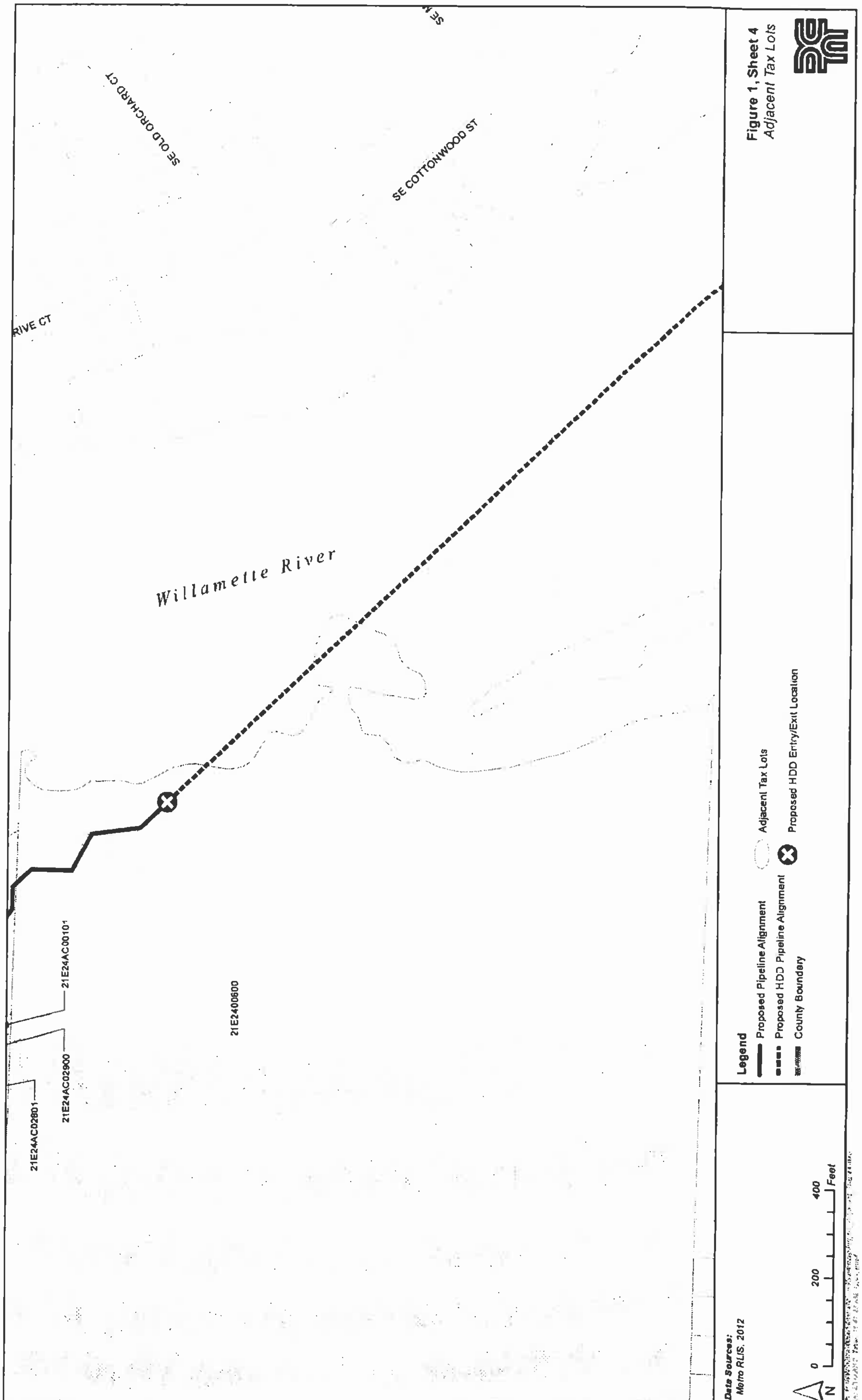
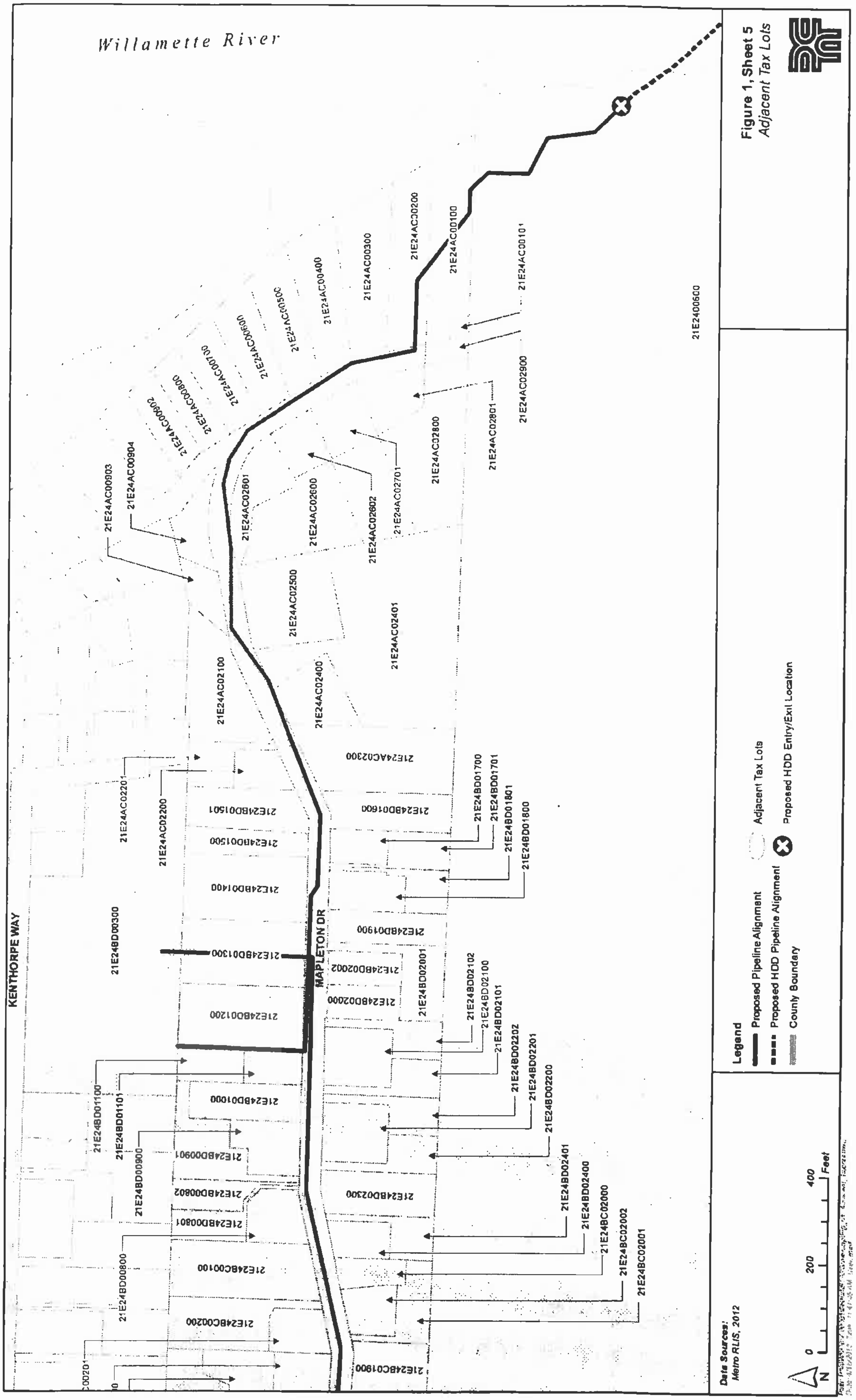


Figure 1, Sheet 4
Adjacent Tax Lots
SE OLD ORCHARD CT
SE COTTONWOOD ST
RIVE CT
Willamette River
21E24AC00101
21E24AC02900
21E24AC02801
21E2400600
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N


Willamette River
KENTHORPE WAY
MAPLETON DR
21E24AC00903
21E24AC00904
21E24AC00902
21E24AC00800
21E24AC00700
21E24AC00600
21E24AC00500
21E24AC00400
21E24AC00300
21E24AC00200
21E24AC00100
21E24AC00101
21E24AC02601
21E24AC02600
21E24AC02602
21E24AC02701
21E24AC02800
21E24AC02801
21E24AC02900
21E24AC02500
21E24AC02401
21E24AC02400
21E24AC02100
21E24AC02300
21E24AC02201
21E24AC02200
21E24BD01501
21E24BD01600
21E24BD01700
21E24BD01701
21E24BD01801
21E24BD01800
21E24BD01500
21E24BD01400
21E24BD01300
21E24BD00300
21E24BD01900
21E24BD02002
21E24BD02001
21E24BD02000
21E24BD01200
21E24BD02102
21E24BD02100
21E24BD02101
21E24BD02202
21E24BD02201
21E24BD02200
21E24BD01100
21E24BD01101
21E24BD01000
21E24BD00900
21E24BD00901
21E24BD00802
21E24BD00801
21E24BD00800
21E24BD02300
21E24BD02401
21E24BD02400
21E24BC02000
21E24BC02002
21E24BC02001
21E24BC00100
21E24BC00200
21E24BC01900
21E2400600
Figure 1, Sheet 5
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N

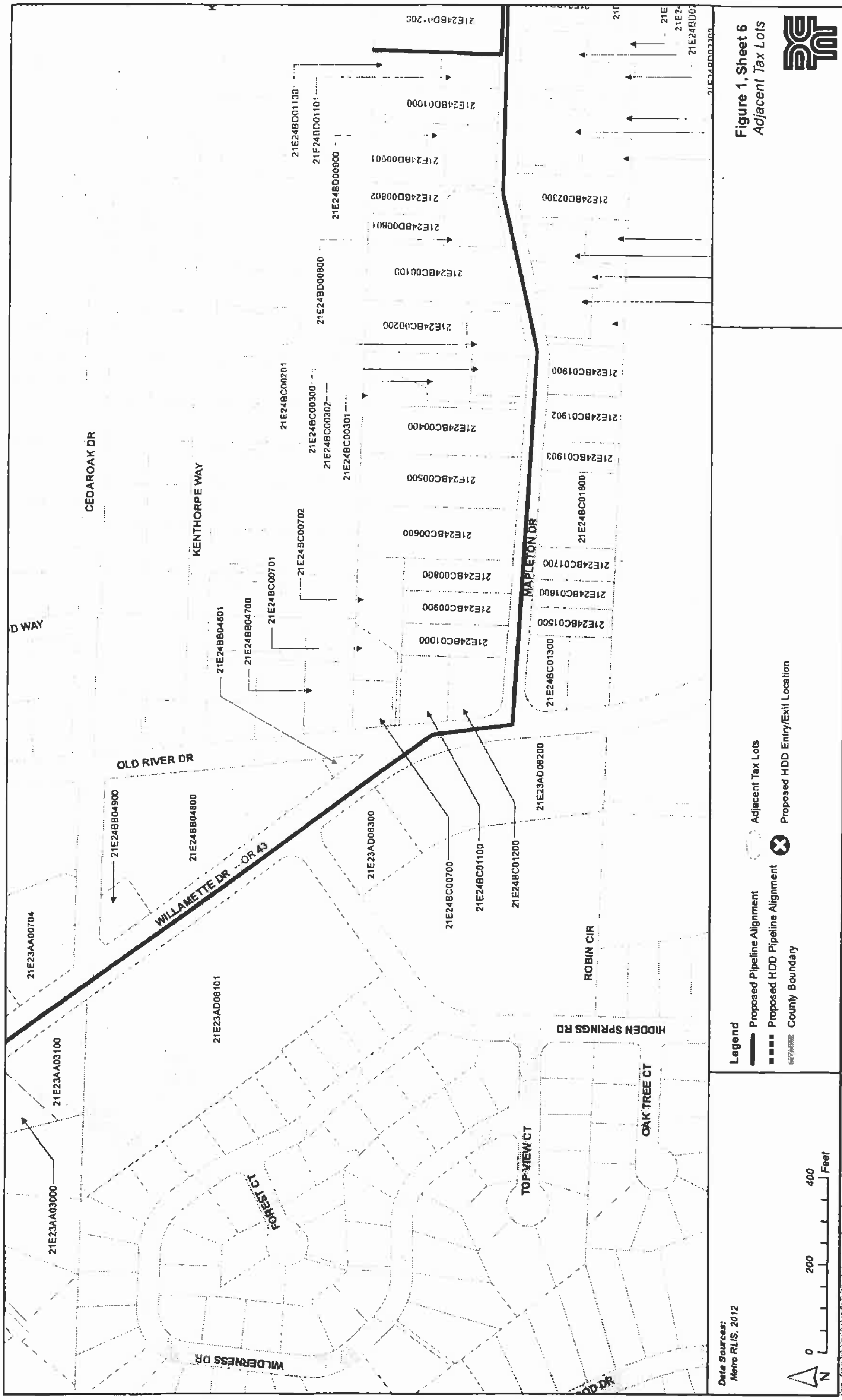


Figure 1, Sheet 6
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
WILLAMETTE DR - OR 43
OLD RIVER DR
CEDAROAK DR
KENTHORPE WAY
MAPLETON DR
ROBIN CIR
HIDDEN SPRINGS RD
OAK TREE CT
TOP VIEW CT
FOREST CT
WILDERNESS DR
21E24BC00700
21E24BC01100
21E24BC01200
21E23AD08200
21E23AD08300
21E23AD08101
21E24BB04900
21E24BB04800
21E23AA00704
21E23AA03100
21E23AA03000
21E24BB04801
21E24BB04700
21E24BC00701
21E24BC00702
21E24BC00201
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21E24BD01130
21E24BC01300

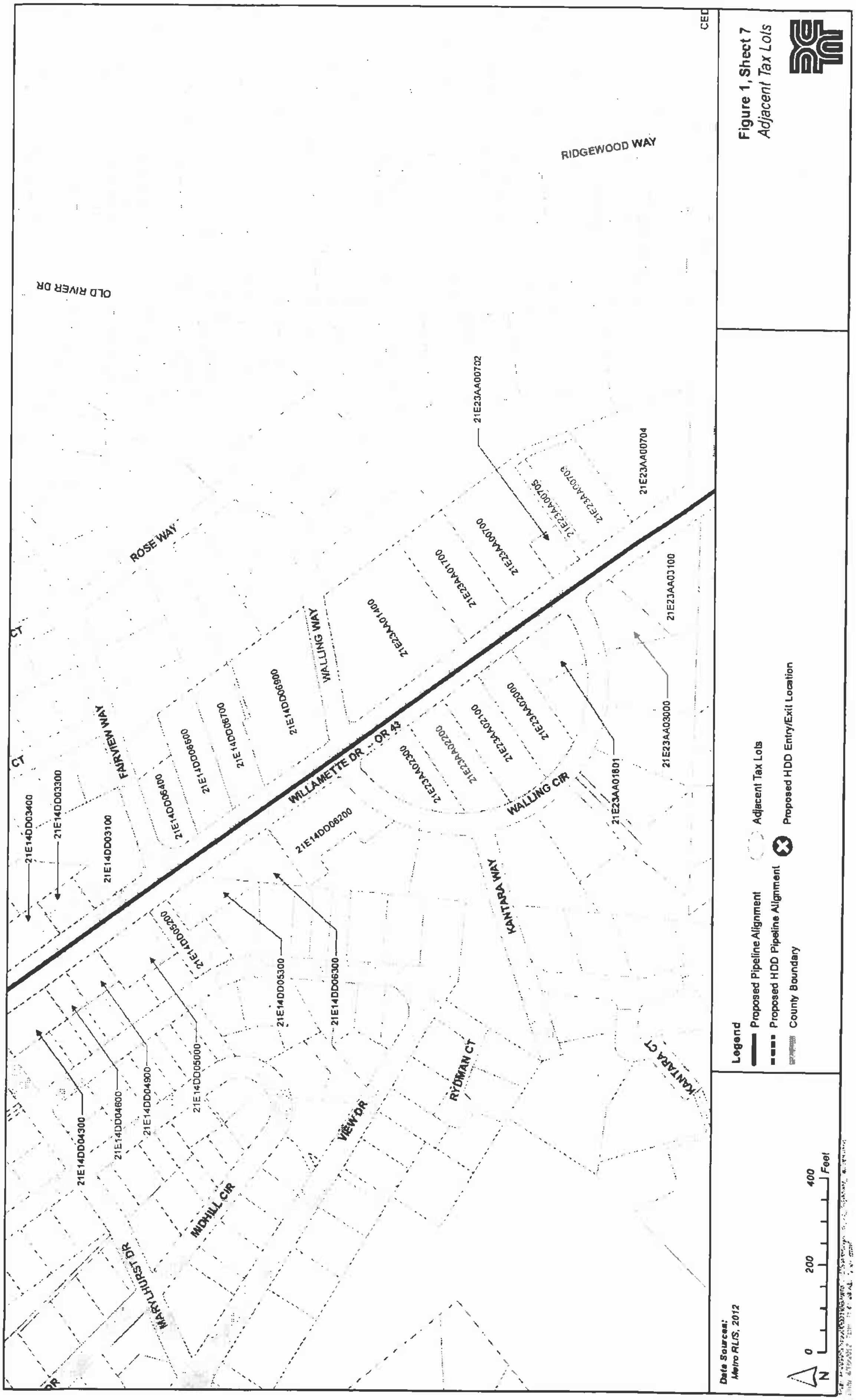
Figure 1, Sheet 7
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
RIDGEWOOD WAY
OLD RIVER DR
ROSE WAY
WALLING WAY
FAIRVIEW WAY
WILLAMETTE DR - OR 43
WALLING CIR
KANTARA WAY
KANTARA CT
RYDMAN CT
VIEW DR
MIDHILL CIR
MARYLHURST DR
21E23AA00702
21E23AA00704
21E23AA00703
21E23AA00705
21E23AA00700
21E23AA01700
21E23AA01400
21E23AA03100
21E23AA03000
21E23AA02000
21E23AA02100
21E23AA02200
21E23AA02300
21E23AA01801
21E14DD06900
21E14DD06700
21E14DD06600
21E14DD06400
21E14DD06200
21E14DD03400
21E14DD03300
21E14DD03100
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21E14DD04600
21E14DD04300

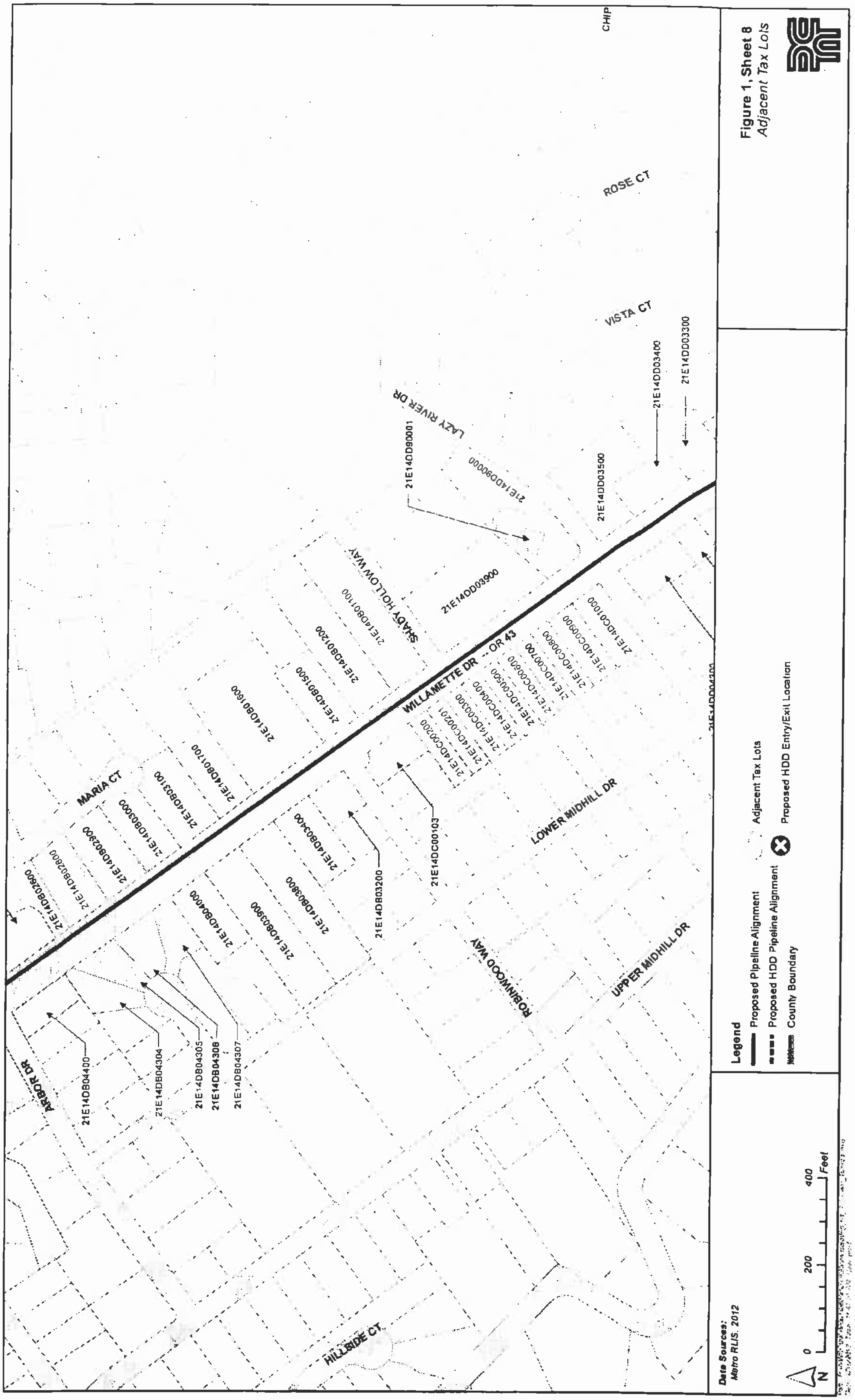
Figure 1, Sheet 8
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
CHIP
ROSE CT
VISTA CT
LAZY RIVER DR
SHADY HOLLOW WAY
WILLAMETTE DR - OR 43
MARIA CT
ARBOR DR
LOWER MIDHILL DR
UPPER MIDHILL DR
ROBINWOOD WAY
HILLSIDE CT
21E14DD03400
21E14DD03300
21E14DD90001
21E14DD90000
21E14DD03500
21E14DD03900
21E14DB01100
21E14DB01200
21E14DB01500
21E14DB01600
21E14DB01700
21E14DB03100
21E14DB03000
21E14DB02900
21E14DB02800
21E14DB02600
21E14DC01000
21E14DC00900
21E14DC00800
21E14DC00700
21E14DC00600
21E14DC00500
21E14DC00400
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21E14DB04306
21E14DB04307

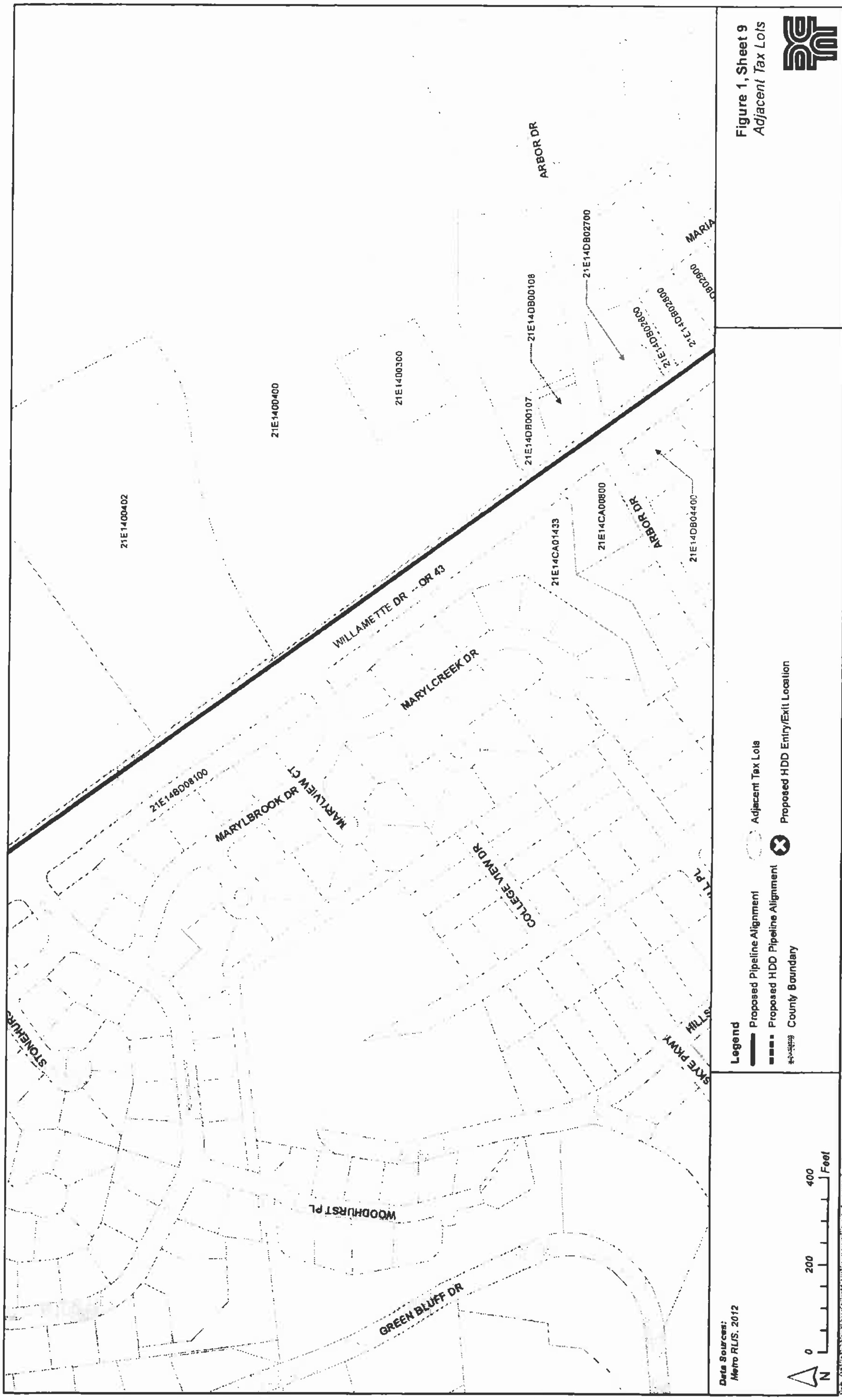

Figure 1, Sheet 9
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
WILLAMETTE DR -- OR 43
MARYLCREEK DR
MARYLBROOK DR
MARYLVIEW CT
COLLEGE VIEW DR
WOODHURST PL
GREEN BLUFF DR
SKYE PKWY
ARBOR DR
MARIA
21E1400402
21E1400400
21E1400300
21E14DB00107
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21E14DB04400
21E14BD08100

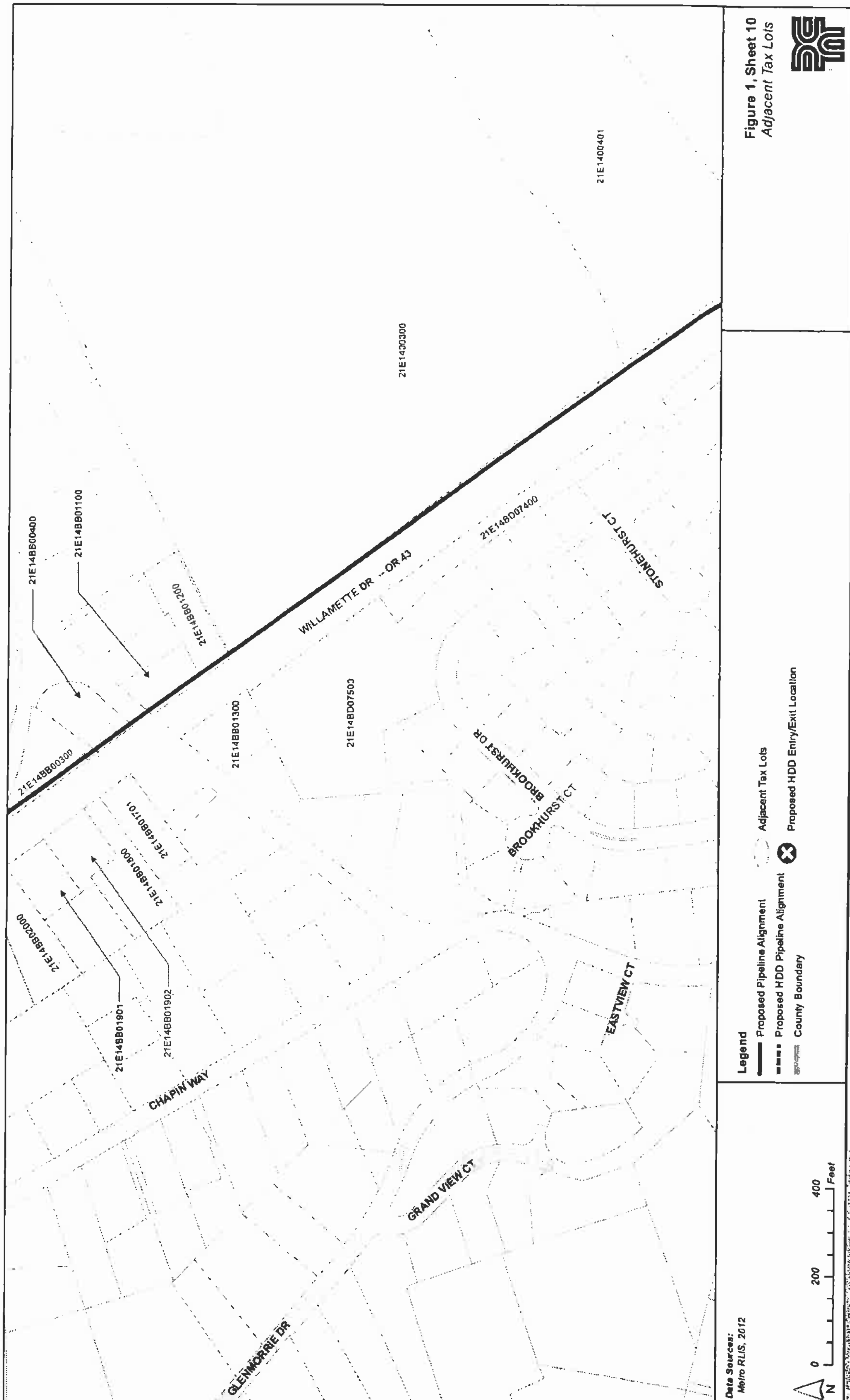
Figure 1, Sheet 10
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
WILLAMETTE DR - OR 43
CHAPIN WAY
GLENMORRIE DR
GRAND VIEW CT
EASTVIEW CT
BROOKHURST CT
BROOKHURST DR
STONEHURST CT
21E1400401
21E1400300
21E14BD07400
21E14BD07500
21E14BB01300
21E14BB01200
21E14BB01100
21E14BB00400
21E14BB00300
21E14BB01701
21E14BB01800
21E14BB01902
21E14BB01901
21E14BB02000

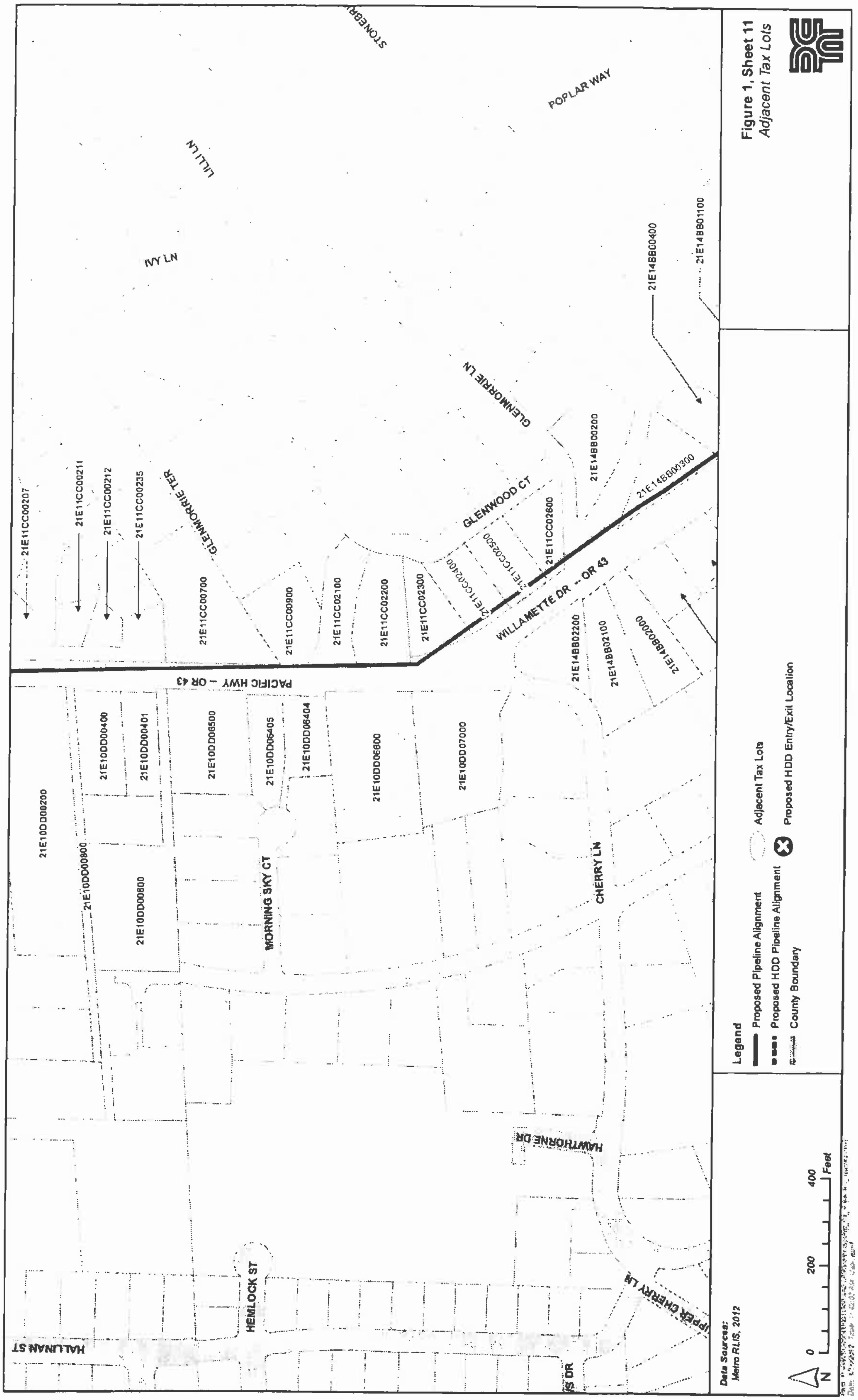
Figure 1, Sheet 11
Adjacent Tax Lots
PACIFIC HWY – OR 43
WILLAMETTE DR – OR 43
GLENMORRIE LN
GLENMORRIE TER
GLENWOOD CT
POPLAR WAY
LILLI LN
IVY LN
STONEBRIDGE
MORNING SKY CT
CHERRY LN
HAWTHORNE DR
HEMLOCK ST
HALLINAN ST
UPPER CHERRY LN
21E11CC00207
21E11CC00211
21E11CC00212
21E11CC00235
21E11CC00700
21E11CC00900
21E11CC02100
21E11CC02200
21E11CC02300
21E11CC02400
21E11CC02500
21E11CC02600
21E14BB00200
21E14BB00300
21E14BB00400
21E14BB01100
21E14BB02200
21E14BB02100
21E14BB02000
21E10DD00200
21E10DD00400
21E10DD00401
21E10DD00800
21E10DD00800
21E10DD06500
21E10DD06405
21E10DD06404
21E10DD06600
21E10DD07000
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N

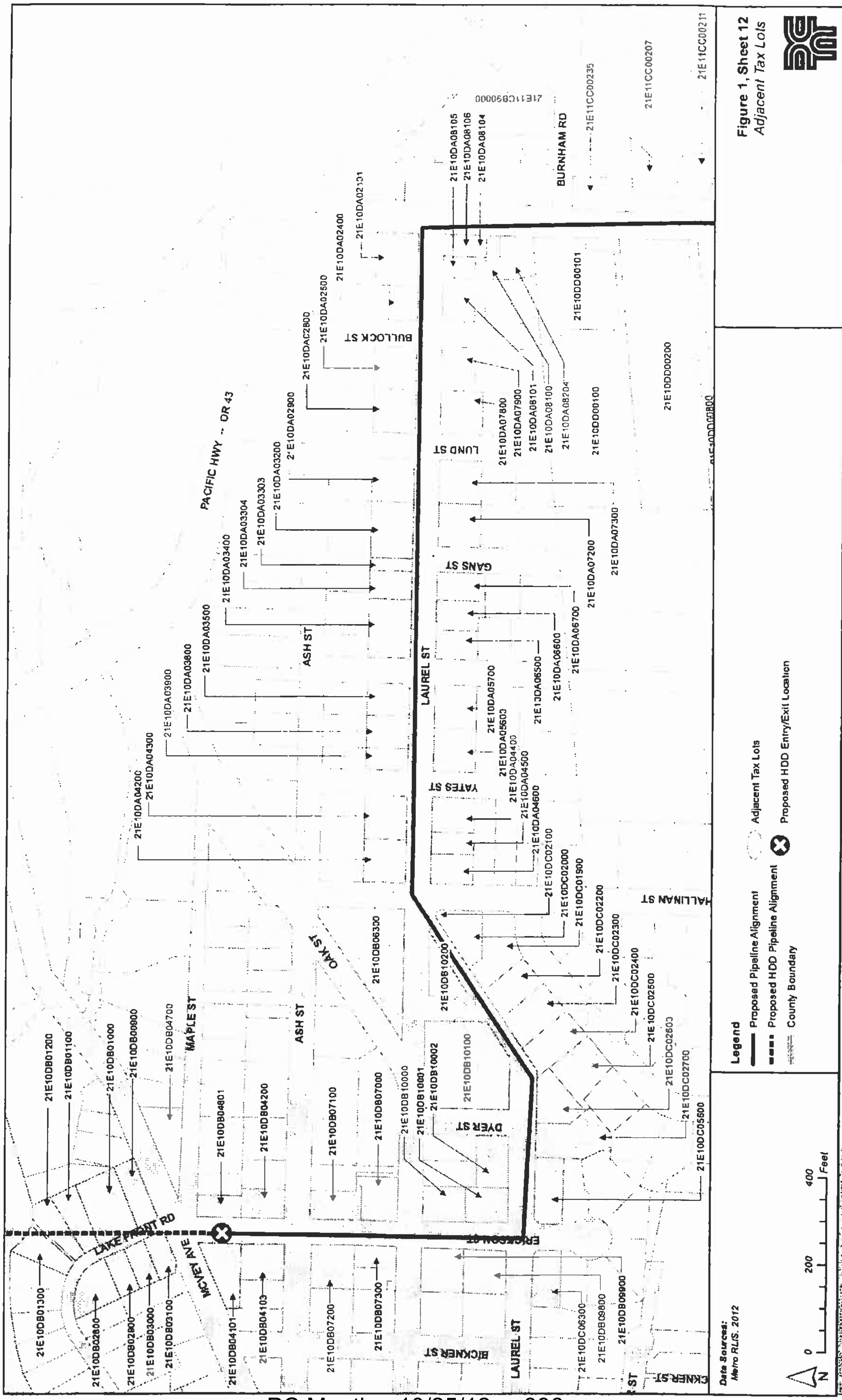
Figure 1, Sheet 12
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
PACIFIC HWY -- OR 43
LAUREL ST
LAKE FRONT RD
MCVEY AVE
ERICKSON ST
BICKNER ST
MAPLE ST
ASH ST
OAK ST
DYER ST
YATES ST
GANS ST
LUND ST
BULLOCK ST
BURNHAM RD
HALLINAN ST

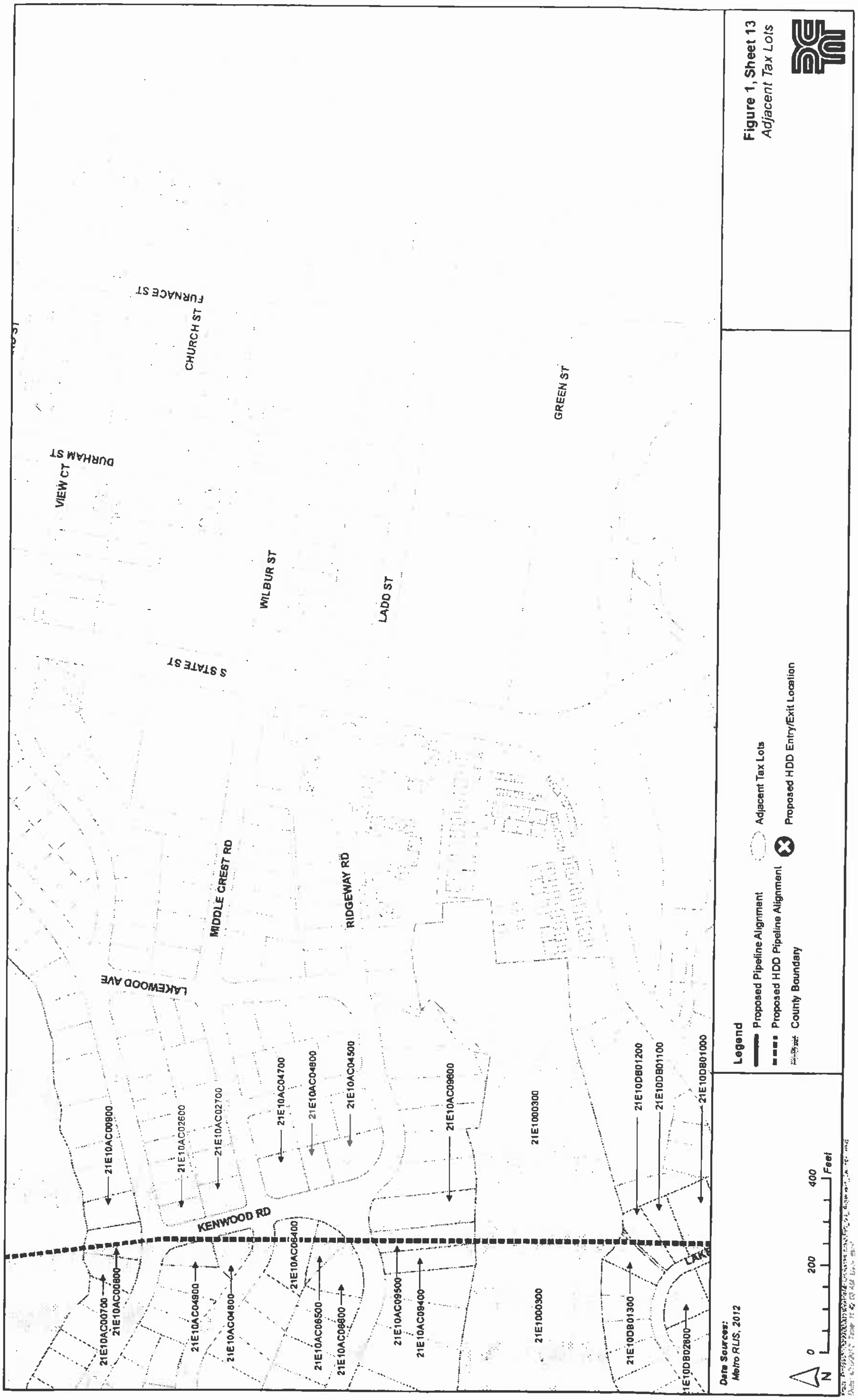

Figure 1, Sheet 13
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
FURNACE ST
CHURCH ST
DURHAM ST
VIEW CT
GREEN ST
WILBUR ST
LADD ST
S STATE ST
MIDDLE CREST RD
RIDGEWAY RD
LAKEWOOD AVE
KENWOOD RD
21E10AC00900
21E10AC02600
21E10AC02700
21E10AC04700
21E10AC04600
21E10AC04500
21E10AC09600
21E1000300
21E10DB01200
21E10DB01100
21E10DB01000
21E10AC00700
21E10AC00800
21E10AC04900
21E10AC04800
21E10AC08400
21E10AC08500
21E10AC08600
21E10AC09500
21E10AC09400
21E1D00300
21E10DB01300
21E10DB02800

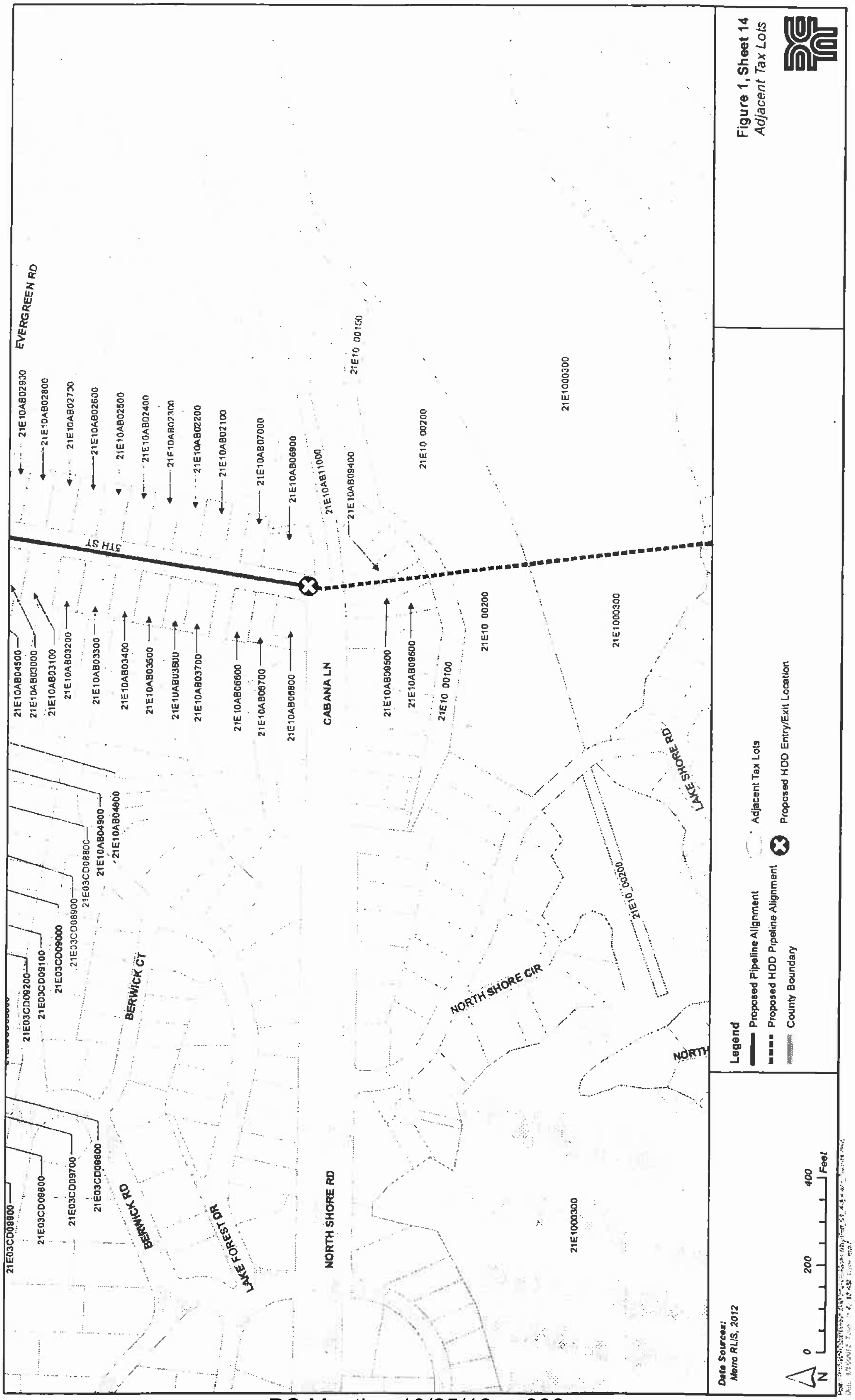
Figure 1, Sheet 14
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
EVERGREEN RD
5TH ST
CABANA LN
NORTH SHORE RD
NORTH SHORE CIR
LAKE SHORE RD
BERWICK CT
BERWICK RD
LAKE FOREST DR
NORTH
21E10AB02900
21E10AB02800
21E10AB02700
21E10AB02600
21E10AB02500
21E10AB02400
21E10AB02300
21E10AB02200
21E10AB02100
21E10AB07000
21E10AB06900
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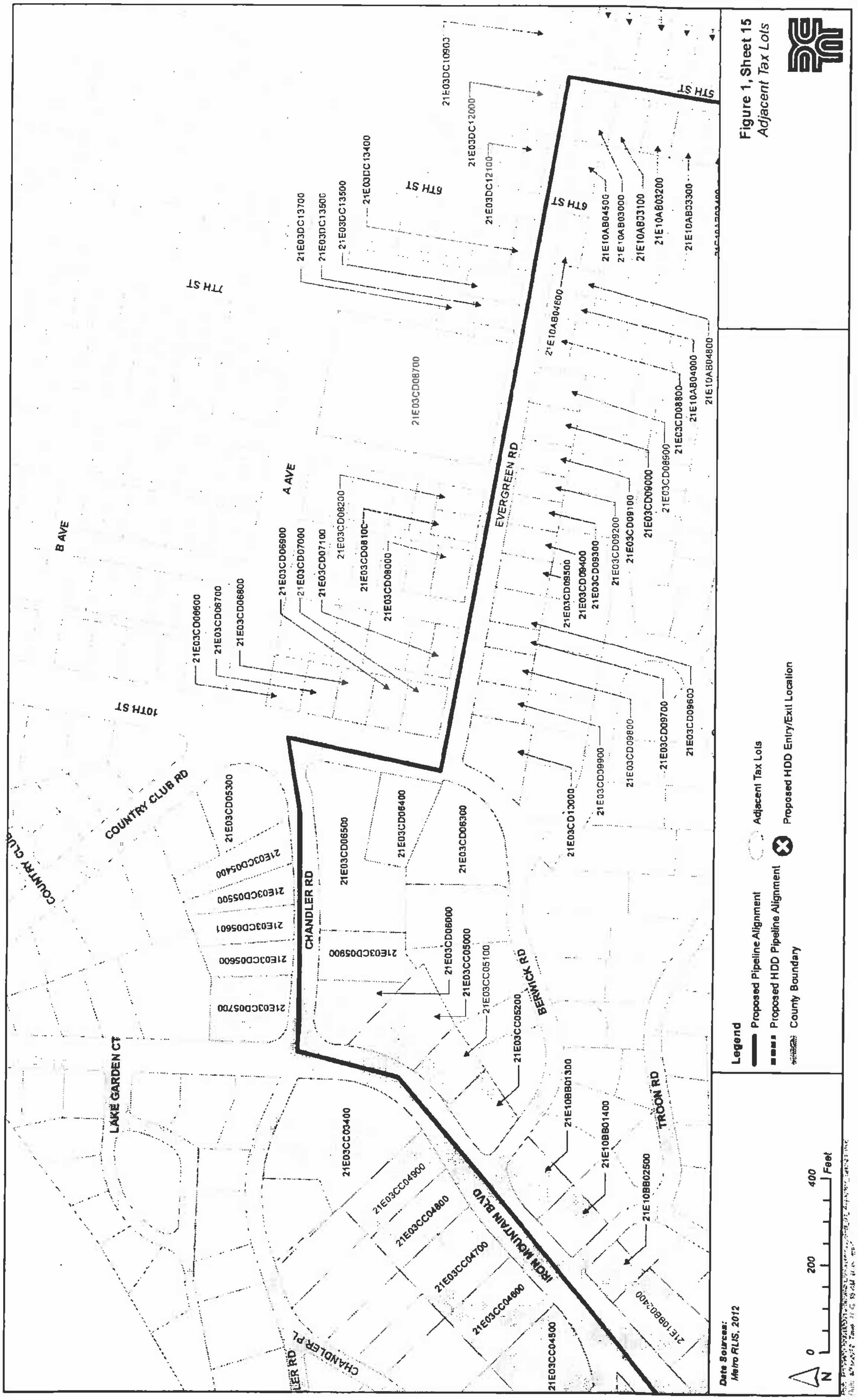

Figure 1, Sheet 15
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources: Metro RLIS, 2012
0
200
400
Feet
N
EVERGREEN RD
CHANDLER RD
IRON MOUNTAIN BLVD
BERWICK RD
TROON RD
COUNTRY CLUB RD
LAKE GARDEN CT
CHANDLER PL
A AVE
B AVE
10TH ST
7TH ST
6TH ST
5TH ST

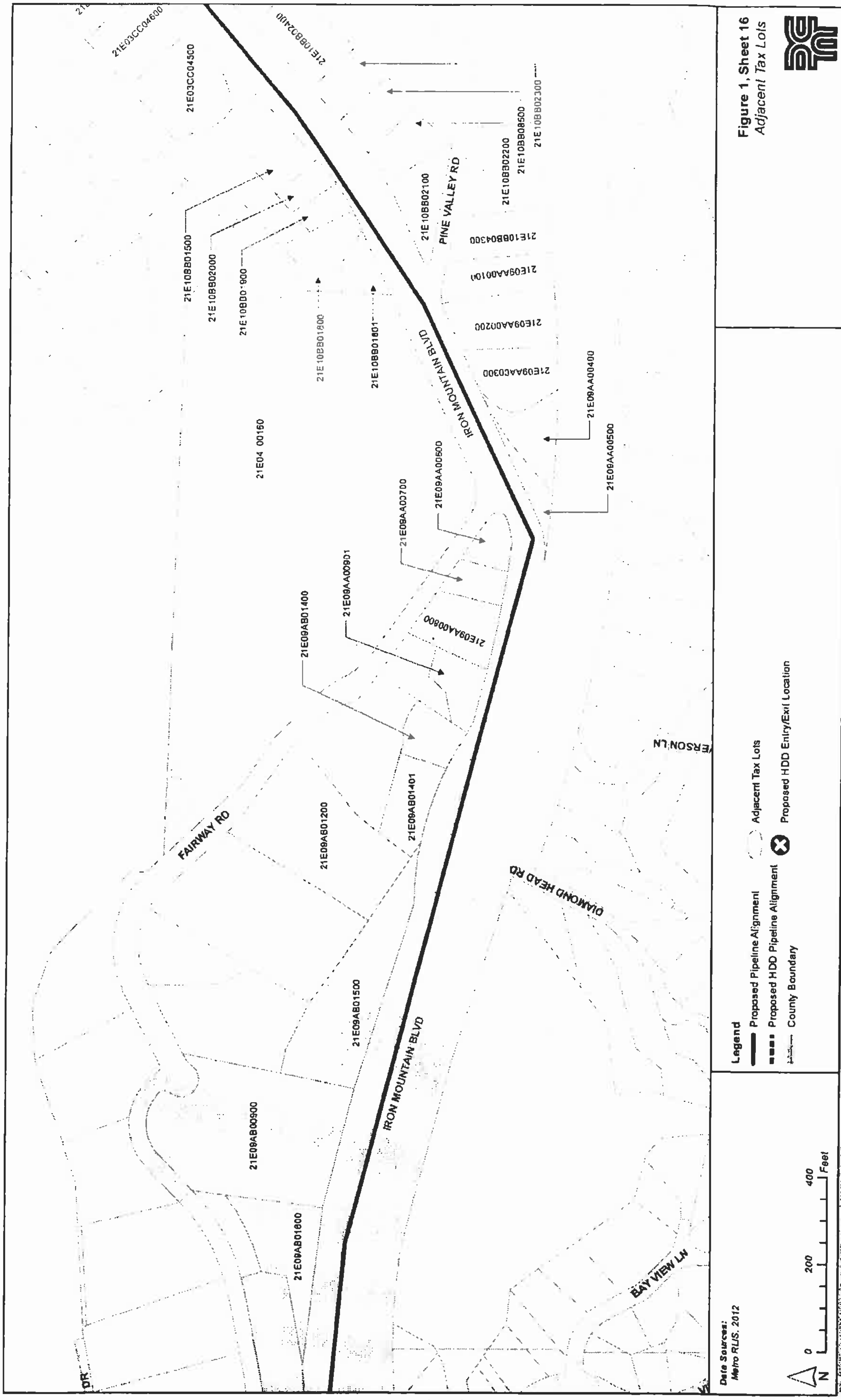
Figure 1, Sheet 16
Adjacent Tax Lots
IRON MOUNTAIN BLVD
PINE VALLEY RD
FAIRWAY RD
DIAMOND HEAD RD
BAY VIEW LN
21E03CC04600
21E03CC04500
21E10BB02400
21E10BB02300
21E10BB08500
21E10BB02200
21E10BB02100
21E10BB04300
21E10BB01500
21E10BB02000
21E10BB01800
21E10BB01801
21E09AA00100
21E09AA00200
21E09AA00300
21E09AA00400
21E09AA00500
21E04 00160
21E09AA00700
21E09AA00901
21E09AA00800
21E09AB01400
21E09AB01401
21E09AB01200
21E09AB01500
21E09AB00900
21E09AB01600
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N

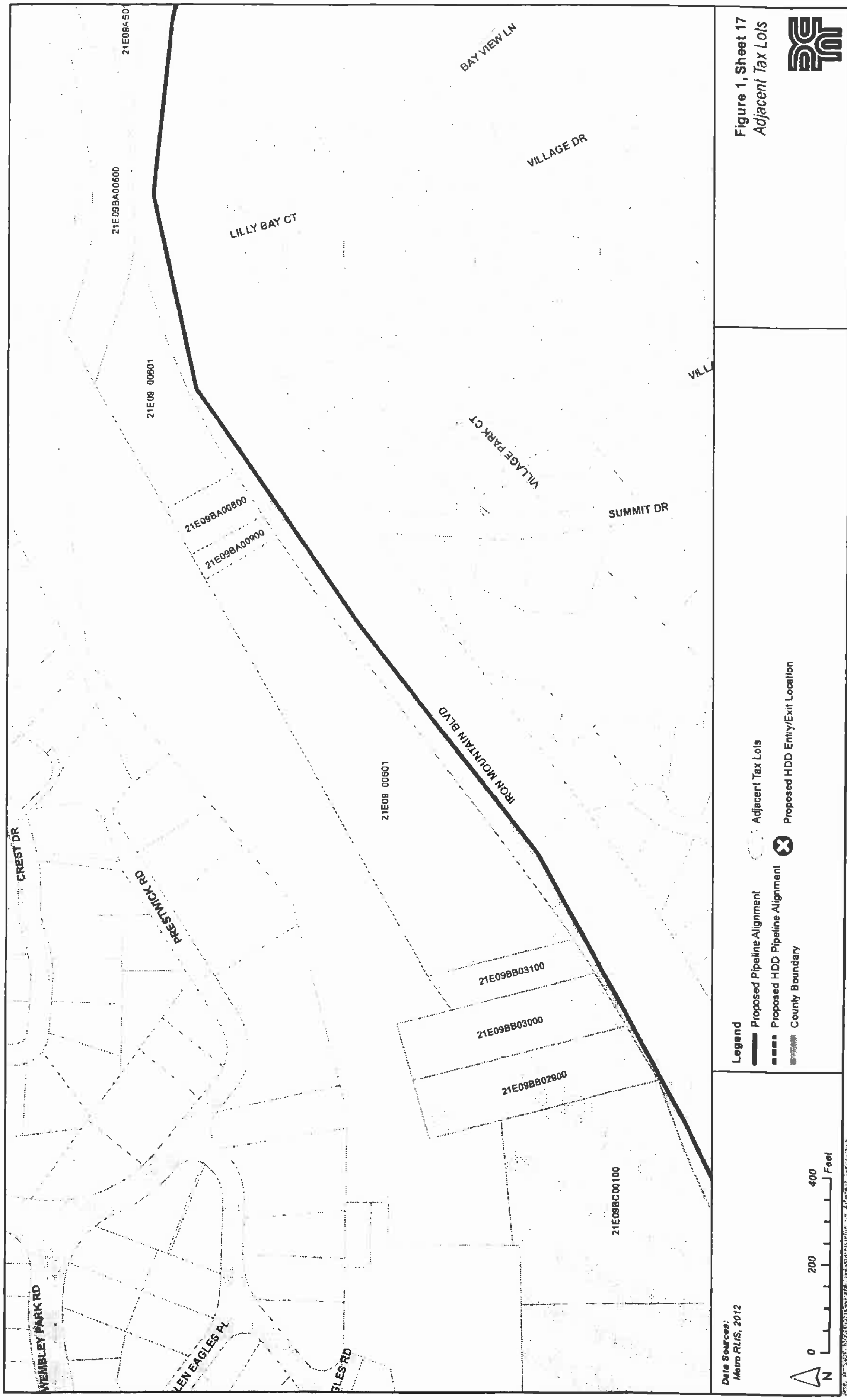
Figure 1, Sheet 17
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
BAY VIEW LN
VILLAGE DR
LILLY BAY CT
VILLAGE PARK CT
SUMMIT DR
IRON MOUNTAIN BLVD
CREST DR
PRESTWICK RD
WEMBLEY PARK RD
LEN EAGLES PL
21E09BA00600
21E09 00601
21E09BA00800
21E09BA00900
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21E09BB02800
21E09BC00100

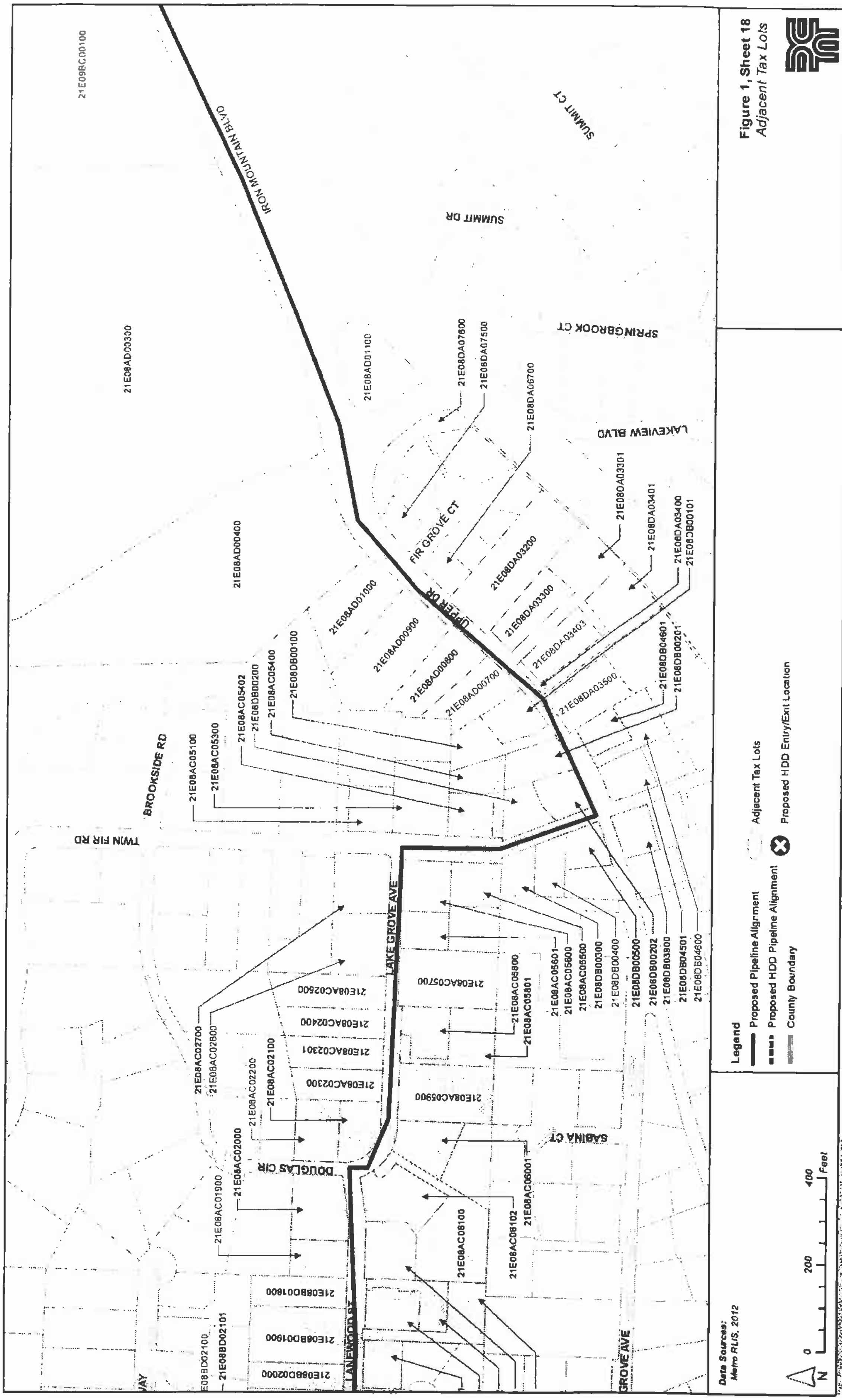
Figure 1, Sheet 18
Adjacent Tax Lots
IRON MOUNTAIN BLVD
SUMMIT CT
SUMMIT DR
SPRINGBROOK CT
LAKEVIEW BLVD
FIR GROVE CT
UPPER DR
BROOKSIDE RD
TWIN FIR RD
LAKE GROVE AVE
DOUGLAS CIR
SABINA CT
LANEWOOD ST
GROVE AVE
21E09BC00100
21E08AD00300
21E08AD00400
21E08AD01100
21E08DA07600
21E08DA07500
21E08DA06700
21E08DA03301
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21E08AC02700
21E08AC02800
21E08AC02500
21E08AC02400
21E08AC02301
21E08AC02300
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21E08AC02100
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21E08AC05700
21E08AC05900
21E08AC05800
21E08AC05801
21E08AC05601
21E08AC05600
21E08AC05500
21E08DB00300
21E08DB00400
21E08DB00500
21E08DB00202
21E08DB03900
21E08DB04501
21E08DB04600
21E08AC06001
21E08AC06102
21E08AC06100
21E08BD01800
21E08BD01900
21E08BD02000
21E08BD02100
21E08BD02101
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N

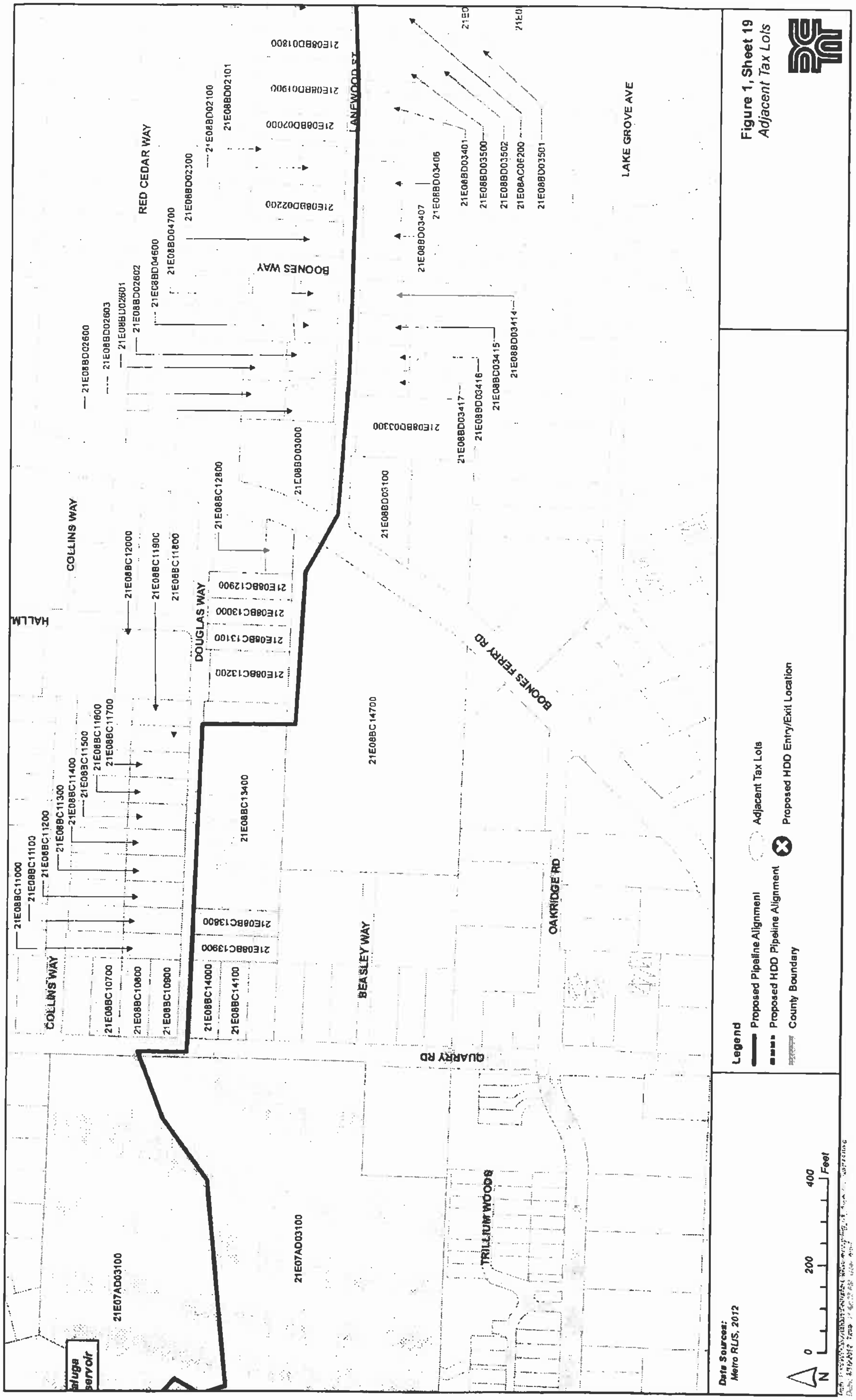
Figure 1, Sheet 19
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
RED CEDAR WAY
BOONES WAY
LANEWOOD ST
LAKE GROVE AVE
COLLINS WAY
HALLM
DOUGLAS WAY
BOONES FERRY RD
BEASLEY WAY
OAKRIDGE RD
QUARRY RD
TRILLIUM WOODS
21E08BD01800
21E08BD01900
21E08BD02000
21E08BD02100
21E08BD02101
21E08BD02200
21E08BD02300
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21E08BD03000
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21E08BC11500
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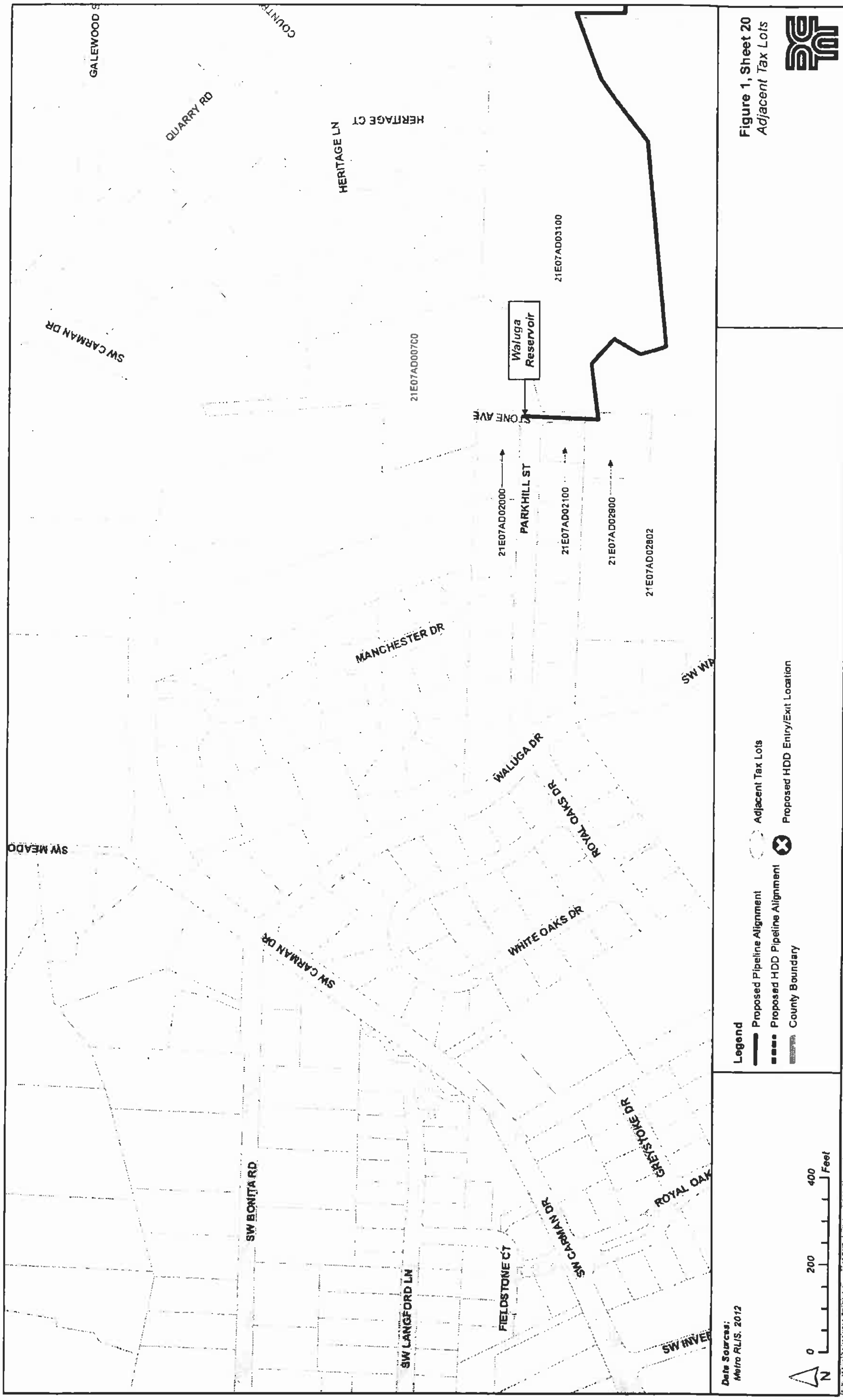
Figure 1, Sheet 20
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
Waluga Reservoir
21E07AD03100
21E07AD007C0
21E07AD02000
21E07AD02100
21E07AD02900
21E07AD02802
GALEWOOD S
QUARRY RD
HERITAGE LN
HERITAGE CT
SW CARMAN DR
STONE AVE
PARKHILL ST
MANCHESTER DR
SW WA
WALUGA DR
ROYAL OAKS DR
SW MEADO
WHITE OAKS DR
GREYSTOKE DR
ROYAL OAK
SW BONITA RD
SW LANGFORD LN
FIELDSTONE CT
SW CARMAN DR
SW INVEF

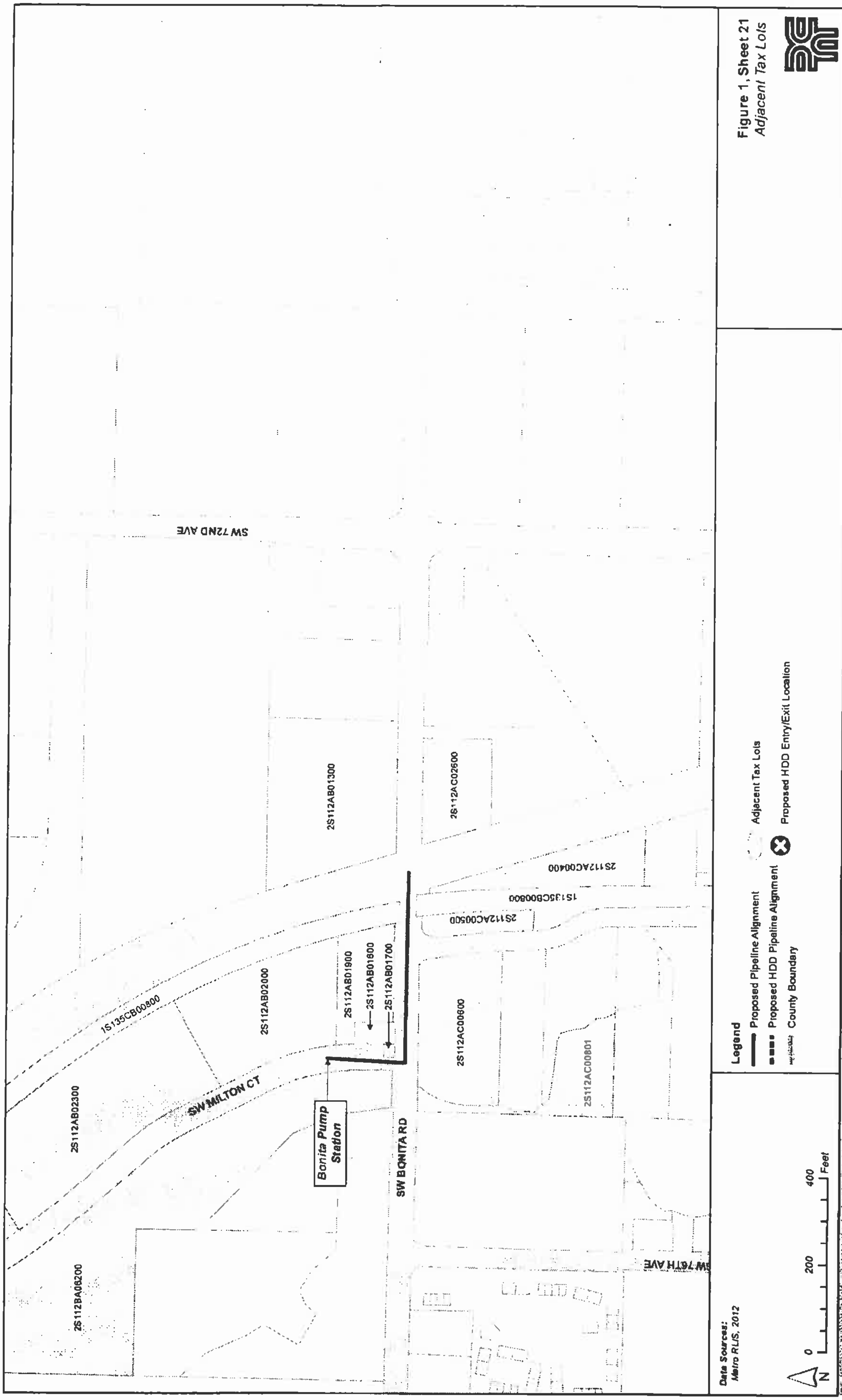

Figure 1, Sheet 21
Adjacent Tax Lots
Legend
Proposed Pipeline Alignment
Proposed HDD Pipeline Alignment
County Boundary
Adjacent Tax Lots
Proposed HDD Entry/Exit Location
Data Sources:
Metro RLIS, 2012
0
200
400
Feet
N
SW 72ND AVE
SW MILTON CT
SW BONITA RD
SW 76TH AVE
Bonita Pump Station
2S112AB01300
2S112AC02600
2S112AC00400
1S135CB00800
2S112AC00500
2S112AB01900
2S112AB01800
2S112AB01700
2S112AB02000
2S112AC00600
2S112AC00801
2S112AB02300
2S112BA08200
1S135CB00800

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DEPARTMENT OF STATE LANDS

DAVID EVANS AND ASSOCIATES INC.

TRANSMITTAL

DATE:	April 19, 2012	**PAGES:**	1
TO:	**Anita Huffman**	**TELEPHONE NO:**	503-986-5250
	Oregon Department of State Lands	**FAX NO:**	
	775 Summer St. NE Suite 100		
	Salem, OR 97301-1279		
FROM:	Ethan Rosenthal	**TELEPHONE NO:**	503.499.0572
		FAX NO:	503.223.2701
PROJECT:	**Lake Oswego-Tigard Water Supply Project**		
PROJECT NO:	**IWSO0000-0001**		

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☐ FOR YOUR INFORMATION ☐ RECORDS MANAGEMENT ☐ FOR YOUR USE

☐ ____

ITEM	COPIES	DATE	DESCRIPTION
1	1		Joint Permit Application

COMMENTS:

Anita,

Enclosed is the Joint Permit Application for the Lake Oswego-Tigard Water Supply Project. The JPA is provided as a final document for DSL review. Payment for review has been sent to DSL P.O. Box 4395, as noted on the JPA form. Please call if you have any questions.

Thank you for your help,

-Ethan

Copies: Karla Ellis (U.S. Army Corps)

File Name: P:\I\IWSO00000001\0300COM\0330Agency\Tr_DSL_Huffman-JPA-4-19-2012.doc

JOINT PERMIT APPLICATION

Final

Date:	April 19, 2012
Prepared for:	Lake Oswego-Tigard Water Partnership
Subject:	Final Joint Permit Application Package
To:	Karla Ellis, Project Manager, Portland District, USACE
	Anita Huffman, Project Manager, DSL
From:	Terry Buchholz, Integrated Water Solution, LLC
Prepared by:	Terry Buchholz, Integrated Water Solution, LLC
	Bob Jossis, Brown and Caldwell
	Loren Stucker, David Evans and Associates, Inc.
	Ethan Rosenthal, David Evans and Associates, Inc.
	Jennifer Miller, David Evans and Associates, Inc.
	David Dekrey, Ellis Ecological Services
	Brad Moore, Kennedy/Jenks
	Pat Van Duser, Black & Veatch
	Corianne Hart, Brown and Caldwell
	Pete Oveson, Brown and Caldwell

Lake Oswego · Tigard Water Partnership
sharing water · connecting communities

Brown Caldwell

CONTENTS

Pelz, Zach

From: gwen sieben [gwensieben@att.net]
Sent: Sunday, October 21, 2012 8:19 PM
To: Pelz, Zach
Subject: Additional testimony for CUP-12-02 and CUP-12-04

To: The West Linn Planning Commission and Zach Pelz:

During my testimony on Thursday, October 19, 2012, regarding CUP-12-02 and CUP-12-04, I referred to an application which the Lake Oswego Tigard Water Partnership submitted to the Department of State Lands on April 20, 2012. I provided two pages from that document with my comments.

Following my testimony, Commissioner Martin requested the entire Department of State Lands application, which is 228 pages long. I have finally been able to locate the digital form of that document, so I am submitting the link below for the entire Planning Commission.

http://docs.dsl.state.or.us/PublicReview/docview.aspx?id=1445106&&dbid=0

Please include this document as additional information to be added to my testimony.

If a paper copy of that document is needed or if the link doesn't work, Mr. Pelz should contact me immediately by email so I can bring the entire document to city offices.

Thank you.

Tom Sieben

Pelz, Zach

From: Gianopoulos Stacey [butterqueen@comcast.net]
Sent: Friday, October 19, 2012 8:57 PM
To: Walters, Rebecca (DS)
Cc: Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mark Mutschler (Drs.mutschler@gmail.com); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Ray and Kim Cozby (rcozby@hotmail.com); Rich Sheu (rickveda22 @yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229 @msn.com); Shane Medberry (shanemedbery@me.com); Shanon Vroman (shanonmv@comcast.net); Sharon Knutson (norahs1344@yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Tom & Gwen Sieben (gwensieben@att.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com)
Subject: Re: sheriff SWAT team

I would add to this the fact that Andy and I have allowed SWAT teams to use our Clackamas facility for training purposes. You may be reading too much into this. As has been stated, it is a routine matter for them....new locations, new terrain & etc.
For further information I can call Tony Kollias, the SWAT team coordinator who signed the letter. I know him personally from other circles.I will forward any information I find out.
Thanks,
Stacey Gianopoulos
On Oct 19, 2012, at 9:08 AM, Walters, Rebecca (DS) wrote:

Zach:

Would you please submit this email and letter to the Planning Commission for the Lake Oswego/Tigard Water Treatment Plant and Pipeline conditional use permits application?

This letter arrived yesterday at my home which is located on Mapleton Drive. This letter is indicative that the WTF/pipeline is a REGIONAL water supply and this letter is SCARY.

Here are a few excerpts but the entire letter is attached for your perusal.

"I am writing this to inform you that the Clackamas County Sheriff's Office Special Weapons and Tactics (SWAT) team plans to train in or near your neighborhood sometime in the next two weeks. .... You can expect to see many patrol cars from various law enforcement agencies within Clackamas County, deputies and police officers wearing heavy vests and helmets as well as several armored vehicles. ... You may hear small reports (pops) from training munitions throughout the day."

Thanks,
Rebecca Walters

<scan0001.pdf>

Pelz, Zach

From: Gianopoulos Stacey [butterqueen@comcast.net]
Sent: Friday, October 19, 2012 8:52 PM
To: Walters, Rebecca (DS)
Cc: Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mark Mutschler (Drs.mutschler@gmail.com); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Ray and Kim Cozby (rcozby@hotmail.com); Rich Sheu (rickveda22 @yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229 @msn.com); Shane Medberry (shanemedbery@me.com); Shanon Vroman (shanonmv@comcast.net); Sharon Knutson (norahs1344@yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Tom & Gwen Sieben (gwensieben@att.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com)
Subject: Re: sheriff SWAT team

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Thanks,

Rebecca Walters

This message and any attachments are intended only for the use of the addressee and may contain information that is privileged and confidential. If the reader of the message is not the intended recipient or an authorized representative of the intended recipient, you are hereby notified that any dissemination of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by e-mail and delete the message and any attachments from your system.
<scan0001.pdf>

Pelz, Zach

From: gwen sieben [gwensieben@att.net]
Sent: Friday, October 19, 2012 6:12 PM
To: shanonmv@comcast.net; Ray and Kim Cozby
Cc: Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Rich Sheu (rickveda22@yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229 @msn.com); Shane Medberry (shanemedbery@me.com); Sharon Knutson (norahs1344 @yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacey Gianopoulis (butterqueen@comcast.net); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com); Rebecca (DS)Walters; Mark & Fariba Mutschler
Subject: RE: sheriff SWAT team

I spent 10 minutes talking to WL police officer Tonkin who knew a little general info about the LOT plant proposal, but I don't think he was clued into the sensitivity neighbors have over this issue. He said their exercise in that location was entirely because a vacant house soon to be demolished provides an excellent opportunity to practice (whatever it is they practice).

I told him people were upset and that folks were concerned about the water plant as a terrorist target. He said the choice of that location for practice had nothing to do with a future water plant in that location. It is so unfortunate that the police don't know enough about the neighborhood to know how edgy people are, especially after being at a serious meeting until 11:00 pm.

So, you are up to date on that issue. I also asked him to practice some traffic maneuvers at Nixon and Mapleton but he said he would forward that to some higher authority.

There you have it!

--- On **Fri, 10/19/12, Ray and Kim Cozby** *<rcozby@hotmail.com>* wrote:

From: Ray and Kim Cozby <rcozby@hotmail.com>
Subject: RE: sheriff SWAT team
To: shanonmv@comcast.net, "gwen sieben" <gwensieben@att.net>
Cc: "Zach (ZPELZ@westlinnoregon.gov)Pelz" <zpelz@westlinnoregon.gov>, "Julie McAdams (juliecmcadams@yahoo.com)" <juliecmcadams@yahoo.com>, "Amanda Davidson (javahag@comcast.net)" <javahag@comcast.net>, "Benjamin Brink (kappa@dekka.com)" <kappa@dekka.com>, "Bob and Muriel Rowning (murbobr@q.com)" <murbobr@q.com>, "Brian and Anna Wheeler (annaw@hevanet.com)" <annaw@hevanet.com>, "Brian Niedermeyer (bniedermeyer@msn.com)" <bniedermeyer@msn.com>, "BrianonMapleton(quetzal.verapaz@gmail.com)" <quetzal.verapaz@gmail.com>, "Casey Davidson (cdavidson@hfflp.com)" <cdavidson@hfflp.com>, "Chuck Landskronercrm (chucklandskronercrm@hotmail.com)" <chucklandskronercrm@hotmail.com>, "Cindy Kauffman (cinkauffman@yahoo.com)" <cinkauffman@yahoo.com>, "Darryl Walters (darryl_walters@comcast.net)" <darryl_walters@comcast.net>, "Dave Froode (dfroode@comcast.net)" <dfroode@comcast.net>, "Eric Jones (ericjones2009@aol.com)" <ericjones2009@aol.com>, "Francisco and Traci Varela (francisco.varela@comcast.net)" <francisco.varela@comcast.net>, "Gary and Judy Emblen(2emblens@comcast.net)" <2emblens@comcast.net>, "Georgia Gavin (glgavin@comcast.net)" <glgavin@comcast.net>, "Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com)" <glendawaddle@greatnorthwestpropertiesmanagement.com>, "Jan and Scott Gerber (jumpin@cmn.net)" <jumpin@cmn.net>, "Jana and Neal Rea (flyartcreations@comcast.net)" <flyartcreations@comcast.net>, "Janet BecketSamStephens (thorfinn@comcast.net)" <thorfinn@comcast.net>, "Jeff Morrison (jeffmorrison@lynninvestments.com)" <jeffmorrison@lynninvestments.com>, "Jenne Henderson (hendersonjj@comcast.net)" <hendersonjj@comcast.net>, "Jerry Henderson (jhenderson@smacna-columbia.org)" <jhenderson@smacna-columbia.org>, justjoanmail@yahoo.com, "Ken Hanawa (kenhanawa@yahoo.com)" <kenhanawa@yahoo.com>, "Kevin Bryck (kevinbryck@comcast.net)" <kevinbryck@comcast.net>, lamontking@comcast.net, "Lin and Cindy Stott (c.stott@comcast.net)" <c.stott@comcast.net>, "Linda Edwards (lindaedwards@clear.net)" <lindaedwards@clear.net>, "Liselotte Sheu (liselotte@dekka.com)" <liselotte@dekka.com>, "Mark Ellsworth (mark.ellsworth@comcast.net)" <mark.ellsworth@comcast.net>, "Mary and Dave Robinson (drcanes14@gmail.com)" <drcanes14@gmail.com>, "Marylee King (maryleek@gmail.com)" <maryleek@gmail.com>, "Mia and Derek Tippner (miatippner@gmail.com)" <miatippner@gmail.com>, "Michael Ragan (mike@workflowpro.net)" <mike@workflowpro.net>, "Mike Cooper (hawkey88@comcast.net)" <hawkey88@comcast.net>, "Mike Patel (munixinc2000@yahoo.com)" <munixinc2000@yahoo.com>, "Natalie Cooper (n.nahey.4.coopers@comcast.net)" <n.nahey.4.coopers@comcast.net>, "Nathalie Christensen (tessamess@gmail.com)" <tessamess@gmail.com>, "Norm King (normbking@gmail.com)" <normbking@gmail.com>, "Pete Bedard (stoplotnow@gmail.com)" <stoplotnow@gmail.com>, "Rachel Yeoh-Hanawa (ryhimm@hotmail.com)" <ryhimm@hotmail.com>, "Rich Sheu (rickveda22@yahoo.com)" <rickveda22@yahoo.com>, "Sam Stephens (sistephe@gapac.com)" <sistephe@gapac.com>, "Scott Ann Reid (sreid_229@msn.com)" <sreid_229@msn.com>, "Shane Medberry (shanemedbery@me.com)" <shanemedbery@me.com>, "Sharon Knutson (norahs1344@yahoo.com)" <norahs1344@yahoo.com>, "Shaun Gavin (spgavin63@gmail.com)" <spgavin63@gmail.com>, "Stacey Gianopoulis (butterqueen@comcast.net)" <butterqueen@comcast.net>, "Stacy Epsteen (sepsteen@comcast.net)" <sepsteen@comcast.net>, "Steve Hopkins (SFHopkins9@aol.com)" <sfhopkins9@aol.com>, "SteveJulieBlake (noelblake@comcast.net)" <noelblake@comcast.net>, "Tara and Ujahn Davisson (tdavisson@gmail.com)" <tdavisson@gmail.com>, "Thomas Holder (thom.holder@comcast.net)" <thom.holder@comcast.net>, "Val Sabo (valariesabo5@hotmail.com)" <valariesabo5@hotmail.com>, "Vicky Smith (patvicsmith@q.com)" <patvicsmith@q.com>, "Viktoriya Yatsula (viktoriyac@gmail.com)" <viktoriyac@gmail.com>, "William J. More (williamjmore@lynnpropertiesllc.com)" <williamjmore@lynnpropertiesllc.com>, "Yvonne Davis (yvonne.davis@tqs.com)" <yvonne.davis@tqs.com>, "Rebecca (DS)Walters" <rebecca.walters@adp.com>, "Mark & Fariba Mutschler" <drs.mutschler@gmail.com>
Date: Friday, October 19, 2012, 4:26 PM

We had a notice from the sheriff's dept in our door yesterday when I got home. It was a well written notice that appeared to be routine and sounded like everyone else in the neighborhood would be given notice. It says it will take place in the next two weeks but that they couldn't give a specific date. I assumed others were notified, sorry about that.
Ray

Date: Fri, 19 Oct 2012 20:46:25 +0000
From: shanonmv@comcast.net
To: gwensieben@att.net
CC: ZPELZ@westlinnoregon.gov; juliecmcadams@yahoo.com; javahag@comcast.net; kappa@dekka.com; murbobr@q.com; annaw@hevanet.com; bniedermeyer@msn.com; quetzal.verapaz@gmail.com; cdavidson@hfflp.com; chucklandskronercrm@hotmail.com; cinkauffman@yahoo.com; darryl_walters@comcast.net; dfroode@comcast.net; ericjones2009@aol.com; francisco.varela@comcast.net; 2emblens@comcast.net; glgavin@comcast.net; glendawaddle@greatnorthwestpropertiesmanagement.com; jumpin@cmn.net; flyartcreations@comcast.net; thorfinn@comcast.net; jeffmorrison@lynninvestments.com; hendersonjj@comcast.net; jhenderson@smacna-columbia.org; justjoanmail@yahoo.com; kenhanawa@yahoo.com; kevinbryck@comcast.net; lamontking@comcast.net; c.stott@comcast.net; lindaedwards@clear.net; liselotte@dekka.com; mark.ellsworth@comcast.net; drcanes14@gmail.com; maryleek@gmail.com; miatippner@gmail.com; mike@workflowpro.net; hawkey88@comcast.net; munixinc2000@yahoo.com; n.nahey.4.coopers@comcast.net; tessamess@gmail.com; normbking@gmail.com; stoplotnow@gmail.com; ryhimm@hotmail.com; rcozby@hotmail.com; rickveda22@yahoo.com; sistephe@gapac.com; sreid_229@msn.com; shanemedbery@me.com; norahs1344@yahoo.com; spgavin63@gmail.com; butterqueen@comcast.net; sepsteen@comcast.net; SFHopkins9@aol.com; noelblake@comcast.net; tdavisson@gmail.com; thom.holder@comcast.net; valariesabo5@hotmail.com; patvicsmith@q.com; viktoriyac@gmail.com; williamjmore@lynnpropertiesllc.com; yvonne.davis@tqs.com; Rebecca.Walters@adp.com; drs.mutschler@gmail.com
Subject: Re: sheriff SWAT team

I would like to step in here and say that I agree with all of you at some level. However, I live in close proximity and received no notice that this training was going on.

When I came down the street today, I saw a sandwich board sign down at the LO lots. I drove down there only to find a parking lot of sheriff, etc. cars and guys in full SWAT gear and attire....that was a scary sight. I think that is the issue. I came upon this without any knowledge of what they were doing there and it was alarming. Kids or elderly or even me, seeing full SWAT attire is alarming. For this I believe notice should have been provided to the entire surrounding community.

Next, if the training was being done because the water treatment plant has become or will become a potential terrorist target and they want to be sure the SWAT teams know the lay of the land...two fold here: There shouldn't be a NEED for a SWAT TEAM to be in our neighborhood so that tells us and should tell the City of West Linn that an industrial water plant of such magnitude, should not be allowed...protect the citizens of our city from what appears may have been deemed a necessary training due to a potential terrorist attack. Second to that, I guess on the flip side, is, if the darn thing ends up being built, I sure as heck want those guys knowing what, where and how to protect us.....it is a sick and twisted place for us all to have to be in; trying to get comfortable with a SWAT team training in our neighborhood. It is a love/hate thing begin forced upon us.

Shanon

From: "gwen sieben" <gwensieben@att.net>
To: "Rebecca (DS)Walters" <Rebecca.Walters@adp.com>, "Mark & Fariba Mutschler" <drs.mutschler@gmail.com>
Cc: "Zach (ZPELZ@westlinnoregon.gov)Pelz" <ZPELZ@westlinnoregon.gov>, "Julie McAdams (juliecmcadams@yahoo.com)" <juliecmcadams@yahoo.com>, "Amanda Davidson (javahag@comcast.net)" <javahag@comcast.net>, "Benjamin Brink (kappa@dekka.com)" <kappa@dekka.com>, "Bob and Muriel Rowning (murbobr@q.com)" <murbobr@q.com>, "Brian and Anna Wheeler (annaw@hevanet.com)" <annaw@hevanet.com>, "Brian Niedermeyer (bniedermeyer@msn.com)" <bniedermeyer@msn.com>, "BrianonMapleton(quetzal.verapaz@gmail.com)" <quetzal.verapaz@gmail.com>, "Casey Davidson (cdavidson@hfflp.com)" <cdavidson@hfflp.com>, "Chuck Landskronercrm (chucklandskronercrm@hotmail.com)" <chucklandskronercrm@hotmail.com>, "Cindy Kauffman (cinkauffman@yahoo.com)" <cinkauffman@yahoo.com>, "Darryl Walters (darryl_walters@comcast.net)" <darryl_walters@comcast.net>, "Dave Froode (dfroode@comcast.net)" <dfroode@comcast.net>, "Eric Jones (ericjones2009@aol.com)" <ericjones2009@aol.com>, "Francisco and Traci Varela (francisco.varela@comcast.net)" <francisco.varela@comcast.net>, "Gary and Judy Emblen(2emblens@comcast.net)" <2emblens@comcast.net>, "Georgia Gavin (glgavin@comcast.net)" <glgavin@comcast.net>, "Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com)" <glendawaddle@greatnorthwestpropertiesmanagement.com>, "Jan and Scott Gerber (jumpin@cmn.net)" <jumpin@cmn.net>, "Jana and Neal Rea (flyartcreations@comcast.net)" <flyartcreations@comcast.net>, "Janet BecketSamStephens (thorfinn@comcast.net)" <thorfinn@comcast.net>, "Jeff Morrison (jeffmorrison@lynninvestments.com)" <jeffmorrison@lynninvestments.com>, "Jenne Henderson (hendersonjj@comcast.net)" <hendersonjj@comcast.net>, "Jerry Henderson (jhenderson@smacna-columbia.org)" <jhenderson@smacna-columbia.org>, justjoanmail@yahoo.com, "Ken Hanawa (kenhanawa@yahoo.com)" <kenhanawa@yahoo.com>, "Kevin Bryck (kevinbryck@comcast.net)" <kevinbryck@comcast.net>, lamontking@comcast.net, "Lin and Cindy Stott (c.stott@comcast.net)" <c.stott@comcast.net>, "Linda Edwards (lindaedwards@clear.net)" <lindaedwards@clear.net>, "Liselotte Sheu (liselotte@dekka.com)" <liselotte@dekka.com>, "Mark Ellsworth (mark.ellsworth@comcast.net)" <mark.ellsworth@comcast.net>, "Mary and Dave Robinson (drcanes14@gmail.com)" <drcanes14@gmail.com>, "Marylee King (maryleek@gmail.com)" <maryleek@gmail.com>, "Mia and Derek Tippner (miatippner@gmail.com)" <miatippner@gmail.com>, "Michael Ragan (mike@workflowpro.net)" <mike@workflowpro.net>, "Mike Cooper (hawkey88@comcast.net)" <hawkey88@comcast.net>, "Mike Patel (munixinc2000@yahoo.com)" <munixinc2000@yahoo.com>, "Natalie Cooper (n.nahey.4.coopers@comcast.net)" <n.nahey.4.coopers@comcast.net>, "Nathalie Christensen (tessamess@gmail.com)" <tessamess@gmail.com>, "Norm King (normbking@gmail.com)" <normbking@gmail.com>, "Pete Bedard (stoplotnow@gmail.com)" <stoplotnow@gmail.com>, "Rachel Yeoh-Hanawa (ryhimm@hotmail.com)" <ryhimm@hotmail.com>, "Ray and Kim Cozby (rcozby@hotmail.com)" <rcozby@hotmail.com>, "Rich Sheu (rickveda22@yahoo.com)" <rickveda22@yahoo.com>, "Sam Stephens (sistephe@gapac.com)" <sistephe@gapac.com>, "Scott Ann Reid (sreid_229@msn.com)" <sreid_229@msn.com>, "Shane Medberry (shanemedbery@me.com)" <shanemedbery@me.com>, "Shanon Vroman (shanonmv@comcast.net)" <shanonmv@comcast.net>, "Sharon Knutson (norahs1344@yahoo.com)" <norahs1344@yahoo.com>, "Shaun Gavin (spgavin63@gmail.com)" <spgavin63@gmail.com>, "Stacey Gianopoulis (butterqueen@comcast.net)" <butterqueen@comcast.net>, "Stacy Epsteen (sepsteen@comcast.net)" <sepsteen@comcast.net>, "Steve Hopkins (SFHopkins9@aol.com)" <SFHopkins9@aol.com>, "SteveJulieBlake

(noelblake@comcast.net)" <noelblake@comcast.net>, "Tara and Ujahn Davisson (tdavisson@gmail.com)" <tdavisson@gmail.com>, "Thomas Holder (thom.holder@comcast.net)" <thom.holder@comcast.net>, "Val Sabo (valariesabo5@hotmail.com)" <valariesabo5@hotmail.com>, "Vicky Smith (patvicsmith@q.com)" <patvicsmith@q.com>, "Viktoriya Yatsula (viktoriyac@gmail.com)" <viktoriyac@gmail.com>, "William J. More (williamjmore@lynnpropertiesllc.com)" <williamjmore@lynnpropertiesllc.com>, "Yvonne Davis (yvonne.davis@tqs.com)" <yvonne.davis@tqs.com>
Sent: Friday, October 19, 2012 1:05:54 PM
Subject: Re: FW: sheriff SWAT team

Not knowing this was coming is definitely scary and with everyone so sensitive about those lots, the largest group of neighbors should have been notified with specifics.

However, I do agree with Drs. Mutschler. The more the public safety folks get familiar with Mapleton the better. As they are finishing up, they should also practice negotiating the intersection of Nixon/Mapleton, especially turning right off of Nixon while other vehicles are coming both ways on Mapleton. (Yikes!.)

--- On **Fri, 10/19/12, Mark & Fariba Mutschler** ***<drs.mutschler@gmail.com>*** wrote:

From: Mark & Fariba Mutschler <drs.mutschler@gmail.com>
Subject: Re: FW: sheriff SWAT team
To: "Walters, Rebecca (DS)" <Rebecca.Walters@adp.com>
Cc: "Pelz, Zach (ZPELZ@westlinnoregon.gov)" <ZPELZ@westlinnoregon.gov>, "Julie McAdams (juliecmcadams@yahoo.com)" <juliecmcadams@yahoo.com>, "Amanda Davidson (javahag@comcast.net)" <javahag@comcast.net>, "Benjamin Brink (kappa@dekka.com)" <kappa@dekka.com>, "Bob and Muriel Rowning (murbobr@q.com)" <murbobr@q.com>, "Brian and Anna Wheeler (annaw@hevanet.com)" <annaw@hevanet.com>, "Brian Niedermeyer (bniedermeyer@msn.com)" <bniedermeyer@msn.com>, "BrianonMapleton(quetzal.verapaz@gmail.com)" <quetzal.verapaz@gmail.com>, "Casey Davidson (cdavidson@hfflp.com)" <cdavidson@hfflp.com>, "Chuck Landskronercrm (chucklandskronercrm@hotmail.com)" <chucklandskronercrm@hotmail.com>, "Cindy Kauffman (cinkauffman@yahoo.com)" <cinkauffman@yahoo.com>, "Darryl Walters (darryl_walters@comcast.net)" <darryl_walters@comcast.net>, "Dave Froode (dfroode@comcast.net)" <dfroode@comcast.net>, "Eric Jones (ericjones2009@aol.com)" <ericjones2009@aol.com>, "Francisco and Traci Varela (francisco.varela@comcast.net)" <francisco.varela@comcast.net>, "Gary and Judy Emblen(2emblens@comcast.net)" <2emblens@comcast.net>, "Georgia Gavin (glgavin@comcast.net)" <glgavin@comcast.net>, "Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com)" <glendawaddle@greatnorthwestpropertiesmanagement.com>, "Jan and Scott Gerber (jumpin@cmn.net)" <jumpin@cmn.net>, "Jana and Neal Rea (flyartcreations@comcast.net)" <flyartcreations@comcast.net>, "Janet BecketSamStephens (thorfinn@comcast.net)" <thorfinn@comcast.net>, "Jeff Morrison (jeffmorrison@lynninvestments.com)" <jeffmorrison@lynninvestments.com>, "Jenne Henderson (hendersonjj@comcast.net)" <hendersonjj@comcast.net>, "Jerry Henderson (jhenderson@smacna-columbia.org)" <jhenderson@smacna-columbia.org>, "justjoanmail@yahoo.com" <justjoanmail@yahoo.com>, "Ken Hanawa (kenhanawa@yahoo.com)" <kenhanawa@yahoo.com>, "Kevin Bryck (kevinbryck@comcast.net)" <kevinbryck@comcast.net>, "lamontking@comcast.net" <lamontking@comcast.net>, "Lin and Cindy Stott (c.stott@comcast.net)" <c.stott@comcast.net>, "Linda Edwards (lindaedwards@clear.net)" <lindaedwards@clear.net>, "Liselotte Sheu (liselotte@dekka.com)" <liselotte@dekka.com>, "Mark Ellsworth (mark.ellsworth@comcast.net)" <mark.ellsworth@comcast.net>, "Mary and Dave Robinson (drcanes14@gmail.com)" <drcanes14@gmail.com>, "Marylee King (maryleek@gmail.com)" <maryleek@gmail.com>, "Mia and Derek Tippner (miatippner@gmail.com)" <miatippner@gmail.com>, "Michael Ragan (mike@workflowpro.net)" <mike@workflowpro.net>, "Mike Cooper (hawkey88@comcast.net)" <hawkey88@comcast.net>, "Mike Patel (munixinc2000@yahoo.com)"

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Date: Friday, October 19, 2012, 12:45 PM

I have no problem with our first responders training on Mapleton.

Personally, I am glad that our law enforcement officers (and the fire fighters about a month ago) are able to train in abandoned houses to keep up their skills in a relatively safe environment. Having them in our neighborhood can only help with their knowledge of where we are and what the community is like so if there ever IS an emergency, they know their way around.

Mark Mutschler

On Fri, Oct 19, 2012 at 9:08 AM, Walters, Rebecca (DS) <Rebecca.Walters@adp.com> wrote:

Zach:

Would you please submit this email and letter to the Planning Commission for the Lake Oswego/Tigard Water Treatment Plant and Pipeline conditional use permits application?

This letter arrived yesterday at my home which is located on Mapleton Drive. This letter is indicative that the WTF/pipeline is a REGIONAL water supply and this letter is SCARY.

Here are a few excerpts but the entire letter is attached for your perusal.

"I am writing this to inform you that the Clackamas County Sheriff's Office Special Weapons and Tactics (SWAT) team plans to train in or near your neighborhood sometime in the next two weeks. .... You can expect to see many patrol cars from various law enforcement agencies within Clackamas County, deputies and police officers wearing heavy vests and helmets as well as several armored vehicles. … You may hear small reports (pops) from training munitions throughout the day."

Thanks,

Rebecca Walters

Pelz, Zach

From:	Ray and Kim Cozby [rcozby@hotmail.com]
Sent:	Friday, October 19, 2012 4:27 PM
To:	shanonmv@comcast.net; gwen sieben
Cc:	Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Rich Sheu (rickveda22@yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229 @msn.com); Shane Medberry (shanemedbery@me.com); Sharon Knutson (norahs1344 @yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacey Gianopoulis (butterqueen@comcast.net); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com); Rebecca (DS)Walters; Mark & Fariba Mutschler
Subject:	RE: sheriff SWAT team

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Ray

Date: Fri, 19 Oct 2012 20:46:25 +0000
From: shanonmv@comcast.net
To: gwensieben@att.net
CC: ZPELZ@westlinnoregon.gov; juliecmcadams@yahoo.com; javahag@comcast.net; kappa@dekka.com; murbobr@q.com; annaw@hevanet.com; bniedermeyer@msn.com; quetzal.verapaz@gmail.com; cdavidson@hfflp.com; chucklandskronercrm@hotmail.com; cinkauffman@yahoo.com; darryl_walters@comcast.net; dfroode@comcast.net; ericjones2009@aol.com; francisco.varela@comcast.net; 2emblens@comcast.net; glgavin@comcast.net; glendawaddle@greatnorthwestpropertiesmanagement.com; jumpin@cmn.net; flyartcreations@comcast.net; thorfinn@comcast.net; jeffmorrison@lynninvestments.com; hendersonjj@comcast.net; jhenderson@smacna-columbia.org; justjoanmail@yahoo.com; kenhanawa@yahoo.com; kevinbryck@comcast.net; lamontking@comcast.net; c.stott@comcast.net; lindaedwards@clear.net; liselotte@dekka.com; mark.ellsworth@comcast.net; drcanes14@gmail.com; maryleek@gmail.com; miatippner@gmail.com; mike@workflowpro.net; hawkey88@comcast.net; munixinc2000@yahoo.com; n.nahey.4.coopers@comcast.net; tessamess@gmail.com; normbking@gmail.com; stoplotnow@gmail.com; ryhimm@hotmail.com; rcozby@hotmail.com; rickveda22@yahoo.com; sistephe@gapac.com;

sreid_229@msn.com; shanemedbery@me.com; norahs1344@yahoo.com; spgavin63@gmail.com; butterqueen@comcast.net; sepsteen@comcast.net; SFHopkins9@aol.com; noelblake@comcast.net; tdavisson@gmail.com; thom.holder@comcast.net; valariesabo5@hotmail.com; patvicsmith@q.com; viktoriyac@gmail.com; williamjmore@lynnpropertiesllc.com; yvonne.davis@tqs.com; Rebecca.Walters@adp.com; drs.mutschler@gmail.com
Subject: Re: sheriff SWAT team

I would like to step in here and say that I agree with all of you at some level. However, I live in close proximity and received no notice that this training was going on.

When I came down the street today, I saw a sandwich board sign down at the LO lots. I drove down there only to find a parking lot of sheriff, etc. cars and guys in full SWAT gear and attire....that was a scary sight. I think that is the issue. I came upon this without any knowledge of what they were doing there and it was alarming. Kids or elderly or even me, seeing full SWAT attire is alarming. For this I believe notice should have been provided to the entire surrounding community.

Next, if the training was being done because the water treatment plant has become or will become a potential terrorist target and they want to be sure the SWAT teams know the lay of the land...two fold here: There shouldn't be a NEED for a SWAT TEAM to be in our neighborhood so that tells us and should tell the City of West Linn that an industrial water plant of such magnitude, should not be allowed...protect the citizens of our city from what appears may have been deemed a necessary training due to a potential terrorist attack. Second to that, I guess on the flip side, is, if the darn thing ends up being built, I sure as heck want those guys knowing what, where and how to protect us.....it is a sick and twisted place for us all to have to be in; trying to get comfortable with a SWAT team training in our neighborhood. It is a love/hate thing begin forced upon us.

Shanon

From: "gwen sieben" <gwensieben@att.net>
To: "Rebecca (DS)Walters" <Rebecca.Walters@adp.com>, "Mark & Fariba Mutschler" <drs.mutschler@gmail.com>
Cc: "Zach (ZPELZ@westlinnoregon.gov)Pelz" <ZPELZ@westlinnoregon.gov>, "Julie McAdams (juliecmcadams@yahoo.com)" <juliecmcadams@yahoo.com>, "Amanda Davidson (javahag@comcast.net)" <javahag@comcast.net>, "Benjamin Brink (kappa@dekka.com)" <kappa@dekka.com>, "Bob and Muriel Rowning (murbobr@q.com)" <murbobr@q.com>, "Brian and Anna Wheeler (annaw@hevanet.com)" <annaw@hevanet.com>, "Brian Niedermeyer (bniedermeyer@msn.com)" <bniedermeyer@msn.com>, "BrianonMapleton(quetzal.verapaz@gmail.com)" <quetzal.verapaz@gmail.com>, "Casey Davidson (cdavidson@hfflp.com)" <cdavidson@hfflp.com>, "Chuck Landskronercrm (chucklandskronercrm@hotmail.com)" <chucklandskronercrm@hotmail.com>, "Cindy Kauffman (cinkauffman@yahoo.com)" <cinkauffman@yahoo.com>, "Darryl Walters (darryl_walters@comcast.net)" <darryl_walters@comcast.net>, "Dave Froode (dfroode@comcast.net)" <dfroode@comcast.net>, "Eric Jones (ericjones2009@aol.com)" <ericjones2009@aol.com>, "Francisco and Traci Varela (francisco.varela@comcast.net)" <francisco.varela@comcast.net>, "Gary and Judy Emblen(2emblens@comcast.net)" <2emblens@comcast.net>, "Georgia Gavin (glgavin@comcast.net)" <glgavin@comcast.net>, "Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com)" <glendawaddle@greatnorthwestpropertiesmanagement.com>, "Jan and Scott Gerber (jumpin@cmn.net)" <jumpin@cmn.net>, "Jana and Neal Rea (flyartcreations@comcast.net)"

<flyartcreations@comcast.net>, "Janet BecketSamStephens (thorfinn@comcast.net)" <thorfinn@comcast.net>, "Jeff Morrison (jeffmorrison@lynninvestments.com)" <jeffmorrison@lynninvestments.com>, "Jenne Henderson (hendersonjj@comcast.net)" <hendersonjj@comcast.net>, "Jerry Henderson (jhenderson@smacna-columbia.org)" <jhenderson@smacna-columbia.org>, justjoanmail@yahoo.com, "Ken Hanawa (kenhanawa@yahoo.com)" <kenhanawa@yahoo.com>, "Kevin Bryck (kevinbryck@comcast.net)" <kevinbryck@comcast.net>, lamontking@comcast.net, "Lin and Cindy Stott (c.stott@comcast.net)" <c.stott@comcast.net>, "Linda Edwards (lindaedwards@clear.net)" <lindaedwards@clear.net>, "Liselotte Sheu (liselotte@dekka.com)" <liselotte@dekka.com>, "Mark Ellsworth (mark.ellsworth@comcast.net)" <mark.ellsworth@comcast.net>, "Mary and Dave Robinson (drcanes14@gmail.com)" <drcanes14@gmail.com>, "Marylee King (maryleek@gmail.com)" <maryleek@gmail.com>, "Mia and Derek Tippner (miatippner@gmail.com)" <miatippner@gmail.com>, "Michael Ragan (mike@workflowpro.net)" <mike@workflowpro.net>, "Mike Cooper (hawkey88@comcast.net)" <hawkey88@comcast.net>, "Mike Patel (munixinc2000@yahoo.com)" <munixinc2000@yahoo.com>, "Natalie Cooper (n.nahey.4.coopers@comcast.net)" <n.nahey.4.coopers@comcast.net>, "Nathalie Christensen (tessamess@gmail.com)" <tessamess@gmail.com>, "Norm King (normbking@gmail.com)" <normbking@gmail.com>, "Pete Bedard (stoplotnow@gmail.com)" <stoplotnow@gmail.com>, "Rachel Yeoh-Hanawa (ryhimm@hotmail.com)" <ryhimm@hotmail.com>, "Ray and Kim Cozby (rcozby@hotmail.com)" <rcozby@hotmail.com>, "Rich Sheu (rickveda22@yahoo.com)" <rickveda22@yahoo.com>, "Sam Stephens (sistephe@gapac.com)" <sistephe@gapac.com>, "Scott Ann Reid (sreid_229@msn.com)" <sreid_229@msn.com>, "Shane Medberry (shanemedbery@me.com)" <shanemedbery@me.com>, "Shanon Vroman (shanonmv@comcast.net)" <shanonmv@comcast.net>, "Sharon Knutson (norahs1344@yahoo.com)" <norahs1344@yahoo.com>, "Shaun Gavin (spgavin63@gmail.com)" <spgavin63@gmail.com>, "Stacey Gianopoulis (butterqueen@comcast.net)" <butterqueen@comcast.net>, "Stacy Epsteen (sepsteen@comcast.net)" <sepsteen@comcast.net>, "Steve Hopkins (SFHopkins9@aol.com)" <SFHopkins9@aol.com>, "SteveJulieBlake (noelblake@comcast.net)" <noelblake@comcast.net>, "Tara and Ujahn Davisson (tdavisson@gmail.com)" <tdavisson@gmail.com>, "Thomas Holder (thom.holder@comcast.net)" <thom.holder@comcast.net>, "Val Sabo (valariesabo5@hotmail.com)" <valariesabo5@hotmail.com>, "Vicky Smith (patvicsmith@q.com)" <patvicsmith@q.com>, "Viktoriya Yatsula (viktoriyac@gmail.com)" <viktoriyac@gmail.com>, "William J. More (williamjmore@lynnpropertiesllc.com)" <williamjmore@lynnpropertiesllc.com>, "Yvonne Davis (yvonne.davis@tqs.com)" <yvonne.davis@tqs.com>
Sent: Friday, October 19, 2012 1:05:54 PM
Subject: Re: FW: sheriff SWAT team

Not knowing this was coming is definitely scary and with everyone so sensitive about those lots, the largest group of neighbors should have been notified with specifics.

However, I do agree with Drs. Mutschler. The more the public safety folks get familiar with Mapleton the better. As they are finishing up, they should also practice negotiating the intersection of Nixon/Mapleton, especially turning right off of Nixon while other vehicles are coming both ways on Mapleton. (Yikes!.)

--- On **Fri, 10/19/12, Mark & Fariba Mutschler** ***<drs.mutschler@gmail.com>*** wrote:

From: Mark & Fariba Mutschler <drs.mutschler@gmail.com>
Subject: Re: FW: sheriff SWAT team
To: "Walters, Rebecca (DS)" <Rebecca.Walters@adp.com>
Cc: "Pelz, Zach (ZPELZ@westlinnoregon.gov)" <ZPELZ@westlinnoregon.gov>, "Julie McAdams

(juliecmcadams@yahoo.com)" <juliecmcadams@yahoo.com>, "Amanda Davidson (javahag@comcast.net)" <javahag@comcast.net>, "Benjamin Brink (kappa@dekka.com)" <kappa@dekka.com>, "Bob and Muriel Rowning (murbobr@q.com)" <murbobr@q.com>, "Brian and Anna Wheeler (annaw@hevanet.com)" <annaw@hevanet.com>, "Brian Niedermeyer (bniedermeyer@msn.com)" <bniedermeyer@msn.com>, "BrianonMapleton(quetzal.verapaz@gmail.com)" <quetzal.verapaz@gmail.com>, "Casey Davidson (cdavidson@hfflp.com)" <cdavidson@hfflp.com>, "Chuck Landskronercrm (chucklandskronercrm@hotmail.com)" <chucklandskronercrm@hotmail.com>, "Cindy Kauffman (cinkauffman@yahoo.com)" <cinkauffman@yahoo.com>, "Darryl Walters (darryl_walters@comcast.net)" <darryl_walters@comcast.net>, "Dave Froode (dfroode@comcast.net)" <dfroode@comcast.net>, "Eric Jones (ericjones2009@aol.com)" <ericjones2009@aol.com>, "Francisco and Traci Varela (francisco.varela@comcast.net)" <francisco.varela@comcast.net>, "Gary and Judy Emblen(2emblens@comcast.net)" <2emblens@comcast.net>, "Georgia Gavin (glgavin@comcast.net)" <glgavin@comcast.net>, "Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com)" <glendawaddle@greatnorthwestpropertiesmanagement.com>, "Jan and Scott Gerber (jumpin@cmn.net)" <jumpin@cmn.net>, "Jana and Neal Rea (flyartcreations@comcast.net)" <flyartcreations@comcast.net>, "Janet BecketSamStephens (thorfinn@comcast.net)" <thorfinn@comcast.net>, "Jeff Morrison (jeffmorrison@lynninvestments.com)" <jeffmorrison@lynninvestments.com>, "Jenne Henderson (hendersonjj@comcast.net)" <hendersonjj@comcast.net>, "Jerry Henderson (jhenderson@smacna-columbia.org)" <jhenderson@smacna-columbia.org>, "justjoanmail@yahoo.com" <justjoanmail@yahoo.com>, "Ken Hanawa (kenhanawa@yahoo.com)" <kenhanawa@yahoo.com>, "Kevin Bryck (kevinbryck@comcast.net)" <kevinbryck@comcast.net>, "lamontking@comcast.net" <lamontking@comcast.net>, "Lin and Cindy Stott (c.stott@comcast.net)" <c.stott@comcast.net>, "Linda Edwards (lindaedwards@clear.net)" <lindaedwards@clear.net>, "Liselotte Sheu (liselotte@dekka.com)" <liselotte@dekka.com>, "Mark Ellsworth (mark.ellsworth@comcast.net)" <mark.ellsworth@comcast.net>, "Mary and Dave Robinson (drcanes14@gmail.com)" <drcanes14@gmail.com>, "Marylee King (maryleek@gmail.com)" <maryleek@gmail.com>, "Mia and Derek Tippner (miatippner@gmail.com)" <miatippner@gmail.com>, "Michael Ragan (mike@workflowpro.net)" <mike@workflowpro.net>, "Mike Cooper (hawkey88@comcast.net)" <hawkey88@comcast.net>, "Mike Patel (munixinc2000@yahoo.com)" <munixinc2000@yahoo.com>, "Natalie Cooper (n.nahey.4.coopers@comcast.net)" <n.nahey.4.coopers@comcast.net>, "Nathalie Christensen (tessamess@gmail.com)" <tessamess@gmail.com>, "Norm King (normbking@gmail.com)" <normbking@gmail.com>, "Pete Bedard (stoplotnow@gmail.com)" <stoplotnow@gmail.com>, "Rachel Yeoh-Hanawa (ryhimm@hotmail.com)" <ryhimm@hotmail.com>, "Ray and Kim Cozby (rcozby@hotmail.com)" <rcozby@hotmail.com>, "Rich Sheu (rickveda22@yahoo.com)" <rickveda22@yahoo.com>, "Sam Stephens (sistephe@gapac.com)" <sistephe@gapac.com>, "Scott Ann Reid (sreid_229@msn.com)" <sreid_229@msn.com>, "Shane Medberry (shanemedbery@me.com)" <shanemedbery@me.com>, "Shanon Vroman (shanonmv@comcast.net)" <shanonmv@comcast.net>, "Sharon Knutson (norahs1344@yahoo.com)" <norahs1344@yahoo.com>, "Shaun Gavin (spgavin63@gmail.com)" <spgavin63@gmail.com>, "Stacey Gianopoulis (butterqueen@comcast.net)" <butterqueen@comcast.net>, "Stacy Epsteen (sepsteen@comcast.net)" <sepsteen@comcast.net>, "Steve Hopkins (SFHopkins9@aol.com)" <SFHopkins9@aol.com>, "SteveJulieBlake (noelblake@comcast.net)" <noelblake@comcast.net>, "Tara and Ujahn Davisson (tdavisson@gmail.com)" <tdavisson@gmail.com>, "Thomas Holder (thom.holder@comcast.net)" <thom.holder@comcast.net>, "Tom & Gwen Sieben (gwensieben@att.net)" <gwensieben@att.net>, "Val Sabo (valariesabo5@hotmail.com)" <valariesabo5@hotmail.com>, "Vicky Smith (patvicsmith@q.com)" <patvicsmith@q.com>, "Viktoriya Yatsula (viktoriyac@gmail.com)" <viktoriyac@gmail.com>, "William J. More (williamjmore@lynnpropertiesllc.com)" <williamjmore@lynnpropertiesllc.com>, "Yvonne Davis (yvonne.davis@tqs.com)" <yvonne.davis@tqs.com>
Date: Friday, October 19, 2012, 12:45 PM

I have no problem with our first responders training on Mapleton.

Personally, I am glad that our law enforcement officers (and the fire fighters about a month ago) are able to train in abandoned houses to keep up their skills in a relatively safe environment. Having them in our neighborhood can only help with their knowledge of where we are and what the community is like so if there ever IS an emergency, they know their way around.

Mark Mutschler

On Fri, Oct 19, 2012 at 9:08 AM, Walters, Rebecca (DS) <Rebecca.Walters@adp.com> wrote:
Zach:

Would you please submit this email and letter to the Planning Commission for the Lake Oswego/Tigard Water Treatment Plant and Pipeline conditional use permits application?

This letter arrived yesterday at my home which is located on Mapleton Drive. This letter is indicative that the WTF/pipeline is a REGIONAL water supply and this letter is SCARY.

Here are a few excerpts but the entire letter is attached for your perusal.

"I am writing this to inform you that the Clackamas County Sheriff's Office Special Weapons and Tactics (SWAT) team plans to train in or near your neighborhood sometime in the next two weeks. .... You can expect to see many patrol cars from various law enforcement agencies within Clackamas County, deputies and police officers wearing heavy vests and helmets as well as several armored vehicles. ... You may hear small reports (pops) from training munitions throughout the day."

Thanks,
Rebecca Walters

Pelz, Zach

From: shanonmv@comcast.net
Sent: Friday, October 19, 2012 1:46 PM
To: gwen sieben
Cc: Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Ray and Kim Cozby (rcozby@hotmail.com); Rich Sheu (rickveda22@yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229@msn.com); Shane Medberry (shanemedbery@me.com); Sharon Knutson (norahs1344@yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacey Gianopoulis (butterqueen@comcast.net); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com); Rebecca (DS) Walters; Mark & Fariba Mutschler
Subject: Re: sheriff SWAT team

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Shanon

From: "gwen sieben" <gwensieben@att.net>
To: "Rebecca (DS)Walters" <Rebecca.Walters@adp.com>, "Mark & Fariba Mutschler" <drs.mutschler@gmail.com>
Cc: "Zach (ZPELZ@westlinnoregon.gov)Pelz" <ZPELZ@westlinnoregon.gov>, "Julie McAdams (juliecmcadams@yahoo.com)" <juliecmcadams@yahoo.com>, "Amanda Davidson (javahag@comcast.net)" <javahag@comcast.net>, "Benjamin Brink (kappa@dekka.com)" <kappa@dekka.com>, "Bob and Muriel Rowning (murbobr@q.com)" <murbobr@q.com>, "Brian and Anna Wheeler (annaw@hevanet.com)" <annaw@hevanet.com>, "Brian Niedermeyer (bniedermeyer@msn.com)" <bniedermeyer@msn.com>, "BrianonMapleton(quetzal.verapaz@gmail.com)" <quetzal.verapaz@gmail.com>, "Casey Davidson (cdavidson@hfflp.com)" <cdavidson@hfflp.com>, "Chuck Landskronercrm (chucklandskronercrm@hotmail.com)" <chucklandskronercrm@hotmail.com>, "Cindy Kauffman (cinkauffman@yahoo.com)" <cinkauffman@yahoo.com>, "Darryl Walters (darryl_walters@comcast.net)" <darryl_walters@comcast.net>, "Dave Froode (dfroode@comcast.net)" <dfroode@comcast.net>, "Eric Jones (ericjones2009@aol.com)" <ericjones2009@aol.com>, "Francisco and Traci Varela (francisco.varela@comcast.net)" <francisco.varela@comcast.net>, "Gary and Judy Emblen(2emblens@comcast.net)" <2emblens@comcast.net>, "Georgia Gavin (glgavin@comcast.net)" <glgavin@comcast.net>, "Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com)" <glendawaddle@greatnorthwestpropertiesmanagement.com>, "Jan and Scott Gerber (jumpin@cmn.net)" <jumpin@cmn.net>, "Jana and Neal Rea (flyartcreations@comcast.net)" <flyartcreations@comcast.net>, "Janet BecketSamStephens (thorfinn@comcast.net)" <thorfinn@comcast.net>, "Jeff Morrison (jeffmorrison@lynninvestments.com)" <jeffmorrison@lynninvestments.com>, "Jenne Henderson (hendersonjj@comcast.net)" <hendersonjj@comcast.net>, "Jerry Henderson (jhenderson@smacna-columbia.org)" <jhenderson@smacna-columbia.org>, justjoanmail@yahoo.com, "Ken Hanawa (kenhanawa@yahoo.com)" <kenhanawa@yahoo.com>, "Kevin Bryck (kevinbryck@comcast.net)" <kevinbryck@comcast.net>, lamontking@comcast.net, "Lin and Cindy Stott (c.stott@comcast.net)" <c.stott@comcast.net>, "Linda Edwards (lindaedwards@clear.net)" <lindaedwards@clear.net>, "Liselotte Sheu (liselotte@dekka.com)" <liselotte@dekka.com>, "Mark Ellsworth (mark.ellsworth@comcast.net)" <mark.ellsworth@comcast.net>, "Mary and Dave Robinson (drcanes14@gmail.com)" <drcanes14@gmail.com>, "Marylee King (maryleek@gmail.com)" <maryleek@gmail.com>, "Mia and Derek Tippner (miatippner@gmail.com)" <miatippner@gmail.com>, "Michael Ragan (mike@workflowpro.net)" <mike@workflowpro.net>, "Mike Cooper (hawkey88@comcast.net)" <hawkey88@comcast.net>, "Mike Patel (munixinc2000@yahoo.com)" <munixinc2000@yahoo.com>, "Natalie Cooper (n.nahey.4.coopers@comcast.net)" <n.nahey.4.coopers@comcast.net>, "Nathalie Christensen (tessamess@gmail.com)" <tessamess@gmail.com>, "Norm King (normbking@gmail.com)" <normbking@gmail.com>, "Pete Bedard (stoplotnow@gmail.com)" <stoplotnow@gmail.com>, "Rachel Yeoh-Hanawa (ryhimm@hotmail.com)" <ryhimm@hotmail.com>, "Ray and Kim Cozby (rcozby@hotmail.com)" <rcozby@hotmail.com>, "Rich Sheu (rickveda22@yahoo.com)" <rickveda22@yahoo.com>, "Sam Stephens (sistephe@gapac.com)" <sistephe@gapac.com>, "Scott Ann Reid (sreid_229@msn.com)" <sreid_229@msn.com>, "Shane Medberry

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Subject: Re: FW: sheriff SWAT team
To: "Walters, Rebecca (DS)" <Rebecca.Walters@adp.com>
Cc: "Pelz, Zach (ZPELZ@westlinnoregon.gov)" <ZPELZ@westlinnoregon.gov>, "Julie McAdams (juliecmcadams@yahoo.com)" <juliecmcadams@yahoo.com>, "Amanda Davidson (javahag@comcast.net)" <javahag@comcast.net>, "Benjamin Brink (kappa@dekka.com)" <kappa@dekka.com>, "Bob and Muriel Rowning (murbobr@q.com)" <murbobr@q.com>, "Brian and Anna Wheeler (annaw@hevanet.com)" <annaw@hevanet.com>, "Brian Niedermeyer (bniedermeyer@msn.com)" <bniedermeyer@msn.com>, "BrianonMapleton(quetzal.verapaz@gmail.com)" <quetzal.verapaz@gmail.com>, "Casey Davidson (cdavidson@hfflp.com)" <cdavidson@hfflp.com>, "Chuck Landskronercrm (chucklandskronercrm@hotmail.com)" <chucklandskronercrm@hotmail.com>, "Cindy Kauffman (cinkauffman@yahoo.com)" <cinkauffman@yahoo.com>, "Darryl Walters (darryl_walters@comcast.net)" <darryl_walters@comcast.net>, "Dave Froode (dfroode@comcast.net)" <dfroode@comcast.net>, "Eric Jones (ericjones2009@aol.com)" <ericjones2009@aol.com>, "Francisco and Traci Varela (francisco.varela@comcast.net)" <francisco.varela@comcast.net>, "Gary and Judy Emblen(2emblens@comcast.net)" <2emblens@comcast.net>, "Georgia Gavin (glgavin@comcast.net)" <glgavin@comcast.net>, "Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com)" <glendawaddle@greatnorthwestpropertiesmanagement.com>, "Jan and Scott Gerber (jumpin@cmn.net)" <jumpin@cmn.net>, "Jana and Neal Rea (flyartcreations@comcast.net)" <flyartcreations@comcast.net>, "Janet BecketSamStephens (thorfinn@comcast.net)" <thorfinn@comcast.net>, "Jeff Morrison (jeffmorrison@lynninvestments.com)" <jeffmorrison@lynninvestments.com>, "Jenne Henderson (hendersonjj@comcast.net)" <hendersonjj@comcast.net>, "Jerry Henderson (jhenderson@smacna-columbia.org)" <jhenderson@smacna-columbia.org>, "justjoanmail@yahoo.com" <justjoanmail@yahoo.com>, "Ken Hanawa (kenhanawa@yahoo.com)" <kenhanawa@yahoo.com>, "Kevin Bryck (kevinbryck@comcast.net)" <kevinbryck@comcast.net>, "lamontking@comcast.net" <lamontking@comcast.net>, "Lin and Cindy Stott (c.stott@comcast.net)" <c.stott@comcast.net>, "Linda

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Date: Friday, October 19, 2012, 12:45 PM

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Thanks,
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Pelz, Zach

From: gwen sieben [gwensieben@att.net]
Sent: Friday, October 19, 2012 1:06 PM
To: Rebecca (DS)Walters; Mark & Fariba Mutschler
Cc: Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Ray and Kim Cozby (rcozby@hotmail.com); Rich Sheu (rickveda22@yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229@msn.com); Shane Medberry (shanemedbery@me.com); Shanon Vroman (shanonmv@comcast.net); Sharon Knutson (norahs1344@yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacey Gianopoulis (butterqueen@comcast.net); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com)
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Rebecca

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To: Walters, Rebecca (DS)
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Pelz, Zach

From: Mark & Fariba Mutschler [drs.mutschler@gmail.com]
Sent: Friday, October 19, 2012 12:45 PM
To: Walters, Rebecca (DS)
Cc: Pelz, Zach; Julie McAdams (juliecmcadams@yahoo.com); Amanda Davidson (javahag@comcast.net); Benjamin Brink (kappa@dekka.com); Bob and Muriel Rowning (murbobr@q.com); Brian and Anna Wheeler (annaw@hevanet.com); Brian Niedermeyer (bniedermeyer@msn.com); BrianonMapleton(quetzal.verapaz@gmail.com); Casey Davidson (cdavidson@hfflp.com); Chuck Landskronercrm (chucklandskronercrm@hotmail.com); Cindy Kauffman (cinkauffman@yahoo.com); Darryl Walters (darryl_walters@comcast.net); Dave Froode (dfroode@comcast.net); Eric Jones (ericjones2009@aol.com); Francisco and Traci Varela (francisco.varela@comcast.net); Gary and Judy Emblen(2emblens@comcast.net); Georgia Gavin (glgavin@comcast.net); Glenda Waddle (glendawaddle@greatnorthwestpropertiesmanagement.com); Jan and Scott Gerber (jumpin@cmn.net); Jana and Neal Rea (flyartcreations@comcast.net); Janet BecketSamStephens (thorfinn@comcast.net); Jeff Morrison (jeffmorrison@lynninvestments.com); Jenne Henderson (hendersonjj@comcast.net); Jerry Henderson (jhenderson@smacna-columbia.org); justjoanmail@yahoo.com; Ken Hanawa (kenhanawa@yahoo.com); Kevin Bryck (kevinbryck@comcast.net); lamontking@comcast.net; Lin and Cindy Stott (c.stott@comcast.net); Linda Edwards (lindaedwards@clear.net); Liselotte Sheu (liselotte@dekka.com); Mark Ellsworth (mark.ellsworth@comcast.net); Mary and Dave Robinson (drcanes14@gmail.com); Marylee King (maryleek@gmail.com); Mia and Derek Tippner (miatippner@gmail.com); Michael Ragan (mike@workflowpro.net); Mike Cooper (hawkey88@comcast.net); Mike Patel (munixinc2000@yahoo.com); Natalie Cooper (n.nahey.4.coopers@comcast.net); Nathalie Christensen (tessamess@gmail.com); Norm King (normbking@gmail.com); Pete Bedard (stoplotnow@gmail.com); Rachel Yeoh-Hanawa (ryhimm@hotmail.com); Ray and Kim Cozby (rcozby@hotmail.com); Rich Sheu (rickveda22@yahoo.com); Sam Stephens (sistephe@gapac.com); Scott Ann Reid (sreid_229@msn.com); Shane Medberry (shanemedbery@me.com); Shanon Vroman (shanonmv@comcast.net); Sharon Knutson (norahs1344@yahoo.com); Shaun Gavin (spgavin63@gmail.com); Stacey Gianopoulis (butterqueen@comcast.net); Stacy Epsteen (sepsteen@comcast.net); Steve Hopkins (SFHopkins9@aol.com); SteveJulieBlake (noelblake@comcast.net); Tara and Ujahn Davisson (tdavisson@gmail.com); Thomas Holder (thom.holder@comcast.net); Tom & Gwen Sieben (gwensieben@att.net); Val Sabo (valariesabo5@hotmail.com); Vicky Smith (patvicsmith@q.com); Viktoriya Yatsula (viktoriyac@gmail.com); William J. More (williamjmore@lynnpropertiesllc.com); Yvonne Davis (yvonne.davis@tqs.com)
Subject: Re: FW: sheriff SWAT team

Follow Up Flag: Follow up
Flag Status: Flagged

I have no problem with our first responders training on Mapleton.

Personally, I am glad that our law enforcement officers (and the fire fighters about a month ago) are able to train in abandoned houses to keep up their skills in a relatively safe environment. Having them in our neighborhood can only help with their knowledge of where we are and what the community is like so if there ever IS an emergency, they know their way around.

Mark Mutschler

On Fri, Oct 19, 2012 at 9:08 AM, Walters, Rebecca (DS) <Rebecca.Walters@adp.com> wrote:

Zach:

Would you please submit this email and letter to the Planning Commission for the Lake Oswego/Tigard Water Treatment Plant and Pipeline conditional use permits application?

This letter arrived yesterday at my home which is located on Mapleton Drive. This letter is indicative that the WTF/pipeline is a REGIONAL water supply and this letter is SCARY.

Here are a few excerpts but the entire letter is attached for your perusal.

"I am writing this to inform you that the Clackamas County Sheriff's Office Special Weapons and Tactics (SWAT) team plans to train in or near your neighborhood sometime in the next two weeks. .... You can expect to see many patrol cars from various law enforcement agencies within Clackamas County, deputies and police officers wearing heavy vests and helmets as well as several armored vehicles. ... You may hear small reports (pops) from training munitions throughout the day."

Thanks,

Rebecca Walters

Pelz, Zach

From: Rachel Yeoh-Hanawa [ryhimm@hotmail.com]
Sent: Friday, October 19, 2012 12:32 PM
To: dfroode@comcast.net; rebecca.walters@adp.com
Cc: Pelz, Zach; juliecmcadams@yahoo.com; javahag@comcast.net; kappa@dekka.com; murbobr@q.com; annaw@hevanet.com; bniedermeyer@msn.com; quetzal.verapaz@gmail.com; cdavidson@hfflp.com; chucklandskronercrm@hotmail.com; cinkauffman@yahoo.com; darryl_walters@comcast.net; ericjones2009@aol.com; francisco.varela@comcast.net; 2emblens@comcast.net; glgavin@comcast.net; glendawaddle@greatnorthwestpropertiesmanagement.com; jumpin@cmn.net; flyartcreations@comcast.net; thorfinn@comcast.net; jeffmorrison@lynninvestments.com; hendersonjj@comcast.net; jhenderson@smacna-columbia.org; justjoanmail@yahoo.com; kenhanawa@yahoo.com; kevinbryck@comcast.net; lamontking@comcast.net; c.stott@comcast.net; lindaedwards@clear.net; liselotte@dekka.com; mark.ellsworth@comcast.net; drs.mutschler@gmail.com; drcanes14@gmail.com; maryleek@gmail.com; miatippner@gmail.com; mike@workflowpro.net; hawkey88 @comcast.net; munixinc2000@yahoo.com; n.nahey.4.coopers@comcast.net; tessamess@gmail.com; normbking@gmail.com; stoplotnow@gmail.com; rcozby@hotmail.com; rickveda22@yahoo.com; sistephe@gapac.com; sreid_229@msn.com; shanemedbery@me.com; shanonmv@comcast.net; norahs1344@yahoo.com; spgavin63 @gmail.com; butterqueen@comcast.net; sepsteen@comcast.net; sfhopkins9@aol.com; noelblake@comcast.net; tdavisson@gmail.com; thom.holder@comcast.net; gwensieben@att.net; valariesabo5@hotmail.com; patvicsmith@q.com; viktoriyac@gmail.com; williamjmore@lynnpropertiesllc.com; yvonne.davis@tqs.com
Subject: RE: sheriff SWAT team
Attachments: ijcaffef.png; bajcjhfa.png

Thanks, Dave for the update and pictures. I'm surprised that the Clackamas County Sheriff's Swat Team would jump in blindly to their "training surroundings." Questionable how their captain would miss the WTF, when locating their target! Sounds pretty efficient to me......

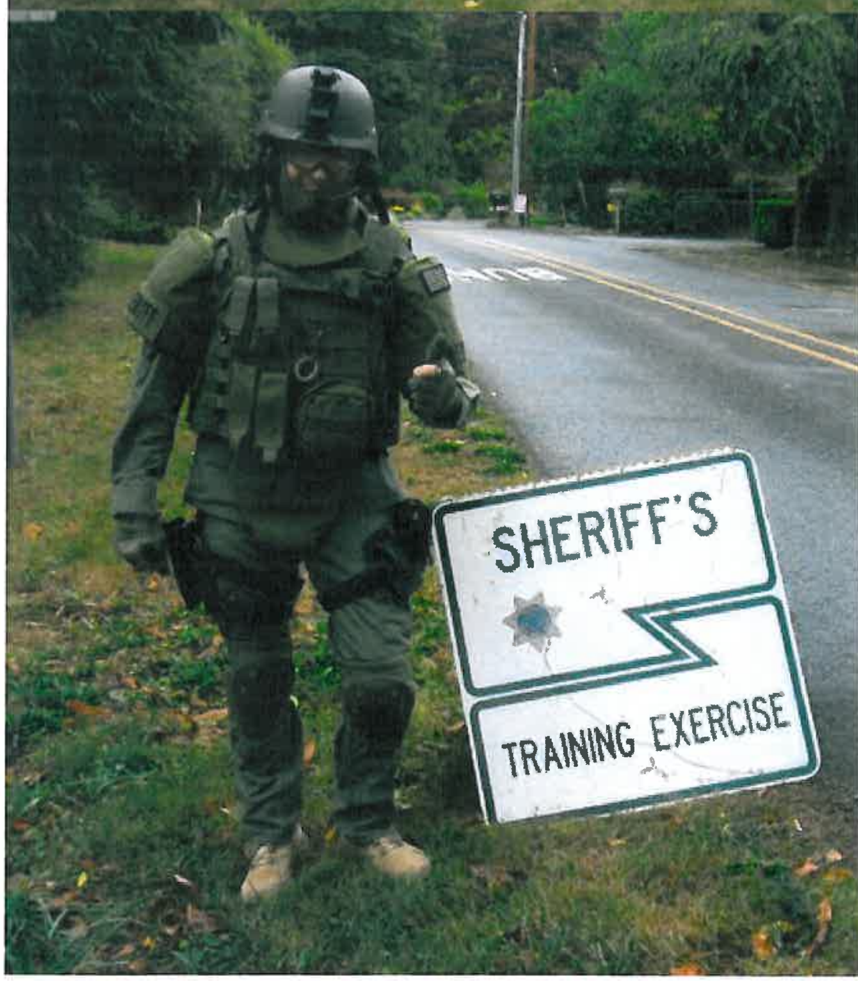
Have a good day,
Rachel Hanawa

Date: Fri, 19 Oct 2012 11:13:09 -0700
From: dfroode@comcast.net
To: Rebecca.Walters@adp.com
CC: ZPELZ@westlinnoregon.gov; juliecmcadams@yahoo.com; javahag@comcast.net; kappa@dekka.com; murbobr@q.com; annaw@hevanet.com; bniedermeyer@msn.com; quetzal.verapaz@gmail.com; cdavidson@hfflp.com; chucklandskronercrm@hotmail.com; cinkauffman@yahoo.com; darryl_walters@comcast.net; ericjones2009@aol.com; francisco.varela@comcast.net; 2emblens@comcast.net; glgavin@comcast.net; glendawaddle@greatnorthwestpropertiesmanagement.com; jumpin@cmn.net; flyartcreations@comcast.net; thorfinn@comcast.net; jeffmorrison@lynninvestments.com; hendersonjj@comcast.net; jhenderson@smacna-columbia.org; justjoanmail@yahoo.com; kenhanawa@yahoo.com; kevinbryck@comcast.net; lamontking@comcast.net; c.stott@comcast.net; lindaedwards@clear.net; liselotte@dekka.com; mark.ellsworth@comcast.net; Drs.mutschler@gmail.com; drcanes14@gmail.com; maryleek@gmail.com; miatippner@gmail.com; mike@workflowpro.net; hawkey88@comcast.net; munixinc2000@yahoo.com; n.nahey.4.coopers@comcast.net; tessamess@gmail.com; normbking@gmail.com; stoplotnow@gmail.com; ryhimm@hotmail.com; rcozby@hotmail.com; rickveda22@yahoo.com; sistephe@gapac.com; sreid_229@msn.com; shanemedbery@me.com; shanonmv@comcast.net; norahs1344@yahoo.com; spgavin63@gmail.com; butterqueen@comcast.net; sepsteen@comcast.net; SFHopkins9@aol.com; noelblake@comcast.net; tdavisson@gmail.com; thom.holder@comcast.net; gwensieben@att.net; valariesabo5@hotmail.com; patvicsmith@q.com; viktoriyac@gmail.com; williamjmore@lynnpropertiesllc.com; yvonne.davis@tqs.com
Subject: Re: FW: sheriff SWAT team

This is a Clackamas County Sheriff's Swat Team training exercise. It is being held on Mapleton across from McAdams home. The vehicles are parked on the vacant lots and they are using the LO homes. They said it has nothing to do with the WTF being a terrorist target.

I spoke with Captain Kevin Layng of the Clackamas County Sheriff's Dept.503-785-5007 They look for land and buildings that are about to be torn down and use them for their training because nobody cares if they are damaged during the training. The Captain said they have nothing to do with the LOT WTF and did not know it was even there until they were on premise.

Dave



On 10/19/2012 9:08 AM, Walters, Rebecca (DS) wrote:

Zach:

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Thanks,
Rebecca Walters
