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West Linn Pipelines Land Use Application

Submittal Section 10

Construction Management Plan for Raw Water and Finished Water Pipelines in West Linn

CONTENTS

1. Introduction

The Lake Oswego – Tigard Water Partnership (Partnership) includes two major pipeline systems. The Raw Water Pipeline (RWP) will convey raw water from the River Intake Pump Station (RIPS) located in Gladstone to the Water Treatment Plant (WTP) located in West Linn. The Finished Water Pipeline (FWP) will convey treated drinking water from the WTP to reservoirs and pumping stations in Lake Oswego and Tigard.

This Construction Management Plan (CMP) discusses the construction activities, potential construction impacts, and construction impact mitigation that will be employed to install the RWP and FWP within West Linn city limits, per the requirements of the West Linn Community Development Code. This document does not address any construction activities or impacts associated with the upgrade of the WTP. A separate CMP for the WTP will be submitted as part of the WTP land use application update. In addition, the Partnership will submit a consolidated CMP at a later date which will discuss the construction activities for both pipelines and the WTP projects.

2. Construction Overview

There are three distinct construction phases for the RWP and FWP projects within the City of West Linn. The construction methodologies for each phase include open-cut construction on Mapleton Drive for the RWP and FWP, open-cut construction on Highway 43 for the FWP, and horizontal directional drilling (HDD) construction for the RWP within property owned by the Oregon Parks and Recreation Department (OPRD). Figure 1 shows the construction alignment and phases. Each of these is described in more detail below.

2.1 Construction Phases

The construction phases are described in the sections below.

2.1.1 HDD Construction

The Partnership proposes to use HDD methods to construct the RWP underneath the Willamette River. The crossing will consist of a 42-inch-diameter pipe that is 3,800 feet long. The HDD crossing will begin (entry) at property owned by the OPRD at the southeast end of Mapleton Drive (adjacent to the City of West Linn's Mapleton Pump Station and north of Mary S. Young State Park) and will end (exit) at Meldrum Bar Park in Gladstone. Approximately 950 linear feet of this crossing alignment will be in West Linn. Figure 2 shows the location and layout of the HDD operation within the two OPRD properties and the HDD alignment through these properties and Mary S. Young State Park. The HDD alignment will be tunneled approximately 30 to 60 feet below the bed of the Willamette River and Mary S. Young State Park between entry and exit locations. Open cut excavation of the river crossing was considered and was not selected due to adverse impacts to the park and recreational fishing activities within the Willamette River. The HDD construction process will not result in any impacts along the alignment other than the entry and exit point. HDD is the construction technique preferred by the state and federal agencies with jurisdiction in the river.

Many of the HDD drilling activities will occur at the HDD entry location on the west side of the river in the OPRD parcels. HDD drilling activities will occur within approved construction work hours, which are 7 a.m. to 7 p.m. Monday through Friday and 9 a.m. to 5 p.m. Saturday. HDD construction methods are described in Section 3.1.1.

2.1.2 Mapleton Drive Open-Cut Construction

The RWP includes the construction of approximately 1, 500 linear feet of 42-inch-diameter open-cut pipeline on Mapleton Drive (see Figure 1). This segment of the RWP will begin at the southeast end of Mapleton

Drive and will end at the WTP site on Mapleton Drive. The FWP includes the construction of approximately 1,850 linear feet of 48-inch-diameter open-cut pipeline on Mapleton Drive. This segment of the FWP will begin at the WTP site on Mapleton Drive and will end at the intersection of Mapleton Drive and Highway 43. Construction activities for these portions of the RWP and FWP will be combined into one construction contract on Mapleton Drive. Combining construction activities for the RWP and FWP on Mapleton Drive will increase overall construction efficiency and streamline the construction management process, since a single contractor will be responsible for all construction work on Mapleton Drive. Construction for this portion of the pipelines will occur during work hours defined by the City of West Linn (7 a.m. to 7 p.m. Monday through Friday, 9 a.m. to 5 p.m. Saturday). Open-cut construction methods are described in Section 3.2.1. The presence of large storm drain culverts perpendicular to the roadway along the pipeline alignment may require short lengths of pipe installation via trenchless construction methods. Trenchless construction activities will be constrained by the requirements included in this CMP.

In addition to the RWP and FWP work that will occur on Mapleton Drive, approximately 2,850 linear feet of 6-inch-diameter asbestos cement water line will be replaced between Highway 43 and the intersection of Nixon Ave and Mapleton Drive. The water line is owned by the City of West Linn, but will be replaced by with a new 8-inch ductile iron pipe built to current engineering standards. The cost of this water line replacement will be shared between the Partnership and the City of West Linn. Additional utility upgrade opportunities along the alignment may be identified at a later point and will be coordinated between the City of West Linn Engineering Department and the Partnership. Construction for these improvements will occur within the construction process described herein.

2.1.3 Highway 43 Open-Cut Construction

The FWP includes the construction of approximately 5,200 linear feet of 48-inch-diameter open-cut pipeline on Highway 43 within West Linn (see Figure 1). This segment of the FWP will begin at the intersection of Mapleton Drive and Highway 43 and will continue on Highway 43 to the West Linn city limits immediately north of Arbor Drive. The Oregon Department of Transportation (ODOT) has directed that that work hours for all construction activities on Highway 43 occur during the nighttime hours of 8 p.m. to 5 a.m. Details are provided in Appendix A. Nighttime construction work along this segment of the pipeline will decrease traffic-related impacts and keep the construction duration to a minimum. Open-cut construction methods are described in Section 3.3.1. The presence of large storm drain culverts perpendicular to the roadway along the pipeline alignment may require short lengths of pipe installation via trenchless construction methods. Trenchless construction activities will be constrained by the requirements included in this CMP. Additional utility upgrade opportunities along the alignment will possibly be identified at a later point and will be coordinated between the City of West Linn Engineering Department and the Partnership. Construction for additional utility improvements not specifically discussed will occur in accordance with the construction process described herein.

2.2 Post-Construction Project Impacts

The pipelines will be buried approximately 4 feet under paved right-of-way for open-cut construction methods or 7.5- to 60 feet below ground surface (bgs) for HDD construction methods. Therefore, the RWP and FWP will not be visible to the public following construction. The only visible part of the project will be the intermittent manhole lids (similar to those required for sanitary or storm utilities) located over pipeline appurtenances in approximately 12 places along the alignment. The manholes will be either 24 or 36 inches in diameter and will conform to City of West Linn standards.

2.3 Project Phasing

Construction of the RWP and FWP projects within West Linn is anticipated to occur between March 2014 and August 2015. Table 1 lists possible construction window for each phase. The estimate construction duration for each phase will be shorter than the possible construction window and is also included in Table 1.

Table 1. Project Phasing by Pipeline Segment

Phase	Anticipated start of construction window	Anticipated end of construction window	Estimated construction duration
HDD construction (access from Mapleton Drive)	March 2014	October 2014	6 Months
Open-cut construction on Mapleton Drive	November 2014	March 2015	3 Months
Open-cut construction on Highway 43 (West Linn portion)	June 2014	August 2015	5 Months

2.4 Pipeline Easements

The Partnership will obtain permanent pipeline easements from OPRD through Mary S. Young Park and the two OPRD parcels as noted in Table 2. The Partnership will also obtain temporary construction easements from the OPRD to allow sufficient construction work area for staging and operations during the HDD construction phase.

No permanent or temporary construction easements are required for the FWP pipeline alignment in the Mapleton or Highway 43 rights-of-way.

Table 2. Easement Summary Table in West Linn

Tax map/lot number	Type of easement	Description
21E24/00600	Subsurface permanent	25' wide permanent subsurface pipeline easement through Mary S Young Park and 25' wide permanent surface easement and temporary construction easement in OPRD parcels.
21E24AC/00100	Permanent and temporary	
21E24AC/00200	Permanent and temporary	

3. Construction Methodology

This section describes the different construction methods for each pipeline segment.

3.1 HDD Construction Method

The HDD phase of construction is described in detail below.

3.1.1 HDD Overview

HDD is a three-phase process: 1) pilot bore drilling; 2) borehole reaming to reach the design borehole diameter; and 3) pipe pullback in which the pipe is pulled into the reamed borehole. The process begins with the preparation and mobilization at the HDD entry site. Mobilization activities will include minor tree removal, installation of tree protection fencing, installation of temporary construction sound mitigation wall, implementation of erosion control measures, setup and positioning of the HDD construction equipment, and installation of the HDD conductor casing. These activities are estimated to take approximately 2 weeks.

Specific construction impacts to traffic and access and proposed mitigation measures in regard to setup and mobilization are discussed in Section 4.2.

Drilling will begin once mobilization is complete at the OPRD site. During the first 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 bore diameter to a size suitable to accept the designed pipeline. Drilling mud will be circulated and pumped into the bore hole throughout the pilot bore and reaming processes to keep the bore hole open and to remove excavated material. Drilling mud (also referred to as drilling fluid) primarily consists of bentonite, an environmentally safe and naturally occurring clay material, and water. Water used to create and maintain drilling mud will be obtained by tapping into the existing City of West Linn water main in Mapleton Drive as approved by the City of West Linn or by tapping into the existing City of Lake Oswego RWP also in Mapleton Drive. Drilling mud will be separated from excavated material onsite, and excavated material will be trucked from the OPRD site to a disposal site via haul routes defined in Section 4.2.1. Erosion control best management practices (BMPs) will be employed to ensure that drilling mud is handled properly throughout the construction process and that spills, in the unlikely event that one should occur, are cleaned up properly and immediately.

Once the bore hole operation is complete, the contractor will pull the product pipe into the bore hole from Gladstone to West Linn via a process called pipe pullback. The pipe will be assembled in two 1,900-foot segments in Gladstone and pulled into the bore hole over a single 24- to 48-hour period. The pipe will be assembled offsite and floated to the Meldrum Bar Park HDD site. Once the pipe is floating on the river and in position, it will be lofted via cranes and barges so that the leading section is in line with the exit angle of the bore. The pipe will then be pulled through the prepared bore all the way back to the entry point on the OPRD site. During this 24- to 48-hour period, construction activities must occur around-the-clock to minimize the risk of the pipe becoming stuck within the bore hole. The contractor will apply for a work hour variance from the West Linn City Manager, consistent with West Linn code. The contractor will also provide pullback construction information to local residents at least 2 weeks prior to commencing the pullback operation.

Once pullback is complete, the pipe will be grouted in place. Then the entry and exit sites will be cleaned and restored and the associated equipment will be disassembled and removed. These demobilization activities are anticipated to take approximately 1 week, and will mark the end of the HDD process.

3.1.2 HDD Staging

The HDD entry staging area for the drilling operation will be located on OPRD-owned property. Drilling equipment will be located and operated within a permanent pipeline easement and temporary construction easement from the OPRD. HDD pilot bore and reaming operations will be supported from this staging area. The pipeline will be pulled into the bore hole from the east side of the river via equipment located at the HDD entry staging area. Vacuum trucks and dump trucks carrying spoils will require routine access to the site throughout all drilling phases. The entry location and work area will be isolated from the rest of Mary S. Young Park, OPRD property, and public right-of-way with security fencing. With the exception of the fenced work area, HDD operations will not impact recreation within Mary S. Young Park and OPRD property, and signage will be provided to inform pedestrians about how to navigate safely around the HDD construction activity and staging areas. Existing pathways and trails into Mary S. Young Park will remain open throughout all phases of HDD construction. Figure 2 shows the construction equipment staging layout plan within the permanent and temporary construction easement in the park.

3.1.3 HDD Hydrofracture Mitigation

Hydrofracture is a risk associated with drilling in soil and occurs when drilling fluid pressure exceeds the strength and confining stress of the soil surrounding the bore hole. The excess pressure fractures the soil around the bore hole, allowing drilling fluid (water and bentonite) to escape. Hydrofracture is not a risk while

drilling in rock due to the high strength of the surrounding material as compared to the relatively low fluid pressure produced by the drilling mud. The risk of hydrofracture is limited to the first several hundred feet of the HDD alignment, from the entry location in the OPRD property where the depth of the bore hole in relation to the ground surface could result in drilling fluid pressure exceeding the soil pressure. The remaining distance of the HDD alignment in West Linn will be drilled through high-strength rock at a significant depth bgs resulting in a very low risk of hydrofracture.

The construction contractor will be required to employ mitigation measures to ensure that hydrofracture does not occur. The contractor will be required to install a conductor casing, an oversized pipe through which the bore hole is drilled, along at least the first 200 feet of the alignment from the entry point (to a depth of at least 35 feet bgs). The casing will contain any potential hydrofracture event completely in the location where it is installed thereby eliminating the largest risk for hydrofracture. To reduce the risk of hydrofracture further during construction, the contractor will use a down-hole pressure tracking system. The purpose of this system is to monitor fluid pressures in the bore hole just behind the drill bit, providing the drill operator with valuable real-time information to prevent over-pressurization of the bore. The contractor will calculate the drilling fluid pressures necessary to create the bore hole as well as the pressures that will result in hydrofracture. During construction, if the drilling pressures spike or increase above the limiting pressure, the driller will be required to shut off the pump immediately—effectively preventing the uncontrolled release of drilling mud. This system has been used successfully on other HDD projects to prevent drilling fluid release into rivers and sensitive wetlands.

By implementing these mitigation measures, the contractor will reduce the risk of hydrofracture substantially. Even though the risk of hydrofracture is very low and redundant safety protocols will be employed, if hydrofracture occurs on the OPRD site or in Mary S. Young State Park, the event will not create significant environmental damage. Drilling mud consists of non-toxic and naturally occurring materials. Therefore, erosion control BMPs, as described in the Erosion Control Memorandum prepared by Kennedy/Jenks Consultants and included in Section 13 of this land use application will be used to contain and clean up materials associated with a hydrofracture event.

3.1.4 HDD Construction Duration

RWP HDD construction is anticipated to occur between March 2014 and October 2014; construction activities on the OPRD property are expected to last for approximately 6 months. Construction activity will include mobilization, HDD drilling operations, site restoration, and demobilization. The site mobilization phase is estimated to occur over the first 2 weeks of this period. The pilot boring and reaming phases are estimated to occur for up to 6 months after mobilization. The pullback phase will last 24 to 48-hours and will occur immediately after the pilot boring and reaming phase. Demobilization of the HDD equipment is estimated to require approximately 1 week. Site restoration, including replanting and landscaping, will require approximately 1 month for completion. Monitoring and maintenance of restored areas and plantings will occur over an extended period of time per City of West Linn requirements.

3.2 Mapleton Drive Open-Cut Construction Method

This section describes steps for open-cut construction on Mapleton Drive.

3.2.1 Open-Cut Construction Method

The basic steps that will be used for open-cut pipe installation on Mapleton Drive on a daily basis are as follows:

1. Install temporary traffic control and access measures and delineate the work area for the day (length of delineated work area not to exceed 150 feet on any given day).

2. Bring all needed construction equipment and materials to the work area.
3. Saw cut pavement to the correct width, approximately 5 to 7 feet.
4. Excavate the trench with a track-mounted excavator.
5. Place excavated material in dump trucks and haul to approved offsite disposal area.
6. Place first lift of pipe bedding material (crushed rock) using loader and compact.
7. Deliver and stage pipe along trench.
8. Install pipe, weld joints together, and conduct joint weld inspections and tests.
9. Backfill trench pipe zone area with crushed rock and compact the material in lifts with mechanical methods.
10. Place additional backfill up to the bottom of pavement section.
11. Place and compact aggregate road base and pave over the trench. Contractor will use a temporary pavement surface to allow traffic access as quickly as possible.
12. Remove construction equipment and materials from the work area.
13. Remove temporary traffic control and access measures and re-open street to non-construction (i.e., normal) uses.

The following basic steps will be performed as a separate activity from the daily steps listed above on an as-needed basis:

14. As longer sections of pipeline are completed (appropriate length to be determined through coordination with the City of West Linn Engineering Department), the contractor will grind down the temporary asphalt pavement patch and a portion of the existing adjacent pavement and overlay with permanent asphalt pavement.
15. Restore all surface features disturbed during the pipe installation process.

The presence of large storm drain culverts perpendicular to the roadway along the pipeline alignment may require short lengths of pipe installation via trenchless construction methods. Trenchless construction activities will be constrained by the requirements included herein.

3.2.2 Construction Duration

Open-cut pipe construction on Mapleton Drive is anticipated to occur between November 2014 and March 2015; construction activities on Mapleton Drive are expected to last for approximately 3 months. This duration includes mobilization, pipe installation, site restoration, and demobilization. Based on consultation with potential contractors, the pipeline installation rate is estimated at an average of 50 linear feet per day. The installation rate includes items 1 through 13 of the daily activities listed in Section 3.2.1. Item 3, saw cutting, may not always be conducted on a daily basis. This means that saw cutting may be conducted for longer lengths of roadway than the contractor would typically need on a daily basis; in these cases, the contractor will be required to abide by all access requirements herein. Final street restoration will be a separate construction activity that will follow several weeks after daily pipeline installation activities are finalized and includes items 14 through 15 in Section 3.2.1. Final paving will be weather-dependent and subject to City of West Linn standards for environmental conditions.

Replacement of the West Linn-owned asbestos cement water line will occur between November 2014 and March 2015. This work will be conducted by the same construction contractor and in coordination with the RWP and FWP open-cut work on Mapleton Drive.

3.3 Highway 43 Open-Cut Method

This section describes the details for open-cut construction on Highway 43.

3.3.1 Open-Cut Construction Method

The FWP on Highway 43 will be constructed using the open-cut method described in Section 3.2.1. ODOT has issued a directive that all construction activity on Highway 43 be limited to nighttime hours (Appendix A).

3.3.2 Construction Duration

FWP open-cut construction in West Linn and within Highway 43 is anticipated to occur between June 2014 and August 2015; construction activities on Highway 43 in West Linn are expected to last for approximately 5 months. Construction activities will include mobilization, pipe installation, site restoration, and demobilization. Based on coordination with potential contractors, the pipeline installation rate is estimated at an average of 50 linear feet per day. This pipeline installation rate includes items 1 through 13 of the daily activities listed in Section 3.2.1. Final street restoration will be a separate construction activity and will follow several weeks after all daily pipeline installation activities are finalized; it will include items 14 and 15 in Section 3.2.1.

4. Construction Management

Construction management for all construction methods and proposed construction mitigation is described in this section

4.1 Preconstruction Assessment

The condition of the existing streets, landscaping, fencing and other structures adjacent to the streets will be catalogued during the preconstruction survey with photographs and video. The Partnership will restore all streets consistent with City of West Linn and ODOT standards after the RWP and FWP are installed. Although damage to private property is not anticipated, damaged landscaping, fences, and/or structures on public or private property will be restored to existing or better condition. In the event that damage to private property occurs, the contractor will be required to coordinate with residents and businesses to ensure that final restoration is equal to or better than the pre-construction conditions and in accordance with the property owner's reasonable expectations.

4.2 Traffic Control and Access

DKS, Inc. prepared a traffic control and access memorandum which is included in Section 12 of this land use application. It provides background traffic information, access strategies, and traffic control strategies. This section summarizes key items in the traffic memorandum and quantifies traffic impacts resulting from pipeline construction. Key items include the following:

- Construction truck trip volume
- Construction haul routes
- Traffic control strategies

- Pedestrian and bicycle circulation plan
- Emergency vehicle access
- Residential and commercial driveway access
- Transit and school bus access

4.2.1 Construction Truck Trip Volume

HDD Construction. Dump truck and large truck trip volume is estimated based on the construction activities discussed in Section 3.1. Site mobilization activities will last for approximately 2 weeks and will result in approximately 12 average daily truck trips (ADTs), defined as one-way trips (i.e., 12 ADTs consist of 12 one-way trips in each direction or 6 round-trips), to deliver construction equipment and support mobilization activities. Most of the drilled material associated with HDD operations will be removed at the HDD entry location.

Up to 60 cubic yards (cy) of material is anticipated to be removed each day for the pilot bore and reaming phases of HDD construction. A standard dump truck has a volume of 10 cy; therefore, the 60 cy of material could be transported by 12 ADTs. The pilot bore and reaming phases of the project will last approximately 6 months.

During the pipe pullback phase of HDD construction, which will only occur over a continuous 24 to 48-hour period, approximately 144 ADTs may be required to handle excess drilling mud (up to six ADTs per hour over a 24-hour period). Truck trips required during the pipe pullback period will consist of Vactor trucks, which are vacuum trucks used to transport wet material such as drilling mud.

An average of 12 ADTs may be required for HDD demobilization.

Additionally, typical contractor activities such as lunch breaks and various other tasks could result in up to ten ADTs for pickup trucks and other small vehicles. Therefore, it is anticipated that 22 ADTs could be experienced on any working day during the HDD construction schedule, with the only exception being pipe pullback in which up to 144 ADTs could be experienced over a continuous 24- to 48-hour period. This daily truck trip traffic will result in two truck trips per hour, which could be experienced during a typical 12-hour work day (7 a.m. to 7 p.m.), and up to six truck trips per hour over a 24-hour period for the 24- to 48- hour pullback period.

The contractor will be required to transport and deliver pipe to the HDD exit area on the east side of the river in Gladstone. This means that pipe transport and delivery will be kept to a minimum within the City of West Linn for the HDD operation. There is no alternative to excess drilling mud hauling from the OPRD site during the 24- to 48- hour pullback period since the pipe insertion point will block access for drilling mud removal on the Gladstone side of the HDD crossing. Therefore, Vactor truck operations must occur from the OPRD site.

Mapleton Drive Open-Cut Construction. The contractor will haul approximately 150 cy of excavated material each day due to construction activities on Mapleton Drive. This will result in approximately 30 ADTs of 10-cy dump trucks. An additional 130 cy on average of imported crushed rock will need to be hauled to the work area each day for trench backfill material. This results in an additional 26 ADTs of 10-cy dump trucks. Additional trips to deliver construction materials and equipment are estimated at ten ADTs. Furthermore, typical contractor activities such as lunch breaks and various other activities could result in up to ten ADTs for pickup trucks and other small vehicles. Therefore, the cumulative truck trip impact during open-cut construction along the pipeline alignment on Mapleton Drive will be approximately 76 ADTs or six truck trips per hour during a typical 12-hour construction work period (7 a.m. to 7 p.m.).

Highway 43 Open-Cut Construction. The contractor will haul approximately 150 cy of excavated material each day due to construction activities on Highway 43. This will result in approximately 30 ADTs of 10-cy

dump trucks. An additional 130 cy on average of imported crushed rock will need to be hauled to the work area each day for trench backfill material. This results in an additional 26 ADTs of 10-cy dump trucks. Additional trips to deliver construction materials and equipment are estimated at ten (ADTs. Furthermore, typical contractor activities such as lunch breaks and various other tasks could result in up to ten ADTs for pickup trucks and other small vehicles. Therefore, the cumulative truck trip impact during open-cut construction along the pipeline alignment on Highway 43 will be approximately 76 ADTs or eight truck trips per hour during a typical 9-hour construction work period (8 p.m. to 5 a.m.).

Construction traffic for each pipeline construction phase discussed above is not cumulative due to the overall project schedule and phasing. To minimize truck trip volume, HDD construction on Mapleton Drive will not occur at the same time as open-cut work on Mapleton Drive. Even though the schedule for Mapleton Drive and Highway 43 work will overlap, truck trip volume will never overlap for the two open-cut phases due to ODOT nighttime work hour restrictions for Highway 43 construction work. Table 3 lists expected truck trip volume (trips per hour) for each project phase.

Table 3. RWP and FWP Truck Trip Volume by Phase[1]

Phase	Truck trips per Hour[2]	Typical work hours	Anticipated start of construction window	Anticipated end of construction window
HDD construction (via Mapleton Drive) – normal	2	7 a.m. to 7 p.m.	March 2014	October 2014
HDD construction (via Mapleton Drive) – pullback	6	NA[3]	NA[3]	NA[3]
Open-cut construction on Mapleton Drive	6	7 a.m. to 7 p.m.	November 2014	March 2015
Open-cut construction on Highway 43	8	8 p.m. to 5 a.m.	June 2014	August 2015

[1]Additional daily truck trips will result from WTP construction activities which are not included in this table.

[2]All truck trip volume reported is one-way (each round trip results in two (2) one-way trips).

[3]HDD pullback activities will occur once over a continuous 24- to 48-hour period.

4.2.2 Construction Haul Routes

The contractor will use two construction haul routes for all construction activities on Mapleton Drive and Highway 43. The goal in choosing two routes is to minimize truck trip impacts to residential neighborhoods within West Linn and to provide the safest and most efficient access to and from the construction area. Both haul routes described below can be used for all RWP and FWP construction phases. The construction team will work collaboratively with the West Linn Police Department to ensure that all construction truck traffic obeys the posted speed limit on haul routes to and from the construction site. The contractor will be required to provide radar speed signs or use other methods recommended by the West Linn Police Department to promote speed control for all construction traffic entering and exiting the construction areas and traffic on established haul routes.

Highway 43 (North) to Highway 43 (South). Traffic to the construction site will be routed from Interstate 205 (I-205)to Highway 43 northbound to the construction area on Highway 43 or Mapleton Drive. Construction traffic from the site will be routed from the construction area on Highway 43 or Mapleton Drive via Highway 43 southbound to I-205. This haul route is shown in Figure 3. To minimize the potential for construction traffic backups on Mapleton Drive, construction traffic will be prohibited from making left turns at the intersection of Mapleton Drive and Highway 43 (this intersection has no traffic signal). This restriction will apply to construction traffic entering Mapleton Drive from Highway 43 and traffic entering Highway 43 from Mapleton Drive. Southbound construction traffic from Mapleton Drive will be required to

use a temporary access road through the Lake Oswego WTP property to access Kenthorpe Way, Old River Road, and Cedar Oak Drive, where traffic will turn left onto Highway 43 at the traffic signal at Cedar Oak Drive, as shown in Figure 3.

Highway 43 (North) to Stafford Road (South). Traffic to the construction site will be routed from I-205 to Highway 43 northbound to the construction area on Highway 43 or Mapleton Drive. Construction traffic from the site will be routed from the construction area on Highway 43 or Mapleton Drive via Highway 43 northbound to McVey Avenue and then via Stafford Road to I-205. This haul route is shown in Figure 4.

4.2.3 Traffic Control Strategies

Full roadway closures will be needed for open-cut construction on Mapleton Drive between Highway 43 and Nixon Avenue during construction work hours. During this time, a detour route will be provided for through traffic as described in the Traffic Control Memorandum included in Section 12 of this land use application. Southeast of Nixon Avenue, a single-lane closure with flaggers will be required for open-cut and HDD construction activities during construction work hours due to a lack of feasible detour routes for this section of roadway. Full and single lane road closures on Mapleton Drive will be required only during construction working hours of Monday through Friday 7 a.m. to 7 p.m. and Saturday 9 a.m. to 5 p.m. Residential access during these work hours is addressed in Section 4.4.6.

All construction on Highway 43 must be conducted during nighttime work hours (8 p.m. to 5 a.m.) consistent with ODOT's directive. Nighttime work on Highway 43 will result in construction noise to residents within the vicinity of the work area and will require a variance from the City of West Linn. Construction noise is discussed in further detail in Section 4.4.3.

Nighttime work on Highway 43 provides the following advantages:

- Traffic volumes are lower during nighttime hours. Therefore, lane closures can be accommodated with less impact to traffic, including fewer delays.
- In general, access and egress activity to abutting properties will be lower during nighttime hours.
- Potential conflicts with pedestrians, bicycles, and transit are substantially reduced.
- A longer continuous working shift can be achieved during nighttime hours, resulting in reduced overall construction duration.

4.2.4 Pedestrian and Bicycle Circulation Plan

Pedestrians and bicycles will be accommodated at all times around all construction work areas including the HDD construction staging area at the end of Mapleton Drive, Mapleton Drive open-cut construction, and Highway 43 open-cut construction. Accommodations for persons with disabilities and visual impairments shall be in accordance with the Americans with Disabilities Act and Americans with Disabilities Act Accessibility Guidelines. Figure 5 shows the overall pedestrian and bicycle circulation and access plan for construction on Highway 43, Mapleton Drive, Kenthorpe Way, and Mary S. Young State Park. Since pedestrian and bicycle access will be maintained at all times, there will be no impacts to the present pedestrian and bicycle circulation in the area as a result of the project.

Pedestrian and bicycle access along Mapleton Drive and Highway 43 will be provided via a dedicated 5-foot-wide temporary pathway that will be separated from the construction work zone by traffic channelizing devices, such as drums, tubular markers, cones, or chain-link fence. Channelizing devices will be placed at a safe distance, no less than 5 feet, from working construction equipment and will be adequately marked for the safety of pedestrians and bicyclists.

4.2.5 Emergency Vehicle Access

The contractor will be required to provide 12-foot-wide minimum emergency access at all times to all residential and commercial property through the construction work zone. The contractor will be required to move construction equipment and materials immediately to create access through the work zone suitable for emergency vehicles that will enable emergency response to any driveway or property within or beyond the work zone.

Tualatin Valley Fire & Rescue's (TVF&R) *Fire & Life Safety Requirements for Fire Department Access and Water Supplies* requires that emergency response access be provided to within 150 feet of each building to enable use of typical firefighting equipment. As stated above, the contractor will be required to move all construction equipment and materials immediately to allow emergency access within the work area to private property frontages. The applicant and design team members met with TVF&R on June 7, 2012. TVF&R representatives confirmed that the proposed approach for accommodating emergency access is acceptable and will allow the agency to maintain emergency responsiveness throughout the project duration. Correspondence from TVF&R is provided in Appendix B. The contractor will be required to coordinate on a regular basis with TVF&R and the West Linn Police Department so that, in the case of an emergency, existing emergency response times to all areas affected by RWP and FWP construction activities will be maintained. TVF&R and West Linn Police Department representatives will be invited to all pipeline construction progress meetings to facilitate close coordination throughout the construction process. The contractor will be required to notify TVF&R and the West Linn Police Department via daily e-mails. Notifications will be sent from a contractor representative to the e-mail addresses for TVF&R Stations 57 (Mountain Road), 58 (Willamette), and 59 (Bolton) and the West Linn Police Department noting activities, location, and duration of all expected construction work for the day.

4.2.6 Residential and Commercial Driveway Access

Construction of the pipelines along Mapleton Drive and Highway 43 may result in short-term temporary access impacts to residential driveways. Along the pipeline alignment, there are 51 residential driveways along Mapleton Drive, 35 residential driveways along Kenthorpe Way (there will be no RWP and FWP construction on Kenthorpe Way, but truck trip traffic may use Kenthorpe Way for haul route purposes), and 20 residential driveways along Highway 43. The maximum length of the open-cut construction zone will be 150 feet on Mapleton Drive and 200 feet on Highway 43 and will move at approximately 50 feet per day. Due to the nature of the construction zone, there may be instances during construction work that a resident will not be able to access his or her driveway for up to 12 hours during a normal work shift (see Section 4.7 for a mitigation measure that would allow access to driveways when the work area is directly in front of a driveway).

If required, a residential driveway closure shall be limited to a maximum of one work shift (7 a.m. to 7 p.m. weekdays and 9 a.m. to 5 p.m. Saturdays on Mapleton Drive or 8 p.m. to 5 a.m. on Highway 43). The contractor will be required to provide designated parking areas for residents affected by a temporary driveway closure. The contractor will be required to provide a temporary, wheelchair-accessible pedestrian access between the closed driveway and the designated parking area during construction hours as conditions require. Outside of construction hours, full access to all residential driveways will be restored.

There are 24 commercial driveways along the pipeline alignment on Highway 43 in West Linn. A detailed inventory of commercial businesses, their hours of operation, and driveway locations can be found in the traffic memorandum included in Section 12 of this land use application. Businesses or shopping centers with multiple access driveways or an access driveway from a side street will not require additional coordination, because the construction zone will impact only one driveway at a time and side street access will be maintained at all times. Of the businesses that have only one access driveway on Highway 43, only two may be impacted by the pipeline construction as a result of the 8 p.m. to 5 a.m. construction hours required by ODOT. These two businesses are Burgerville and Philadelphia's Steaks and Hoagies, which close at 11 p.m.

and 9 p.m., respectively. The contractor will be required to maintain constant access to these two driveways during the period that construction work hours overlap with business hours (8 p.m. to 11 p.m. for Burgerville and 8 p.m. to 9 p.m. for Philadelphia's Steaks and Hoagies). Temporary pedestrian access will be provided to all businesses along Highway 43 between the hours of 8 p.m. to 5 a.m., as described Section 4.2.4. Outside of construction hours, full access to all commercial driveways will be restored.

4.2.7 Transit and School Bus Access

Transit service within the project limits is provided by TriMet. TriMet Route 35 is the only bus route impacted by the RWP and FWP construction within West Linn. Buses on this route travel north-south on Highway 43 between Portland and Oregon City. Impacts to TriMet Route 35 will be minor. Specific impacts to individual bus stops will be identified during the design phase and will be coordinated with TriMet. The contractor will be required to temporarily relocate bus stops in impacted areas as directed by TriMet. The construction team will notify TriMet at least 3 weeks prior to construction at each bus stop to coordinate closure and installation of a temporary bus stop. Additionally, transit impacts resulting from the FWP along Highway 43 will occur only at night between 8 p.m. and 5 a.m. due to work hour constraints dictated by ODOT.

Although there are several school bus routes along Highway 43, construction work on Highway 43 will occur only between the hours of 8 p.m. and 5 a.m. and the contractor will be required to restore the work zone within the roadway and surrounding area to normal conditions prior to re-opening roadways. Therefore, it is anticipated there will be no impacts to school bus routes on Highway 43. The following three schools with bus routes have a stop at the intersection of Highway 43 and Mapleton Drive: Cedar Oak Primary, Rosemont Ridge Middle, and West Linn High. The contractor will be required to maintain this bus stop at all times during hours of school bus operation. There are no bus routes along Mapleton Drive.

4.3 Construction Notification and Coordination

All public agencies, commercial property owners and tenants, and residents will be notified no less than 2 weeks in advance of construction activities occurring within the vicinity of any affected property or facility. Notification methods may include mail, e-mail, door hangers, phone calls, or a combination of these methods determined to best reach the most residents. The notice will provide details regarding the location, duration, and construction methods that will be used within the vicinity of the affected property or facility. A subsequent notification will be given 48 hours prior to the start of construction that will provide a more detailed schedule of construction activity. The project team will have a full-time representative available to answer questions related to the project and coordinate special considerations needed to ensure that construction activities are conducted efficiently and impacts are kept to a minimum. The representative's contact information will be provided during public meetings prior to construction activities and during the 2-week and 48-hour notification processes.

Regular neighborhood meetings with affected residents are proposed to occur on a monthly basis during construction (or more frequently if required) to ensure the project owner and contractor are aware of resident needs or concerns. Regular meetings between the Partnership and neighborhood residents will also be held throughout the land use application and pre-construction process. These meetings will be used to identify and coordinate additional construction mitigation measures to be used during construction. Weekly coordination meetings will be held with TVF&R so that emergency response times are not affected by construction activities. E-mail notifications will be sent from a contractor representative to the station e-mail address for TVF&R Stations and the West Linn Police Department as described in Section 4.2.5.. Additional coordination meetings will be held on an as-needed basis with the City of West Linn, ODOT, TriMet, OPRD, the West Linn-Wilsonville School District, and other agencies that may be affected by the pipeline project.

4.4 Construction Noise Impacts and Proposed Mitigation

Environ International Corporation (Environ) prepared a Noise Study Memorandum, which is included in Section 11 of this land use application. Noise impacts are discussed relative to the three construction phases: HDD construction, Mapleton Drive open-cut construction, and Highway 43 open-cut construction. There is no applicable construction noise standard used in the City of West Linn code aside from construction work hour restrictions. Refer to the Environ Noise Study Memorandum in Section 11 for information regarding typical sound levels. The City of West Linn requires construction work to occur during the work hours of 7 a.m. to 7 p.m. Monday through Friday and 9 a.m. to 5 p.m. Saturday.

4.4.1 HDD Construction

Environ estimated the potential common noise sources resulting from HDD construction activities within the OPRD property and associated truck trip volume. The HDD construction activity will result in operational noise levels that range from 61 to 69 decibels (dBA) at the immediately adjacent residents to the north and west of the HDD staging area. This noise level range is generated by HDD equipment that will be used continually throughout each work day. Additionally, some construction equipment used for the HDD construction process may produce intermittent noise levels that range from 62 to 79 dBA. Construction noise related to HDD construction activities will occur during the work hours of 7 a.m. to 7 p.m. Monday through Friday and 9 a.m. to 5 p.m. Saturday. The HDD pullback phase will require continual construction activities over a 24- to 48-hour period. The noise levels associated with the pullback phase are anticipated to be the same as for normal HDD operation; however, these noise levels are anticipated to occur during nighttime hours for pullback construction activities. A work hour variance will be requested from the City of West Linn to conduct HDD pullback work outside the normal working hours and additional mitigation will be provided as noted below.

Several mitigation factors are proposed to reduce construction noise at the OPRD HDD staging area site. These are included in the Noise Study Memorandum and include a 16-foot-high sound wall around the HDD staging area and acoustical blankets and enclosures around construction equipment. Noise modeling with these noise mitigation factors produced results in common or continual noise levels of 55 to 66 dBA and intermittent noise levels ranging from 65 to 72 dBA.

During the 24- to 48-hour pullback phase, the Partnership will relocate residents that live in homes immediately adjacent to the HDD staging area in the OPRD property. Relocating residents during this period will completely mitigate the largest construction impacts during this phase of HDD construction.

4.4.2 Mapleton Drive Open-Cut Construction

Construction noise was not modeled for open-cut construction work on Mapleton Drive since these construction activities will move at a rate of 50 feet per day with a maximum construction area length of 150 linear feet. All construction activities for the Mapleton Drive open-cut construction will occur during approved City of West Linn construction working hours (7 a.m. to 7 p.m. Monday through Friday and 9 a.m. to 5 p.m. Saturday). Implementation of the following noise mitigation measures will minimize noise impacts:

- Use ambient-sensing, broadband backup alarms in lieu of pure tone, single-level alarms or use flaggers/observers in lieu of backup alarms.
- Restrict the dumping of materials onto the ground, especially metallic or other hard materials. When possible, move/place materials with a crane or excavator rather than by dumping. This restriction does not apply to the dumping of excavated material into dump trucks or dumping of crushed rock onto the ground or into the pipe trench.
- Minimize banging tailgates, pipe noise, etc. with procedural methods or with the use of rubber gaskets.

- Conduct jackhammer work within a noise tent (jackhammer work is not currently anticipated at any point along Mapleton Drive since there is no rock present at the depth of pipeline installation).
- Prohibit rock blasting (blasting will not be allowed under any circumstances).
- Minimize idling of heavy mobile equipment and dump trucks. Turn off trucks or equipment when not in active use.
- Place stationary equipment as far from affected residences as possible.

4.4.3 Highway 43 Open-Cut Construction

Due to the dynamic nature of open-cut construction on Highway 43, a noise study was not conducted (the pipeline construction area will move at a rate of 50 feet per day with a maximum construction area length of 200 linear feet). However, Environ did evaluate potential measures to mitigate construction noise since this construction activity is required to occur during the nighttime hours of 8 p.m. to 5 a.m. A work hour variance will be requested from the City of West Linn to conduct nighttime work. Implementation of the following noise mitigation measures will minimize noise impacts during nighttime construction:

- Use ambient-sensing, broadband backup alarms in lieu of pure tone, single-level alarms or use flaggers/observers in lieu of backup alarms.
- Restrict the dumping of materials onto the ground, especially metallic or other hard materials. When possible, move/place materials with a crane or excavator rather than by dumping. This restriction does not apply to the dumping of excavated material into dump trucks or dumping of crushed rock onto the ground or into the pipe trench.
- Minimize banging tailgates, pipe noise, etc. with procedural methods or with the use of rubber gaskets.
- Conduct jackhammer work within a noise tent (jackhammer work is not currently anticipated at any point along Highway 43).
- Prohibit rock blasting(blasting will not be allowed under any circumstances).
- Minimize idling of heavy mobile equipment and dump trucks. Turn off trucks or equipment when not in active use.
- Place stationary equipment as far from affected residences as possible.
- Use portable noise barriers or enclosures around discrete, stationary equipment. Design barriers and enclosures based on the specific equipment and the placement of the equipment for which noise is to be controlled. A full noise enclosure should reduce noise from an individual source by 20 dBA or more.

4.5 Tree Protection Plan

An arborist report assessing the condition and vulnerability of trees along the pipeline route and required tree protection is provided in Section 7 of this land use application. Tree protection measures indicated in the arborist report will be incorporated into the contract documents to ensure that tree protection measures are installed prior to trench excavation or work within the vicinity of trees. The construction management team will have a full-time certified arborist available to observe, manage tree care, and direct the contractor on tree protection measures during construction to ensure that there are no impacts to trees along the alignment and staging areas as a result of the project.

4.6 Erosion Control

An Erosion Control Memorandum is included in Section 13 of this land use application The contractor will be required to use BMPs to minimize mud tracking on paved streets, in drainage systems, and on adjacent properties. Wheel washes and perimeter controls such as storm inlet protection and sediment fencing will be used where appropriate to prevent erosion and mud tracking. Additionally, the contractor will be required to implement secondary containment and spill prevention BMPs in areas where equipment mobilization and transport will occur so that measures are in place to prevent and effectively clean up any fuel spills.

4.7 Additional Mitigation

Potential construction mitigation measures will be discussed at a series of coordination meetings to be held with the neighborhood in July and August 2012. These meetings will be hosted by the City of West Linn and run by a facilitator retained by the City of West Linn. The Partnership is prepared to implement the potential mitigation measures listed below but believes further dialog with neighborhood representatives will likely help tailor the specifics of the final measures. The Partnership will work with the neighborhood and City of West Linn to implement any additional mitigation measures may be identified through these meetings.

- Require a dedicated construction worker to coordinate and provide residential driveway access at all times on Mapleton Drive and Highway 43. Residents could call the worker's cell phone to exit or enter their driveways when construction activities and the work area are immediately in front of their property. This will allow full access to residential driveways even when the construction area is directly in front of driveways and will preclude the need to restrict residential driveway access for one work period as discussed in Section 4.2.6. Requiring the contractor to coordinate with residents at this frequency may result in a longer construction period.

- Reduce weekday construction work hours for Mapleton Drive open-cut construction from 7 a.m. to 7 p.m. by 2 hours per day to 8 a.m. to 6 p.m. This will allow residents more flexibility to access driveways before and after normal commuting hours. Additionally, reducing work hours will decrease construction impacts during times when more residents are home. It is anticipated that changing work hours could increase construction work durations on Mapleton Drive by 20 percent.

- Impose a reduced speed limit of 15 miles per hour on Mapleton Drive to provide a safer pedestrian and bicycle environment. To be most effective, the speed limit would need to apply to both residents and construction workers and be enforced by the City of West Linn Police Department.

- Charter a vehicle to transport school children safely to the nearest bus stop who would normally walk along Mapleton Drive. Exact details of the chartered vehicle schedule and route could be developed at a later date in coordination with neighborhood residents and the West Linn-Wilsonville School District.

5. Conclusion

This document identifies the construction impacts and mitigation for the RWP and FWP projects within the City of West Linn. The Partnership recognizes that construction-related impacts are a concern for both West Linn and the neighborhood and is dedicated to the provisions identified herein and elsewhere in the application. The construction mitigation measures provided in this plan go beyond what would normally be done for a project of this nature to avoid and minimize construction impacts. The Partnership is looking forward to working with the neighborhood association, City of West Linn, and other agencies throughout the construction process to ensure a safe construction work area and to minimize construction impacts to the public.

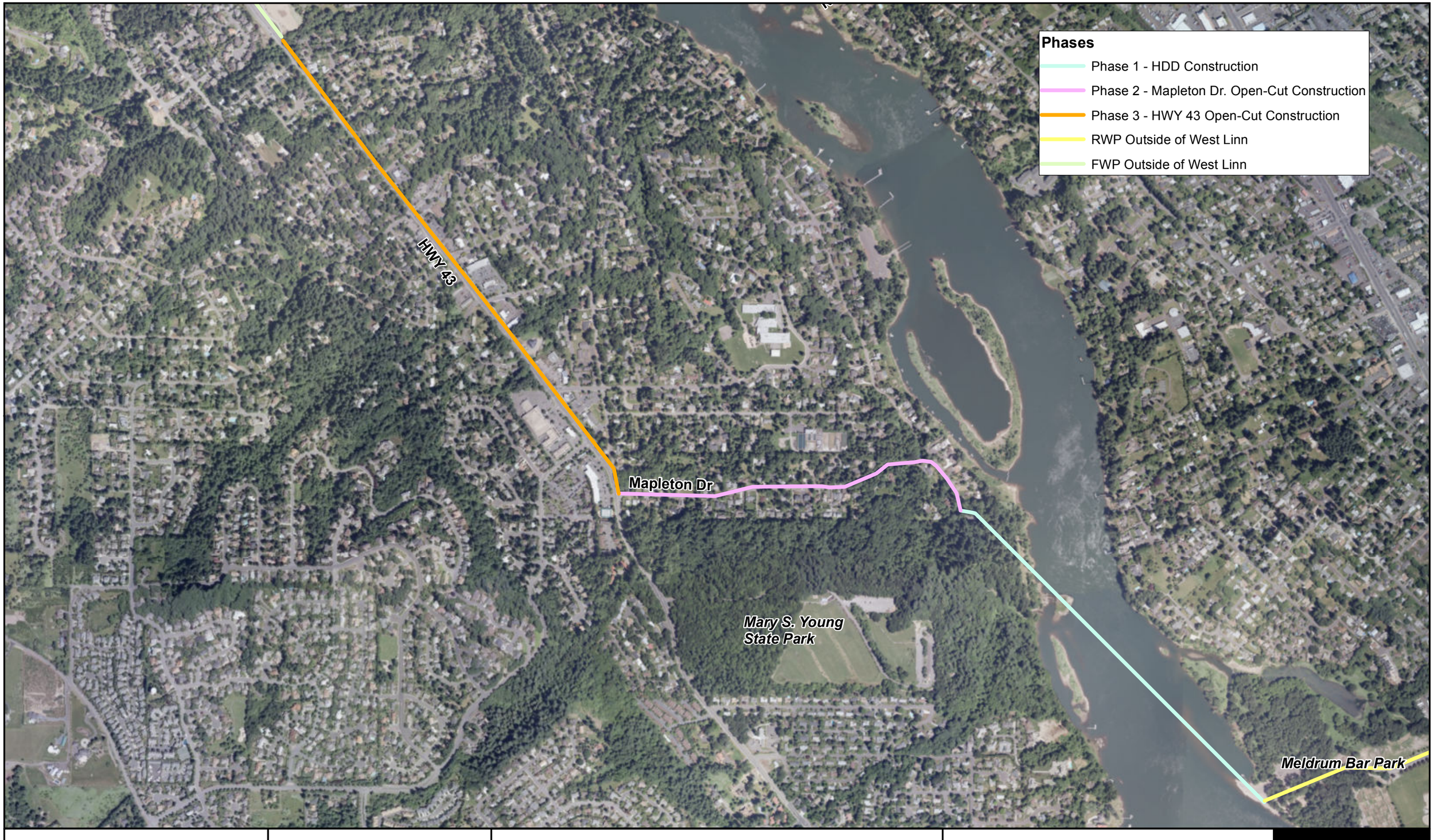
6. Attachments

Figures

Appendix A – ODOT Night Work Directive

Appendix B – TVF&R Correspondence

FIGURES



Lake Oswego · Tigard Water Partnership
sharing water · connecting communities

Figure 1

Proposed RWP and FWP Construction Phases West Linn

N

0 800 1,600 Feet

Brown AND Caldwell

SURFACE EASEMENT-
SURFACE IMPACT AREA

TRANSITION BETWEEN SUBSURFACE
AND SURFACE EASEMENT

TCE

BEGIN SCH 2

PE

DEPRESSION
6" ± DEEP

MAP 2 1E 24AC
2801

MAP 2 1E 24AC
200

METER ON POLE

MAPLETON DRIVE

EDGE OF
PAVEMENT

OPRD PROPERTY

WETLANDS
AS DELINEATED
BY DEA INC.
(TYPICAL)

32898

HDD SUBSURFACE
EASEMENT

MAP 2 2E 24AC
2900

MAP 2 1E 24AC
2800

MAP 2 1E 24AC
100

BOLLARDS

SIGN
"NO PARKING"

OPRD PROPERTY

NOTE: UNDERGROUND SANITARY LINE
LOCATION APPROXIMATE
NOT MARKED IN FIELD
DOWNSTREAM CONNECTION
AT EXISTING PUMP STATION

EDGE OF
PAVEMENT

MAP 2 1E 24AC
101
WEST LINN
SEWER PUMP STATION

NOTE: CLEANOUT LOCATION APPROXIMATE
SHOWN PER CITY ASBUILT MAPS
NOT FOUND IN FIELD

MAINTAIN
PEDESTRIAN
ACCESS TO
EXISTING TRAILS

MARY S YOUNG
STATE PARK

EXISTING

NOTE: W
FO
FIELD-L
SUPP

P:\cad\11\11191016.10_LOTWP-RawWtr\1-Sheets\03-Figures-RWR-Willamette_Boring(2)\Willamette_HDD_Bore_Sites(3).dwg STAN LASSELLE 3/26/2012 12:22

LEGEND

- **OPEN CUT PIPE ALIGNMENT**
- **HDD PIPE ALIGNMENT**
- **PE — PERMANENT EASEMENT**
- **TCE — TEMPORARY CONSTRUCTION EASEMENT**

N

0 15 30

APPROXIMATE SCALE IN FEET

Kennedy/Jenks Consultants

OPRD SITE DEVELOPMENT HDD STAGING AND PARK ACCESS

FIGURE 2

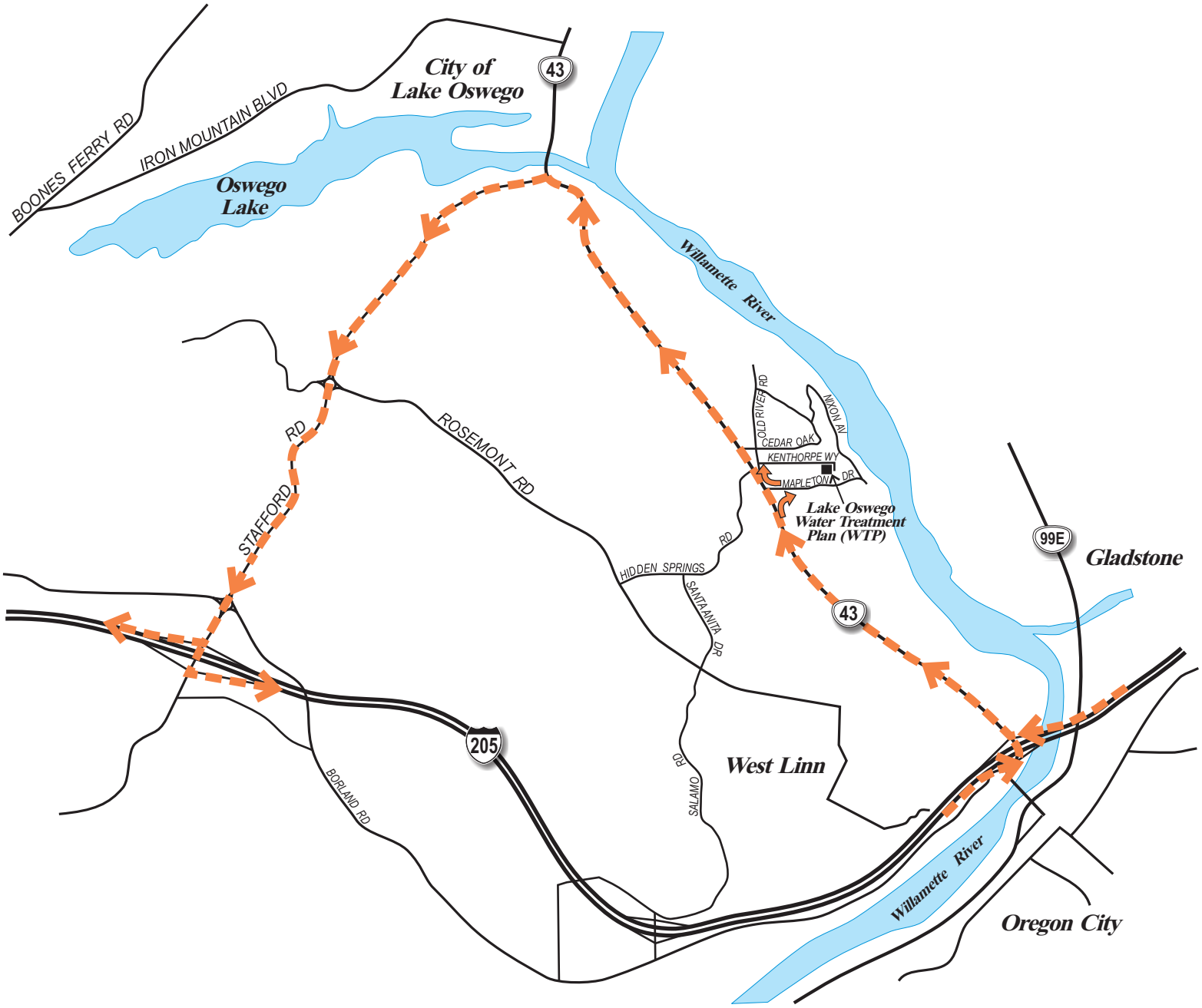
LEGEND

- From I-205 to Construction Area
- From Construction Area to I-205
- Signalized Intersection
- Prohibit Left Turn

DKS Associates
TRANSPORTATION SOLUTIONS

Figure 3

Construction Haul Route OR43 South



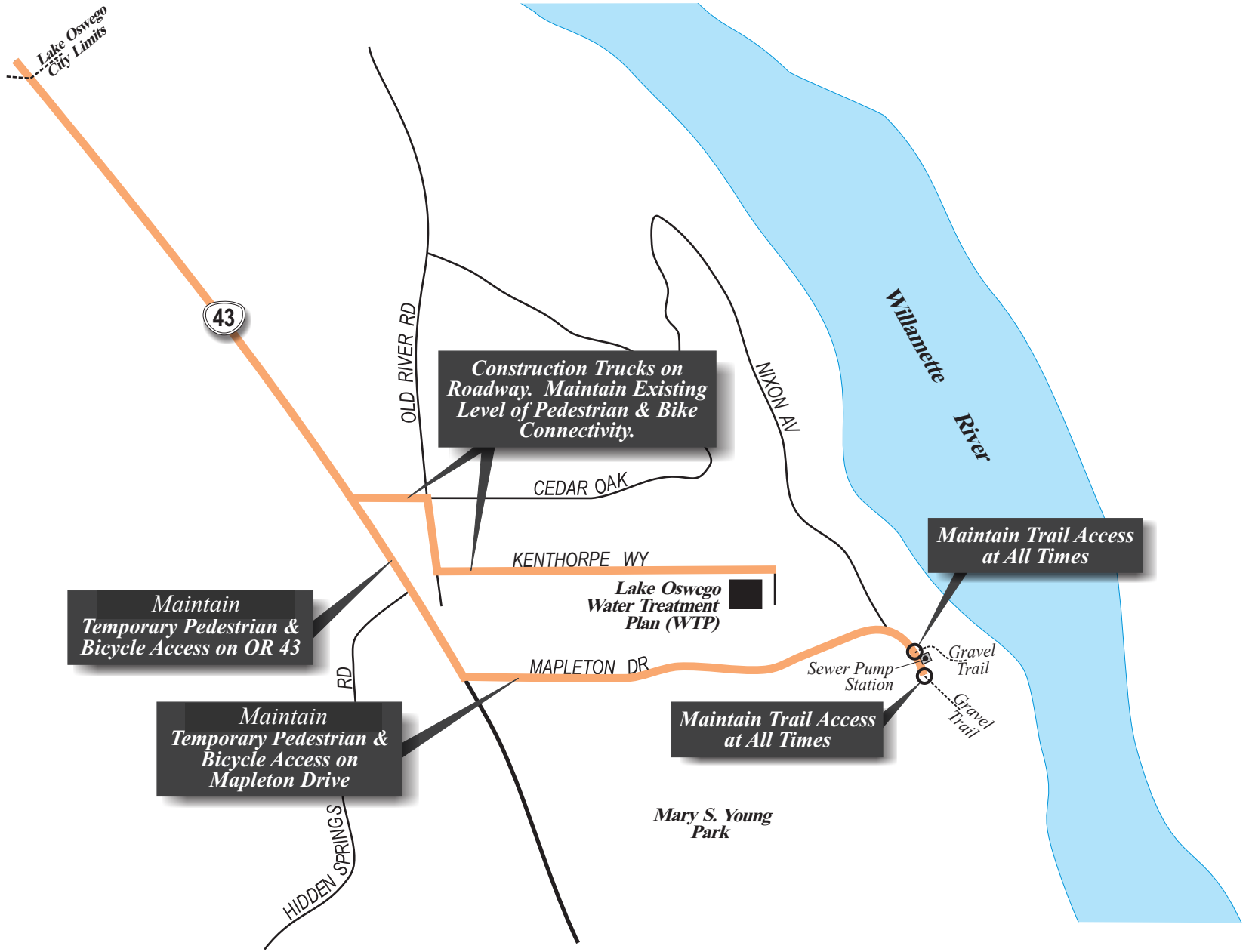
LEGEND

- To/From Construction Site

DKS Associates
TRANSPORTATION SOLUTIONS

Figure 4

Construction Haul Route OR43 to Stafford Road



LEGEND

- Roadways to be Impacted by Construction

DKS Associates
TRANSPORTATION SOLUTIONS

Figure 5

Pedestrian & Bicycle Circulation & Access Plan

APPENDIX A

ODOT Night Work Directive

Oregon
John A. Kitzhaber, M.D., Governor

Department of Transportation
District 2B Sylvan
6000 SW Rabb Road
Portland, Oregon, 97221-1302
Phone: (503) 229-5002
Fax: (503) 297-6058

April 3, 2012

FILE CODE:

RECEIVED
APR 05 2012
By

Joel Komarek
City Engineering Manager
City of Lake Oswego
PO Box 369
Lake Oswego, OR 97034

Joel,

In response to your question on the time of day for constructing the water pipe down Route 43, it has been our permitting practice on heavily traveled two lane highways to limit the work in the lane to periods of lower flow. To minimize the disruption to the traveling motorists and business along Route 43 we are limiting the work in the lane to start work at 8pm and be off the road open to traffic at 5am in the morning. We also expect the contractor to follow all local agency rules for work at night.

In response to your second question on the added supply trucks on Route 43, I asked Jess Brown from our Motor Carrier Unit his opinion. The email content is below underlined.

Hi Jess,

I have a permit coming up that involves construction of a 4 foot water pipe down Hwy 43 from West Linn to Tigard. A question came up on the increased supply truck traffic to and from the water treatment plant located at 4260 Kenthorpe Way in West Linn. The WTP is located approximately one half mile from Oregon Route 43. The expanded WTP will generate fewer than 20 new vehicle trips per week and will require approximately 1-2 chemical truck deliveries per week, roughly the same number as present. The quantity and type of chemicals are not substantially different from what has been coming to the site for the past 15 years. What is the highway rule on these trips?

Good Morning Bob,

The Oregon Department of Transportation adopts the Federal rules governing the transportation of Hazardous Materials. These rules have no restrictions from carrying hazardous materials in the area that is being discussed. All transporters of hazardous material must follow the rules in part 397 of the Federal Motor Carrier Safety Administration. The only restriction that I am aware of in the Portland area is on HWY 26 between I-405 and HWY 217. I have not heard anything from Clackamas County or the cities of West Linn or Lake Oswego.

Please let me know if you any other questions.
Jess

ODOT is not restricting supply trucks according to Federal, State and local rules.

Bob Ebeling
Assistant District Manager
District 2B Sylvan
503-229-5002

APPENDIX B

TVF&R Correspondence

Oveson, Pete

From: Mohling, Karen A. [Karen.Mohling@tvfr.com]
Sent: Friday, June 22, 2012 12:44 PM
To: Oveson, Pete
Subject: RE: LOTWP/TVF&R Meeting summary 6/7/2012

Pete,

I have circled back with Captain Halley and your summary is accurate.

The Captain does not feel the need for another meeting – his main concern is that the station, and the fire district, receive the daily email reports once work begins.

Thank you,

Karen Mohling
Deputy Fire Marshal
TVF&R
503-259-1512

From: Oveson, Pete [mailto:POveson@BrwnCald.com]
Sent: Wednesday, June 20, 2012 3:06 PM
To: Mohling, Karen A.
Cc: Aaron Eder; Eric Eisemann
Subject: LOTWP/TVF&R Meeting summary 6/7/2012

Hi Karen,

I am sending a summary of our meeting that was held on Thursday, 6/7/2012. The following people were in attendance: Karen Mohling, Eric Eisemann, Aaron Eder, and Pete Oveson.

Please respond and let me know if you have any comments or if you think that our meeting is adequately captured in this summary.

Thanks!

Meeting Summary:

We discussed the provided Traffic Plan, project coordination with TVF&R, and project benefits to TVF&R.

Traffic Plan

- The West Linn Land Use Application Traffic Memorandum prepared by DKS Associates was provided to TVF&R for review and comment.
- TVF&R does not have any comments regarding proposed Traffic Memorandum and felt that the proposed plan is reasonable and consistent with what is typically done for a construction project of this nature.
- TVF&R's Fire *and Life Safety Requirements for Department Access and Water Supplies* requires emergency response within 150 feet of any building for firefighting to enable the use of typical firefighting equipment. The project requirements that the contractor will immediately provide access to emergency vehicles in the work

zone and the work zone limit of 150 feet in length (on Mapleton Drive) are consistent with TVF&R's requirements.

TVF&R Coordination

- A subsequent meeting will be held with the Captain of the Bolton Fire Station to discuss any additional considerations to response time and project coordination (what is the best way to get this scheduled?).
- During project construction, TVF&R Stations 57, 58, and 59 (Mountain Road, Willamette, and Bolton) will notified via daily emails (we will need these email addresses at some point to include in the construction contract specs) of construction activities and location.
- TVF&R representatives will be invited to weekly construction safety coordination meetings. TVF&R has offered the use of the Bolton Station for these meetings; however, the contractor will make the ultimate decision regarding location of these meetings.

Project Benefits to Public Safety

- The Project can provide reliable emergency water (for firefighting) in the City of West Linn and other areas under TVF&R jurisdiction.
- The Project will increase emergency water reliability by replacing a deteriorating 6" asbestos cement water line (owned by the City of West Linn) in Mapleton Drive with a new 8" ductile iron water line.
- The Project will increase emergency water reliability and availability by upgrading and replacing fire hydrants connected to the City of West Linn water main in Mapleton Drive.
- During construction the Project will provide three ways to access homes at the end of Mapleton Drive:
    - Through the construction work area via a 12-ft wide emergency access lane described in the Traffic Memorandum.
    - Around the project work area via a detour on Cedaroak Drive and Nixon Avenue.
    - An emergency access road will available for TVF&R use through the Lake Oswego Water Treatment Plant site (i.e. emergency response can access Mapleton Drive via Kenthorpe Way).

Pete Oveson, P.E.
Brown and Caldwell
6500 SW Macadam Avenue Suite 200
Portland, OR 97239
poveson@brwncald.com
T: 503.977.6650 | **C:** 503.880.5837